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BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 41/91 - 3.5.1.

Application No.: 85 305 987.1

Publication No.: 0 172 755

Title of invention: An apparatus for an efficient coding of television signals

Classification:

D E C I S I O N
of 26 March 1992

Applicant: SONY CORPORATION

Proprietor of the patent:

Opponent:

Headword:

EPC Articles 54, 83, 84, 111(1)

Keyword: "Sufficiency of disclosure (confirmed)" -
"Lack of clarity (no) - missing features not essential" -
"Novelty (yes) - distinguishing feature can be identified" -
"Inventive step not yet examined - remittance to first instance department"

Headnote

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 41/91 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 26 March 1992

Appellant : SONY CORPORATION
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Decision under appeal : Decision of Examining Division 2.2.02.058 of the European Patent Office dated 10 August 1990 refusing European patent application No. 85 305 978.1 pursuant to Article 97(1) EPC.

Composition of the Board :

Chairman : P.K.J. Van den Berg
Members : W.B. Oettinger
E.M.C. Holtz

Summary of Facts and Submissions

I. The appeal contests the decision of 10 August 1990 of Examining Division 2.2.02.058 to refuse the European patent application No. 85 305 987.1 which had been filed on 22 August 1985 (publication No. 0 172 755).

The reason given for the refusal was that Claim 1 filed on 21 May 1990 lacked clarity (Article 84, second sentence, EPC).

That claim reads as follows:

" An apparatus for the efficient coding of television signals, the apparatus comprising;

memory means (3, 4, 5) adapted to store the pixel data from a plurality of previous fields of the television signal;

parameter generating means (1) for generating a set of parameters (w_1 - w_{35}) defining a linear combination of pixel data currently stored by the memory means (3, 4, 5), the linear combination being an approximation to the pixel data of the current field;

prediction means (2) for generating pixel data (I_k) of a predicted current field according to the linear combination, defined by the parameters of the pixel data stored by the memory means;

the parameter generating means being responsive to the pixel data (I_k) predicted by the prediction means to generate a set of parameters such that the error between the pixel data of the predicted current field and the pixel data of the actual current field is minimised; and

transmission means for transmitting the parameters (w_1 - w_{35})."

II. In a preceding communication, the Examiner had objected to a similar Claim 1 for the additional reason that, because of its general and obscure wording, it would also lack novelty against US-A-4 202 011 (hereinafter referred to as D1).

In the context of the initial Claim 1, which was more general, the Examiner had raised a further lack of novelty objection based on US-A-4 437 119 (D2).

The dependent claims were, in the Examiner's last communication, said to either (Claim 2) lack novelty against D1 or not appear to contain an inventive feature.

III. The appeal was lodged, and the respective fee paid, on 14 September 1990 with a statement that the decision is appealed in its entirety. The Statement of Grounds was filed on 10 December 1990.

IV. The Appellant requested that the appealed decision be set aside and Claim 1 on file (cf. point I above) be allowed (main request). As auxiliary requests he proposed that two separate amendments of Claim 1 be considered, or oral proceedings be held.

Reasons for the Decision

1. The appeal is admissible (Articles 106 to 108 and Rule 64 EPC).

2. In accepting Claim 1 on file (main request) for consideration, the Examining Division has silently assumed that the amendments made to the independent claim do not pose any problem under Article 123(2) EPC. For instance, the Division saw no such problem in the fact that the

originally termed "parameter identifying means" is now termed "parameter generating means".

The Board agrees with this finding.

3. The Examining Division's reason for refusal having been that Claim 1 constituting the Appellant's main request lacks clarity, this is the primary issue to be decided by the Board. Other issues will be dealt with afterwards.

4. Article 84 EPC

The requirement that "they shall be clear" (Article 84, second sentence, EPC) relates to "the claims" which shall, as their main purpose, "define the matter for which protection is sought" (Article 84, first sentence).

It is therefore clear that the requirement of clarity has more than one aspect: Claims shall not only be clear in the sense that the reader must be able to understand their words and (sub-)sentences but they shall furthermore be clear in their purpose of defining the matter sought to be protected. This latter requirement implies, for instance, that the claimed features must be suitable and, in toto, sufficient to achieve the intended effects or, in other words, to solve the underlying problem. In the Implementing Regulations this requirement is expressed by the supposition that an (independent) claim is "stating the essential features of an invention" (Rule 29(3) EPC).

