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File No.: T 0630/93 - 3.5.1
Application No.: 89 302 118.8
Publication No.: 0 331 502
Classification: HO4N 5/232
Title of invention: Focus control apparatus and methods

D E C I S I O N
of 27 October 1993

Applicant: Sony Corporation

Proprietor of the patent:

Opponent:

Headword:

EPC: Art. 84

Keyword: "Clarity (yes)"

Headnote
Catchwords



Case Number: T 0630/93 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 27 October 1993

Appellant: Sony Corporation
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Decision under appeal: Decision of the Examining Division of the
European Patent Office dated 3 March 1993 refusing
European patent application No. 89 302 118.8
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: P.K.J. van den Berg
Members: R. Randes
G. Davies

Summary of Facts and Submissions

- I. European patent application No. 89 302 118.8 (publication No. 0 331 502), filed on 3 March 1989, was refused by a decision of the Examining Division dated 3 March 1993.

The decision was based on Claims 1 to 6 filed on 30 December 1992, of which the Claims 1, 5 and 6 were independent. The independent Claims 1 and 5 read as follows:

1. Focus control apparatus for a video camera in which a component of a video signal is maximised for performing focus control, the apparatus comprising:
means (5A, 5B) for extracting a signal having a predetermined frequency component from a video signal;
means (2) for moving a position of a lens (1) of the camera; and
means (8, 9) for sampling the signal of predetermined frequency component extracted from the video signal at continuous, successive at least first, second, and third lens positions ($1m$, $1m+1$, $1m+2$);
characterized by:
means (10) for determining a first gradient (θ_0) in response to a change in value of the signal of predetermined frequency component for a change in lens position between said first and second lens positions ($1m$, $1m+1$) from the signal of the predetermined frequency component sampled at the first lens position ($1m$) and the signal of the predetermined frequency component sampled at the second lens position ($1m+1$);

means (10) for determining a second gradient (θ_1) in response to a change in value of the signal of predetermined frequency component for a change in lens position between said second and third lens positions ($1m+1$, $1m+2$) from the signal of the predetermined frequency component sampled at the second lens position ($1m+1$) and the signal of the predetermined frequency component sampled at the third lens position ($1m+2$); and

means (11) for controlling the speed of movement of the lens (1) at said successive lens positions in response to a comparison of said first and second gradients (θ_0, θ_1).

5. A method of focus control for a video camera wherein a video signal level from the camera is maximised by movement of the lens (1) through continuous positions to the in-focus position, the method comprising the steps of:
extracting (5A, 5B) a signal having a predetermined frequency component from the video signal; and
sampling (8, 9) the extracted signal at at least three successive points corresponding to three respective lens positions ($1m$, $1m+1$, $1m+2$);
characterized by:
deriving (10) a first gradient (θ_0) indicative of a change in value between said extracted signal at a first sample point and a second sample point;
deriving (10) a second gradient (θ_1) indicative of a change in value between said extracted signal at said second sample point and a third sample point;
comparing the first and second gradients (θ_0, θ_1);
and controlling the speed of movement of the lens (1) at said successive lens positions in response to the comparison.

II. The grounds of refusal were that

1) the application lacked unity within the meaning of Article 82, since the Claims 1 to 5 on the one hand and the Claim 6 on the other hand did not relate to a single inventive concept.

2) the independent claims did not meet the requirements of Article 84 EPC. With regard to Claims 1 and 5 it was stated:

"The term "in response to a comparison" is vague and indefinite, so that the function of the "means for controlling the speed of movement..." is not clearly defined. The manner in which the gradients are compared and the manner in which the means responds to the result of comparison remain undefined. Consequently, it is not apparent how the problem indicated at pages 3 and 4 of the description can be solved with the apparatus and method claimed in Claims 1 and 5 respectively."

In contrast to the Applicants, who argue that a precise definition in this respect is unnecessary, the Examining Division is of the opinion that a precise definition is indispensable for a clear technical teaching."

3) the subject-matter of all the independent claims lacked an inventive step having regard to the teaching of D1 (EP-A-0 092 850).

III. A notice of appeal was filed against this decision on 22 April 1993 and the appeal fee was paid on the same day. A Statement of Grounds of Appeal was submitted on 3 July 1993.

IV. The Appellant filed a main request and two auxiliary requests and a conditional request for oral proceedings. In order to overcome the unity objection the Appellant in all requests had deleted Claim 6 as refused.

