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**D E C I S I O N**  
**of 3 May 2005**

**Case Number:** T 0926/03 - 3.5.2

**Application Number:** 97306531.1

**Publication Number:** 0827127

**IPC:** G08G 1/16

**Language of the proceedings:** EN

**Title of invention:**

Local positioning apparatus, and method therefor

**Applicant:**

MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.

**Opponent:**

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**Headword:**

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**Relevant legal provisions:**

EPC Art. 54

**Keyword:**

"Novelty (yes, after amendment)"

**Decisions cited:**

-

**Catchword:**

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Case Number: T 0926/03 - 3.5.2

**D E C I S I O N**  
of the Technical Board of Appeal 3.5.2  
of 3 May 2005

**Appellant:** MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.  
1006, Oaza Kadoma  
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Osaka 571-0050 (JP)

**Representative:** Rackham, Stephen Neil  
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**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 15 May 2003  
refusing European application No. 97306531.1  
pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** W. J. L. Wheeler  
**Members:** M. Ruggiu  
E. Lachacinski

## Summary of Facts and Submissions

I. The applicant filed an appeal against the decision of the examining division to refuse European patent application Nr. 97 306 531.1.

II. The reason given for the refusal was that claim 1 was unacceptable for lack of novelty, Article 54 EPC, in view of the state of the art disclosed in

D1: FR-A-2 674 354.

III. A further document was cited in a communication from the board that was annexed to summons to attend oral proceedings:

D4: entry "Luminance" in the 7th edition of the McGraw-Hill Encyclopedia of Science and Technology, vol. 10, 1992

In that communication the board indicated that it intended to remit the case to the department of first instance for further prosecution if certain amendments were made to the independent claims 1 and 12 of the application.

IV. The appellant filed amended claims 1 and 12 in reply to the communication from the board and indicated that it looked forward to receiving confirmation that the scheduled oral proceedings had been cancelled and the case remitted to the department of first instance for further prosecution.

V. The present independent claims 1 and 12 read as follows:

"1. A local positioning apparatus (LP) for detecting a local position of a subject (AM) capable of advancing in a direction relating to a lane in a local area based on a digital image signal (Si) representing a local image (Vi) of an area in an advancing direction of said subject (AM), said apparatus comprising:  
a first image signal generating means (204) for extracting a high spatial frequency component from the digital image signal (Si), and producing an edge signal (SH);  
a contour extraction means (400) for extracting a contour of a lane based on the edge signal (SH), and generating road contour data (Sre);  
a second image signal generating means (202) for extracting a low spatial frequency component from the luminance data of the digital image signal (Si), and thereby producing a low spatial frequency signal (SL);  
a lane area extraction means (300) for extracting the lane area based on the low spatial frequency signal (SL) and generating road region data (Srr); and  
a lane detection means (500) for checking the correctness of the road contour data (Sre) based on the road region data (Srr), and producing a lane detection signal (Sre) from which the position of the subject is determined."

"12. A local positioning method for detecting a local position of a subject (AM) capable of advancing in a direction relating to a lane in a local area based on a digital image signal (Si) representing a local image (Vi) of an area in an advancing direction of said subject (AM), comprising:

a first image signal generating step for extracting a high spatial frequency component from said digital image signal (Si), and producing an edge signal (SH); a contour extraction step for extracting a contour of a lane based on said edge signal (SH), and generating road contour data (Sre); a second image signal generating step for extracting a low spatial frequency component from the luminance data of the digital image signal (Si), and thereby producing a low spatial frequency signal (SL); a lane area extraction step for extracting said lane area based on said low spatial frequency signal (SL) and generating road region data (Srr); and a lane detection step for checking the correctness of said road contour data (Sre) based on the road region data (Srr), and producing a lane detection signal (Sre) from which the position of the subject is determined."

Claims 2 to 11 of the application are dependent on claim 1.

VI. The appellant essentially argued as follows:

In the decision appealed against, the examining division relied on the implication that since D1 used the three primary additive colours this was tantamount to using luminance information. However, D1 showed detecting the area of the lane based on the individual three primary colours, which was inaccurate due to the differing colours or tones of various roads. In the present invention, the lane area was detected using a luminance characteristic irrespective of the difference in colour and tone thereof, and the lane area could be

correctly determined irrespective of differently coloured roads.