On the basis of these general considerations, the Board will now deal with the issue of lack of clarity:

4.1 There is, apparently, no major problem with the language of Claim 1 (main request). The Examining Division seems to

have understood all its words and sub-sentences, and the Board has no difficulties either in this respect.

4.2 In the decision under appeal, no objection of lack of clarity was raised against the feature defining the "memory means".

The Board agrees with this approach. For instance, by implication, the term "previous" must be considered as meaning such fields (e g, the last three) that the intended function of the claimed apparatus, "efficient coding" for "transmitting" purposes, as stated in Claim 1 is ensured and thus the direct effect thereof, viz reducing the number of bits per pixel, i.e. compressing the amount of data to be transmitted (as expressly mentioned in the description, e.g. page 1, lines 3-4 and page 2, lines 9, 13 and 24) achieved.

4.3 A basic reason for the Examining Division to consider Claim 1 to be unclear seems to have been that it would not, even after amendment, specify "how and in what way said parameters define said linear combination".

The Board does not see, however, any lack of clarity in this respect.

A "linear combination of pixel data" will clearly be understood, by the skilled person, as a sum (possibly including negative terms) of the general formula $I_k = \Sigma(w_n \cdot I_{k-i})$. This sum is clearly "defined" by the coefficients (w). It appears therefore clear that the "set of parameters defining (the) linear combination" are the said coefficients.

In the opinion of the Board, this follows already from the wording of Claim 1 as read by the person skilled in the

art, and it would only be for the purpose of finding an additional confirmation that the skilled reader would refer to the description in this respect, for instance to the formula on page 9.

4.4 On the basis of the aforementioned reason (4.3), the appealed decision states that Claim 1 as amended "leaves it open as to what shape and structure said parameters are to possess".

This finding is understood as relating to the shapes of the windows (cf. Figures 3B to 3D) embracing the pixels whose data are stored and to the distribution of values for the coefficients (w) of the individual pixel data terms (cf. equation on page 9).

As to the shapes of the said windows, the skilled person will readily understand that rectangles as shown in Figures 3B to 3D (in Figure 3C, one of the circles indicating a pixel appears to be missing) would be very suitable (but not constitute a necessary condition).

As to the spatial distribution of the parameters, or coefficients, over said windows, the skilled person will readily understand that a distribution leaving no "holes" (cf. Figures 3B to 3D) would be very suitable (although not absolutely necessary).

If, however, individual parameter values are considered, these cannot, as a matter of logic, be specified in Claim 1 because they are variables. This follows from the fact that, as a result of the function of the claimed apparatus, the parameters are not predefined but generated in dependence upon an error minimising process so that they serve, when being transmitted, as the information carrying signals (cf. paragraph 4.5).

4.5 The appealed decision goes on to state that "therefore, it remains also obscure as to in what manner said parameter generating means are configured in order to generate said parameters".

With respect to this objection it is noted that Claim 1 states that the generation of the parameters is "such that the error between the pixel data of the predicted current field and the pixel data of the actual current field is minimised". In the opinion of the Board, this functional definition of the parameter generating means is sufficient for the purpose of defining how this means must be constructed.

From Claim 1 the following function - in the steady state, after a starting phase - can be understood:

Pixel data are predicted, according to a linear combination of neighboring pixels of previous fields as represented by a formula such as that on page 9 (assuming, for the moment, that the parameters or coefficients w are given). The predicted pixel data are compared with the actual pixel data received in the current field. The resulting difference, called error, is minimised, by changing the parameters, to zero. The changed parameters, containing information about changes, or movement, in the TV picture, are transmitted.

For a definition of this function, sufficient for the skilled reader to recognize how it could be implemented, it appears not necessary to define how the parameter generating means is "configured".

4.6 In countering a respective submission made by the Applicant, the appealed decision states that the original

disclosure only described one example for minimising the said error, namely a "method of least squares". This statement is correct.

From this fact it does not, however, necessarily follow that the skilled person would not know how to minimise the said error until he has read the description.