According to the main request the Appellant requested that the decision under appeal be set aside and a patent granted on the basis of the following documents:

Claims: 1 to 5, filed on 30 December 1992;

Description: pages 1 to 3 and 7 to 16 as originally filed, page 6 filed on 30 December 1992, pages 4 and 5 as filed with the Statement of Grounds of Appeal;

Drawings: sheets 1/7 to 7/7 as originally filed.

In his argumentation the Appellant disputed that Claim 1 was unclear. He submitted that it was not necessary to specify the precise nature of the comparison of the successively calculated gradients in order to render the claims clear. On the contrary, the skilled man would appreciate that the variation of the lens speed in proportion to the ratio of two successive gradients is merely a preferred embodiment of the invention. For example, the skilled man would appreciate that a calculation of the difference between successive gradients could be employed instead of a calculation of the ratio of said gradients. A limitation of the claims to a calculation of the ratio of successive gradients would deny the Applicant a fair protection for his invention.

Also, the Appellant contested the Examining Division's view that Claims 1 and 5 lacked an inventive step having regard to the teaching of D1. He stated that D1 disclosed a number of embodiments, it was, however, neither disclosed nor suggested therein that the speed of movement of the lens could be controlled in response to a comparison of successive gradients of the predetermined frequency component. On the contrary, in D1 the speed of lens movement was subject to only a two-stage control.

Reasons for the Decision

1. The appeal is admissible.
2. The unity objection against the application has been removed, since refused Claim 6 has been cancelled.
- 3.1 Turning to the main request which comprises Claims 1 to 5, as refused in the appealed decision, the Board notes that according to Article 84 EPC, first sentence, in a European patent application "the claims shall define the matter for which protection is sought". Therefore the primary function of a claim is to set out the scope of protection sought for an invention. This implies that it is not always necessary for a claim to identify technical features or steps in all detail. Thus, the Board cannot agree with the Examining Division's decision where it is stated (cf. under II.2 above) that

"it is not apparent how the problems indicated at pages 3 and 4 of the description can be solved with the apparatus and method claimed in Claims 1 and 5 respectively. the Examining Division is of the opinion that a precise definition is indispensable for a clear technical teaching".

The Board considers that it is sufficient if the application as a whole (claims, description and drawings) describes the necessary characteristics of an invention (in this case the control of the speed) in a degree of detail such that a person skilled in the art can perform the invention. This requirement, however, relates to Article 83 EPC and is not relevant to Article 84.

3.2 The second sentence of Article 84 EPC requires that the claims "shall be clear and concise and be supported by the description". This means that a claim must be clear

- a) in the sense that it uses a language that is clear and avoids giving rise to misinterpretations of its wording and moreover
- b) it must be supported by the description.

The requirement (b) has in the proceedings before the Boards been so interpreted that all features described in the description as being necessary for the performance of the invention (essential features) must be present in a corresponding claim (cf. T 32/82, O.J. 8/1984, 354-356). Thus features that are necessary to solve the technical problem concerned must be present in the claim. During proceedings before an Examining Division, it often happens that pertinent documents are cited with the result that the core of a claimed invention has to be changed and also the corresponding problem to be solved appears in a modified form. In such cases often new essential features must be added to the claim. With the aid of such new features, the changed solution or an additional effect is identified by the claim.

When interpreting said requirement (b) it must, however, be kept in mind, that the main purpose of a claim is to set out the scope of protection sought for an invention (see the first paragraphs of this reason). Therefore, the function of the essential features, although they normally are expressed in technical terms, is often to define the borders of an invention rather than to define the invention in detail within the borders. The detailed definition is normally made by the additional features, which may concern specific embodiments of the invention, in dependent claims appended to the main claim. Thus, essential features often can be of a very general character, in extreme cases they could indicate only principles or a new idea. The degree of generalisation is, however, always dependent on the prior art which has been disclosed.

3.2.1 The Board in the present case finds that Claim 1 clearly meets the requirement (a) cited above. Thus, the language is clear and can scarcely be misinterpreted.

3.2.2 The Board considers that the requirement (b) is also met.

As explained above, when deciding upon how much detail concerning an invention must be identified in a claim in order to meet requirement (b), it is necessary to relate the invention to the prior art. The Examining Division, itself, in the decision refusing the application has reached the correct conclusion that the subject-matter of Claim 1 differs from the most relevant state of the art (D1) in that "first and second gradients are determined, and in that a comparison between these gradients is used for controlling the speed of movement of the lens". Nor do, apparently, other documents known to the Examining Division disclose such a teaching or important parts of such teaching.

