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Datasheet for the decision of 5 September 2006

Case Number: T 1316/05 - 3.5.04

Application Number: 98952953.2

Publication Number: 0965225

IPC: H04N 5/243

Language of the proceedings: EN

Title of invention:
Dynamic range modification

Applicant:
ROBERT BOSCH GMBH

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 84

Keyword:
"Claims - clarity and support by description (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 1316/05 - 3.5.04

D E C I S I O N
of the Technical Board of Appeal 3.5.04
of 5 September 2006

Appellant: ROBERT BOSCH GMBH
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 22 July 2005 refusing European application No. 98952953.2 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: F. Edlinger
Members: A. Dumont
J. Willems

Summary of Facts and Submissions

I. An appeal was lodged by the applicant against the decision to refuse European patent application No. 98 952 953.2, filed as an international application and published as WO 99/29101 A2.

II. Oral proceedings before the board took place on 5 September 2006, in the course of which the appellant withdrew all previous requests filed in preparation for the oral proceedings and submitted a new set of claims 1 to 5.

III. The appellant requested that the decision under appeal be set aside and that the case be remitted to the first instance for further prosecution on the basis of a new main request.

IV. The independent claims read as follows (features which have been added or modified with respect to the claims on which the decision under appeal is based are set in italics):

"1. A dynamic range *compression* circuit (DRCS) comprising:
means (LPF) for selecting a brightness component (B) *and means (HPF) for selecting a color component (C)*, from a sensor output signal (SS) containing said brightness component (B) and said color component (C), whereas the brightness component (B) and the color component (C) occupy different places in the frequency domain;

means (NLP) for non-linearly compressing said brightness component (B) to provide a compressed brightness signal (B’); and
output means (A; CC, GC2) for furnishing a *compressed* signal (CS) in dependence upon said *compressed* brightness signal (B’) *by adding said compressed brightness signal (B’) and said color component (C) or a gain-adjusted color component (C') to each other*."

"5. A dynamic range *compression* method (DRCS) comprising:
selecting (LPF) a brightness component (B) *and selecting (HPF) a color component (C)*, from a sensor output signal (SS) containing said brightness component (B) and said color component (C), whereas the brightness component (B) and the color component (C) occupy different places in the frequency domain;
non-linearly *compressing* (NLP) said brightness component (B) to provide a compressed brightness signal (B’); and
furnishing (A; CC, GC2) a *compressed* signal (CS) in dependence upon said *compressed* brightness signal (B') *by adding said compressed brightness signal (B’) and said color component (C) or a gain-adjusted color component (C') to each other*."

Claims 2 to 4 are dependent on claim 1.

V. The examining division held in the decision under appeal that the independent claims then on file did not meet the requirements of Article 84 EPC. It was unclear what kind of non-linear processing was performed to obtain a modified dynamic range. The relationship between the dynamic range modification, the non-linear

processing of the brightness component of a sensor signal and the furnishing of a modified signal was vague and did not specify how the non-linear processing of the brightness component affected the modified signal and how the modified signal served to provide the dynamic range modification (of what?). This cast unacceptable doubt on the extent of protection sought.

The examining division further commented in the decision under appeal that, although a lack of novelty of the claimed subject-matter was not a ground for refusal, the wording of the independent claims was so vague that the claims could be read onto a (known) video camera connected to a colour television through a composite video interface. A similar comment, relating to the prior art known from all the documents cited in the search report, had been made in the single communication of the examining division.

VI. The appellant mainly argued that the amended claims were now limited to the embodiments shown in figures 4 to 6. A colour and a brightness component were selected from the sensor output signal, the brightness component was non-linearly compressed and then combined with the colour component to provide a modified signal at the output of the dynamic range compression circuit. The invention was not necessarily limited to the analogue dynamic range compression of a sensor signal which was described as particularly advantageous in the description, page 2, lines 24 to 28, since a digital pre-processing would also yield similar benefits by allowing a subsequent digital processing of a signal with a lower bit depth and hence the use of cheaper circuits.

Reasons for the Decision

1. *Amendments*

Compared to the independent claims 1 and 6 as originally filed, the independent claims 1 and 5 respectively specify that the brightness and colour components (B, C) occupy different places in the frequency domain (see page 2, lines 29 to 31 of the application as published).

The original expression "non-linearly processing" the brightness component has been replaced in the present claims 1 and 5 by the more specific "non-linearly compressing" (see, for instance, page 4, lines 25 to 28 of the application as published).

The feature "adding said compressed brightness signal (B’) and said color component (C) or a gain-adjusted color component (C') to each other" is disclosed in figures 4 to 6, showing an adder (A) combining the signal (B') with either the signal (C) or the gain-adjusted signal (C').

The amendments therefore satisfy Article 123(2) EPC.

2. *Article 84 EPC*

2.1 Clarity

Claims 1 and 5 relate to a dynamic range compression circuit and method, respectively. The dynamic range of

an input sensor signal is compressed in that a brightness component of the sensor signal is selected and non-linearly compressed prior to being added to a selected (and possibly gain-adjusted) colour component of the sensor output signal in order to furnish a compressed (sensor) signal. Non-linear compression is a well known technique for dynamic range compression of camera sensor signals, as is evident from the introductory part of the description (see in particular page 1, lines 6 to 16) discussing the "knee characteristic" of the prior art. Since claims 1 and 5 now establish a clear relationship between the input and output sensor signals and specify a non-linear compression of a selected component (brightness, occupying a different place in the frequency domain from the colour component; see also figure 3), the processing of the sensor output signal to achieve the desired effect of dynamic range compression is clearly set out in the claims. As a result, the reasons in the appealed decision no longer apply to the amended claims.

2.2 Support by the description

The independent claims are not limited to dynamic range compression of an analogue sensor signal prior to analogue-to-digital conversion, which is described as particularly advantageous over the prior art (see the description, page 2, lines 24 to 28). However, the board has no reason to doubt that the circuit and method of claims 1 and 5 may prove advantageous also if the dynamic range modification takes place after analogue-to-digital conversion in that this would yield a compressed signal that could be represented by less bits. The board is therefore satisfied that the claims

are sufficiently supported by the description in that the degree of generalisation of the claims is such that the subject-matter as claimed achieves at least some of the technical effects which are disclosed to a person skilled in the art.

2.3 In conclusion, the amended claims comply with Article 84 EPC.

3. *Remittal*

Since non-compliance with Article 84 EPC was the only ground for refusing the present application and since the reasons given in the appealed decision do not apply to the substantially limited claims, the decision under appeal has to be set aside. The cursory comments on novelty in the decision under appeal (and in the single communication of the examining division) have to be understood as demonstrating, on the part of the examining division, the vague definition of the matter for which protection was then sought. They do not contain verifiable facts to substantiate this objection, without further investigations, against the new claims 1 to 5. Since the claims have been significantly changed with respect to the subject-matter on which the decision under appeal was based and since no full examination of the application as to patentability requirements has been carried out by the examining division, the board decides in accordance with the appellant's request that the case be remitted to the examining division pursuant to 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 for further prosecution.

The Registrar The Chairman

D. Sauter F. Edlinger