The Board has no doubt about the fact that the mathematical "method of least squares" belongs, as a matter of minimising an error, to the general knowledge of the person skilled in the art, taking into account that such a person must have some mathematical knowledge as well as a knowledge of electronics. He must therefore be regarded as being able to implement the error minimising function of the parameter generating means.

It is not relevant in this context whether the "method of least squares" is the only one applicable. The Board is inclined to accept the Appellant's submission that it is not the only one; but however this may be, in the present case the "essential" point is that the skilled person would be able to realise how the error minimising function can be implemented. The Board disagrees, for this reason, with the statement, in the decision under appeal, that the corresponding feature is "specific to the present invention and, consequently, has to be claimed in a clear and detailed manner".

In the opinion of the Board, it is not therefore necessary to further specify, or restrict, the claimed parameter generating means, for the sake of clarity, in the sense that it uses a method of least squares (which is the subject of dependent Claim 3).

4.7 Furthermore, the appealed decision states that "it remains obscure as to in what way the said error between the pixel data of the predicted current field and the pixel data of the actual current field is minimised".

This appears, in effect, to be the same objection as dealt with above (4.5), and the Board's conclusion is therefore the same.

4.8 The appealed decision goes on to say that it would not be clear from the amendment made "in which (way) said parameter generating means generate said parameters in order to define said linear combination of pixel data".

This statement appears correct but for the definition of the parameter generating means it suffices, as said before (4.5), to know that it must generate the set of parameters (in the form of, as a matter of course, electrical signals representing these parameters) but it is not essential how it performs this function.

4.9 The appealed decision adds that "the fact that said parameter generating means are responsive to the pixel data predicted does not suffice to clarify this point". This finding is based on the consideration that the amendment of Claim 1 "does not characterise as to what relationship exists between said parameters and said linear combination of pixel data".

However, the Board disagrees with this latter consideration and, consequently, with the finding based on it because, as said before (4.3), a correct reading of Claim 1 should also include what is implicit in it, namely that the parameters must be understood as coefficients in a weighted sum.

4.10 Summarising the Examining Division's findings, the decision considered the feature relating to the error minimising function of the parameter generating means to be "a statement of effect or an object to be achieved without specifying the technical feature(s) by which this object or effect is achievable".

While this statement is not completely wrong, it is not the whole truth either. As pointed out above (4.5 and 4.6), the said feature is a functional feature which it is justified not to restrict any further in the sense of a particular method to be used for minimising the prediction error.

4.11 For these reasons, Claim 1 is considered to meet the requirement of clarity and those mentioned in Article 84 EPC as a whole.

5. Article 83 EPC

The ground for rejecting Claim 1 as lacking clarity (Article 84 EPC) was the absence of features which the Examining Division thought were essential to the invention.

If these features were not only absent from Claim 1 but missing in the other application documents as well, this would have allowed, in addition to the objection under Article 84 EPC, an objection under Article 83 EPC that the application does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a skilled person.

Such an objection would have been more serious than the objection actually made, and therefore it should have been made. However, it was not made by the Examining Division.

It follows therefrom that an objection of insufficiency appeared not justified to the Division.

The Board agrees with this view. It appears credible that the error minimising feature is feasible, (either only or not only) by using the "method of least squares", and that it leads to the set of parameters containing information about the changes, or movement, in the TV picture.

6. Article 54 EPC

Even though non-conformity with Article 84 EPC was the only reason, given in the decision under appeal, for refusing the application, it is clear from the Examiner's communication that he was of the opinion that the then Claim 1, which was similar to the one now on file, was so broad as to be anticipated by D1.

The Board deems it, therefore, appropriate to deal also with the issue of lack of novelty.

6.1 In his Communication dated 9 March 1990, paragraph 1(c), the Examiner showed - correctly, in the Board's opinion - that the feature in Claim 1 relating to the "memory means" is known, in the same context (opening phrase of Claim 1), from D1.

6.2 Having done this, the Examiner stated that "thus, US-A-4 202 011 likewise appears to disclose an apparatus for the efficient coding of television signals, comprising ..." (using the language of Claim 1).

He furthermore explained that, in D1, the linear combination is a difference obtained by subtractors 103, 107.