To the Board, therefore, it appears that the application, in fact, discloses a new principle. It has thus not been shown that it is known to determine successive gradients as proposed by the Appellant. Therefore, a claim having a broad scope is justifiable. It is not necessary to identify in detail in which way the said comparison or said speed control is performed. The skilled person will get this information from the description (e.g. corresponding to Figure 6), where a preferred embodiment of the invention is described. However, as has been suggested by the Appellant, the skilled person realises that also other ways of comparison and speed control within the borders of Claim 1 would be possible.

It is true that the features of Claim 1 do not in a compulsory way lead to the solution of the problem indicated in the description, i.e. that the overrun amount is reduced by a gradual reduction of the speed. However, the features indicated in the claim give the skilled person the possibility to perform such a control in a manner that leads to that result. Thus, in fact, the objective problem to be solved appears to be more general than indicated in the description, e.g. to achieve an almost continuous and graduated speed control. To establish such a generalised objective problem appears, however, in this case to be of only academic interest. Having regard to the description, it is in any case apparent for the skilled person how to control the apparatus in order to achieve the best effect when this focus control apparatus is used.

4. The Board agrees with the Appellant in that the speed of the lens movement according to the most relevant example in D1 (corresponding to Figures 14 and 15 and referred to by the Examining Division) is subjected to a two-stage control, i.e. an open loop control is used

until a lens position near to the position of correct focus is reached. A fixed voltage $\pm V_m$ controls the movement (and the direction) up to this position, apparently at a constant speed. When a reference level on an extracted signal function has been reached, a closed loop control of the movement starts. How this closed loop control is performed is not explained in D1.

The Board agrees with the Examining Division that it belongs to the general knowledge of a person skilled in the art that the gradient of a function decreases at positions near or at the maximum of the function. However, the Board does not agree that it would be obvious to a skilled person having regard to the teaching of D1 to determine successive gradients of the signal having a predetermined frequency component and to control the speed of movement in response to a comparison between successive gradients as according to Claim 1.

As has been hinted above, the Board is of the opinion that the Appellant, in fact, has introduced a new principle in controlling the speed of the movement of a lens, whereby the speed can be continuously and gradually reduced and the overrun minimised. Neither D1, nor the other two documents cited in the European Search Report, namely the abstracts from

PATENT ABSTRACTS OF JAPAN, volume 10, No. 50
(E-384)/2107/, 27 February 1986; JP-A-60 204 181
(RICOH K.K.) 15-10-85 and

PATENT ABSTRACTS OF JAPAN, volume 10, No. 197
(E-418)/2253/, 10 July 1986; JP-A-61 41 277 (MATSUSHITA
ELECTRIC IND CO LTD) 27-02-1986

disclose or hint that it would be known or obvious to determine said gradients and to use the result as proposed by the invention. Both documents show that only the amplitude of said signal is measured. Nor has it been shown that the determination of such gradients would be known in a neighbouring technical field and for a similar purpose.

The Board, therefore holds that the subject-matter of Claim 1 is not obvious over the cited prior art and thus involves an inventive step.

5. The dependent Claims 2 to 4, which only relate to preferred embodiments of the apparatus claimed in the independent Claim 1, are also acceptable.
6. The independent Claim 5, which is a method claim and corresponds to the independent apparatus Claim 1, is allowable for the reasons 2 to 4, above, relating to Claim 1.
7. Therefore, the claims being clear and their subject-matter being novel and implying an inventive step, a European patent may be granted on the basis of the present European patent application, in accordance with the main request.
8. Having regard to the fact that refused Claim 6 has been deleted, it appears that the part of the description concerning Figure 8 does not any longer belong to the invention as identified by the appended claims. It appears, therefore, that this part must be deleted or it must be made clear in the description that this part does not belong to the claimed invention (cf. Guidelines, C-III, 4.3 (c)).

9. A decision in favour of the Appellant on the basis of the main request satisfies the Appellant's request to cancel the decision. His auxiliary requests do not need to be considered.

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 on the basis of the main request (see paragraph IV above) with particular attention being paid to correction of the deficiencies mentioned in paragraph 8 above.

The Registrar:

The Chairman:

M. Kiehl

P.K.J. van den Berg