## Reasons for the Decision

1. The appeal is admissible.
2. *Amendments*

Present claims 1 and 12 differ from claims 1 and 12 as originally filed in that:

- (a) the second image signal generating means or step is arranged for extracting a low spatial frequency component from the luminance data of the digital image signal (Si), and thereby producing a low spatial frequency signal (SL);
- (b) the lane area extraction means or step is arranged for extracting the lane area based on the low spatial frequency signal (SL);
- (c) the lane detection means or step is arranged for checking the correctness of the road contour data (Sre) based on the road region data (Srr); and
- (d) the lane detection means or step is arranged for producing a lane detection signal from which the position of the subject is determined.

The following passages of the application as filed provide a basis for these features:

feature (a): page 19, lines 1 to 6, and page 19, line 21 to page 20, line 2;

feature (b): page 15, lines 12 to 16;

feature (c): page 16, lines 12 to 15; and

feature (d): page 17, lines 8 to 16.

Thus, the amendments to claims 1 and 12 do not contravene Article 123(2) EPC.

### 3. *Novelty*

- 3.1 The document D1 describes a method for analysing a digital image signal and an apparatus for the implementation of the method. A CCD camera 3 and an analog-to-digital converter 10 provide a colour digital image of an area in an advancing direction of the vehicle. A converting device 12 combines the colour components in the digital output signal from the analog-to-digital converter 10 to digital values representing the luminance Y of the image pixels. Means 13 calculates, in a step 130, the amplitudes of the gradients in the luminance signal and thereby generates an edge signal ("image de l'amplitude des contours": page 8, lines 17 to 22 and Figure 3 of D1). Then, in steps 131 and 132, the means 13 extracts the contour of a road ("bords de route": page 9, lines 6 to 12 and Figure 3 of D1) based on the edge signal obtained in step 130 and thereby generates road contour data. The RGB colour digital signal from the analog-to-digital converter 10 is transmitted to means 11, which analyses the colour components of the signal. For each pixel, the means 11 calculates in steps 111 to 117 mean spatial values VAL R, VAL V, VAL B of the red, green and blue components and processes these mean values to divide the pixels into two classes: road and non-road

(see in particular page 9, lines 32 and 33 and Figure 5 of D1). The information provided by the means 11 and 13 are then combined by means 15 in a step 150 for checking the correctness of the road contour data generated in step 132 based on the road region data obtained in steps 111 to 117. Step 150 produces a lane detection signal ("masque de la route") which permits localisation of potential obstacles on the road in front of the motor vehicle (see page 11, lines 6 to 12 and page 13, line 30 to page 14, line 23 of D1).

3.2 Luminance is commonly defined as the luminous intensity per unit area projected in a given direction (see for example document D4). Thus, once the unit of luminance has been chosen, the luminance of a pixel is represented by a single numerical value. It is also known that luminance can be obtained as a weighted sum of the RGB components of a colour video signal. Indeed, in D1, as indicated above, a luminance signal is generated by combining the colour components in the digital output signal from the analog-to-digital converter and a high spatial frequency component ("image de l'amplitude des contours") is extracted from the luminance signal. In D1, a lane area is extracted from the components of the RGB colour digital signal by calculating for each pixel mean values VAL R, VAL V, VAL B of the red, green and blue components and processing these mean values to divide the pixels into two classes: road and non-road. It is therefore apparent that in D1 the lane area is not obtained from the luminance data of the digital image signal (which are specifically mentioned in D1 in connection with the generation of the edge signal), but rather from the separate individual RGB components of the digital image



signal. The subject-matter of claims 1 and 12 of the application, which specify extracting a low spatial frequency component from the luminance data of the digital image signal, is therefore not part of the disclosure of document D1 and thus can be considered as new in the sense of Article 54(1) EPC.

4. It is apparent from the file of the application, and in particular from the decision under appeal, that examination of the application has not yet been completed. In particular, inventive step seems not to have been examined yet. Therefore, the board makes use of its power under Article 111(1) EPC to remit the case to the department of first instance for further prosecution. As anticipated by the appellant, the oral proceedings before the board have been cancelled.

## **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

W. J. L. Wheeler