6.3 According to the "Abstract" and the "Summary" of D1, in the known television signal coder a predicted signal level for each picture element, b_{jk}, is represented by an interpolated value, viz. the arithmetic mean $(a_{jk}+c_{jk})/2$, of the respective spatially corresponding picture elements in the preceding (a) and succeeding (c) fields. The difference, b-(a+c)/2, between the interpolated value and each corresponding picture element, i.e. the prediction error, is coded and transmitted.

In the opinion of the Board, the so explained subject-matter of D1 cannot be read on Claim 1 on file, viz. on all of its features, as will now be shown in detail.

6.4 It is true that the mean value (a+c)/2 constitutes an "approximation to the pixel data of the current field"; it is further true that this value is constructed as a linear combination, viz. a sum, of pixel data (a, c) stored by the memory means, i.e. stemming from previous fields of the TV signal, and it is finally true that this linear combination is multiplied by a coefficient ½ which could be called "parameter".

It is nevertheless arguable whether the first of the two features in Claim 1 relating to the "parameter generating means" can fully be read on D1: The coefficient always being ½, no real "set" of coefficients, or parameters, is generated.

6.5 It is also true that the known apparatus comprises "prediction means" as defined in the respective feature of Claim 1: The mean value (a+c)/2 constitutes "pixel data of a predicted current field" in the sense of this feature.

6.6 It is furthermore true that, in D1, the difference b-(a+c)/2 constitutes an "error between the pixel data of

the predicted current field and the pixel data of the actual current field".

For the rest, however, the second of the two features in Claim 1 relating to the "parameter generating means" cannot be read on D1: According to that citation, the said error is not "minimised" but transmitted.

In contrast, in the claimed apparatus, the prediction error is minimised, i.e. reduced to (at least approximately) zero, by changing the parameters, i e the coefficients of the linear combination (cf. paragraph 4.3), which will therefore not be constants such as is the factor ½ of the citation. Furthermore, it is this set of parameters, modified by the error minimisation process, which is transmitted rather than the prediction error.

6.7 Finally, the apparatus of D1 comprises transmission means but, other than those mentioned last in Claim 1, these are used for transmitting the error signal, b-(a+c)/2, and not a set of parameters constituting the coefficients of the linear combination as modified by an error minimising process.

6.8 The subject-matter of Claim 1 is therefore clearly new against D1.

6.9 The same conclusion can be drawn with respect of D2 cited by the Examining Division only against the initial, apparently broader, version of Claim 1.

This conclusion does not, however, require any detailed argumentation.

It suffices to state that in the apparatus of D2 it is also the error signal (obtained in subtractor 2, Figure 2)

that is transmitted and not a set of parameters constituting coefficients of a linear combination modified by an error minimising process.

6.10 For these reasons, the subject-matter of Claim 1 is considered to be new.

7. Conclusions

7.1 The Appellant's main request that the decision under appeal be set aside is therefore to be allowed because:

- the Examining Division's ground for refusing the patent application has been found not to be valid, and

- the further objection, made during the first instance procedure, lack of novelty, does also not apply.

7.2 The Appellant's auxiliary requests need not, therefore, be considered.

7.3 The patent application is not, however, ready for grant of a patent because:

- the subject-matter of Claim 1 has not, so far, been examined as to the other requirements for patentability, in particular whether it involves an inventive step, and

- the other application documents have not been examined as to whether they comply with the provisions of the Convention.

In respect of this latter requirement, reference is made in particular to:

- Rule 27(1)(b) (version of 1.6.1991) in view of the indication of the background art, and

- Rule 27(1)(e) in combination with 34(1)(c) in view of statements (page 16, last paragraph) which are partly unnecessary and partly objectionable for the more serious reason that it is not one of the purposes of the description to indicate how broad the claims should be interpreted.

7.4 Both the inventive step examination and the examination as to the further requirements will, in the opinion of the Board, best be done by the first instance department.

The Board finds it therefore, and in order not to deprive the Appellant of a two instance procedure in respect of these possible issues, appropriate to make use of its power to remit the case to the Examining Division for further prosecution rather than to deal with these matters itself (Article 111(1) EPC).

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 department for further prosecution on the basis of the Appellant's main request (cf. paragraph IV).

The Registrar: The Chairman:

M. Beer P.K.J. van den Berg

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