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**D E C I S I O N**  
**of 11 May 2000**

**Case Number:** T 0293/98 - 3.5.1

**Application Number:** 92301527.5

**Publication Number:** 0501723

**IPC:** H04N 5/232

**Language of the proceedings:** EN

**Title of invention:**

Image sensing apparatus provided with a plurality of automatic adjustments using common signal paths

**Applicant:**

CANON KABUSHIKI KAISHA

**Opponent:**

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**Headword:**

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**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

"Inventive step (no)"

**Decisions cited:**

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**Catchword:**

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**Case Number:** T 0293/98 - 3.5.1

**D E C I S I O N**  
**of the Technical Board of Appeal 3.5.1**  
**of 11 May 2000**

**Appellant:** CANON KABUSHIKI KAISHA  
30-2, 3-chome  
Shimomaruko  
Ohta-ku  
Tokyo 146 (JP)

**Representative:** Beresford, Keith Denis Lewis  
BERESFORD & Co.  
High Holborn  
2-5 Warwick Court  
London WC1R 5DJ (GB)

**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 28 October 1997  
refusing European patent application  
No. 92 301 527.5 pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** P. K. J. van den Berg  
**Members:** R. S. Wibergh  
V. Di Cerbo

## Summary of Facts and Submissions

- I. This appeal is against the decision of the Examining Division to refuse European patent application No. 92 301 527.5.
- II. The Examining Division argued that the invention was obvious having regard to the document
- D2: DE-A-3 320 690.
- III. On 25 November 1999 the appellant filed a set amended claims. Claim 1 read as follows (omitting the reference signs):

An image signal processing apparatus comprising:

- signal processing means for processing an image sensing signal generated by image sensing means to generate an output video signal;
- a plurality of pre-processing means for generating on the basis of the image sensing signal a plurality of different pre-process signals to be used to control respective parts of said image sensing apparatus; and characterised in that
- said image processing apparatus further comprises a microprocessor interface for receiving signals from a computer circuit to cause said plurality of pre-processing means to selectively output said pre-processed signals to said external computer via a common signal bus in response to signals from said microprocessor interface so that said computer circuit can generate control signals for controlling the image signal processing apparatus; and
- wherein said signal processing means, said pre-processing means and said microprocessor interface are

mounted on a single integrated circuit chip.

Claims 2 to 4 were depending on claim 1.

Oral proceedings before the Board were held on 11 May 2000. The appellant explained that claim 3, directed to a camera "according to claim 2" should in fact be understood as directed to a camera including the image signal processing apparatus according to claim 2. It was argued that the invention resided in the integration of certain circuits which had previously been provided as separate chips, with the exception of the computer circuit which should remain separate. The computer circuit was in fact not included in claim 1.

- V. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 4 submitted on 25 November 1999.

## **Reasons for the Decision**

### 1. *The invention*

- 1.1 The invention is an image signal processing apparatus, typically intended for a CCD video camera. The image signal is applied to signal processing means in a known manner. The apparatus contains a plurality of pre-processing means which generate signals used for controlling parts of the apparatus. Examples of such parts are the autofocus, exposure and white balance sections. The signals are transmitted to an interface which is capable of communicating with an external computer, eg a microprocessor, which performs the necessary control. The signal processing means, pre-

processing means and interface are mounted on a single integrated circuit chip.

- 1.2 The appellant explained during the oral proceedings before the Board that it is an important feature of the invention that a microprocessor is **not** integrated on the chip containing the signal processing means, the pre-processing means and the interface. Such a feature is not expressly mentioned in claim 1. Nevertheless, for the purpose of the present decision, it is regarded as implied by the formulation "**external** computer".

2. *The prior art*

The Examining Division found that D2 shows the closest prior art. This document concerns the white balance circuits of a camera. Pre-processing means (comparators 20,20' in fig.2) generate pre-process signals used to set the gain in the respective colour signal channel. A microprocessor (23) controls this process. Data to and from the processor are transmitted over a signal bus. D2 is silent on the degree of integration of the circuits.

3. *Inventive step*

- 3.1 Since the invention is clearly new, only the issue of inventive step need be considered.

- 3.2 The Examining Division was of the opinion that all features of claim 1 in the version at that time were known from D2 with one exception, namely the integration of circuits on a single chip. The Board finds this assessment justified. The present claim 1 has however been amended in such a way that the

identification of some claim features with corresponding features in D2 has become less convincing. The differences the Board sees between the invention as now claimed and D2 are set out in the following.

3.3 As the appellant has pointed out, D2 concerns white balancing only and therefore does not disclose a **plurality** of pre-processing means for generating a **plurality** of different pre-process signals, at least if it is assumed that the white balance circuits correspond to one single pre-processing means in the meaning of the patent. It is however obviously known - and indeed acknowledged in the patent - that cameras conventionally contain other kinds of pre-processing means, eg for automatic focussing and exposure control. It can therefore be expected that the camera of D2 would also contain such functions, or at least that such functions could be added in a straight-forward manner.

3.4 In D2 the microcomputer is not shown to control any other functions than the white balance adjustment. The appellant has therefore suggested that a skilled man desiring to add functions to this camera would provide each such further section with a separate processor. This however appears unlikely in view of the well-known high capacity of modern microcomputers. The Board takes for granted that a single microcomputer would normally be sufficient to control all the functions of a camera, or that this possibility would at least always be considered by a designer. Similarly, it is normal that a microprocessor communicates with other units over a single data bus. It is also commonplace to provide a data interface wherever this is required, for example

in order to convert the data format. All these features, although not described in D2, are therefore regarded as conventional design options.

3.5 It follows that the only remaining feature in claim 1 which might involve an inventive step is the integration of the signal processing means, the pre-processing means and the interface on a single integrated circuit chip. This feature corresponds to the only difference found by the Examining Division. However, as already mentioned, the Board will consider also the absence of a microprocessor on this chip.

3.6 As to this feature, the Board agrees with the Examining Division that the mere desire to combine more functions on a single IC chip is not inventive as such. In fact, it is even said in the introduction of the patent application that "integration of such image sensing apparatuses has been considered". The appellant has however argued that the **particular choice** of circuits to integrate on the chip has inventive merit. According to the appellant, if the skilled man had considered integrating the circuits making up the white balance control in D2 he would also have included the microprocessor. The present inventors, however, had recognised that integrating a processor on the chip would have significant disadvantages. The cost of the chip would be much higher, and the data speed would be unnecessarily high, leading to possible radiation problems. Instead, according to the invention, a comparatively cheap, off-the-shelf microprocessor could be used.

3.7 This argument does not convince the Board for the following reasons.

An electronics designer wishing to integrate the camera functions discussed above on a single chip is inevitably faced with the problem of selecting which circuits to include. Clearly particular attention must be paid to the microprocessor since this circuit is likely to be the most complex part. The first thing to note is that the alternative is a clear-cut one: either the processor is included on the chip or it is not. Already this very limited choice strongly suggests that neither possibility is likely to involve an inventive step. Unexpected advantages with the invention are not apparent. The question of the cost of integrating the processor compared with the cost of using a commercially available one would be considered as a matter of course. The radiation problem is a known one and would therefore, if anything, lead the skilled man towards the invention rather than away from it. In the Board's view, probably only a technical prejudice against the choice according to the invention could have rendered this feature inventive. But since the patent itself refers to previous designs containing separate chips, such a prejudice is not likely ever to have existed.

- 3.8 The Board therefore concludes that the invention does not involve an inventive step.
  
- 3.9 In taking this decision based on a claim which is similar to but not identical with the one which the Examining Division considered, the Board has chosen to exercise itself the powers within the competence of the lower instance rather than to remit the case (Article 111(1) EPC). Due account was taken of the facts that the appellant had not requested a remittal and that the important aspects of the invention could



be discussed in detail during the oral proceedings  
before the Board.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:

M. Kiehl

P. K. J. van den Berg