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**Datasheet for the decision
of 9 September 2021**

Case Number: T 1262/20 - 3.2.01

Application Number: 10846647.5

Publication Number: 2541525

IPC: B60R1/00, G06K9/00

Language of the proceedings: EN

Title of invention:

VEHICLE SURROUNDINGS MONITORING DEVICE

Applicant:

Aisin Seiki Kabushiki Kaisha

Headword:

Relevant legal provisions:

EPC Art. 123(2), 83, 84, 54, 56

Keyword:

Amendments - allowable (yes)
Sufficiency of disclosure - clarity of disclosure - main
request (yes)
Claims - clarity - main request (yes)
Novelty - main request (yes)
Inventive step - main request (yes)

Decisions cited:

Catchword:



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Boards of Appeal
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Case Number: T 1262/20 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 9 September 2021

Appellant: Aisin Seiki Kabushiki Kaisha
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 3 January 2020
refusing European patent application No.
10846647.5 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman G. Pricolo
Members: A. Wagner
A. Jimenez

Summary of Facts and Submissions

- I. The appeal of the applicant lies against the decision of the Examining Division to refuse the European patent application 10846647.5.
- II. In the decision under appeal the Examining Division concluded that the main request and the first and fifth auxiliary requests did not meet the requirements of Article 83 EPC, that claim 1 of the second auxiliary request was not clear in the sense of Article 84 EPC, and that the third and fourth auxiliary requests were not admissible. In a section entitled "Obiter dictum", the Examining Division further stated that claim 1 according to the main request was not clear (Article 84 EPC).
- III. With the statement of grounds of appeal, the appellant (applicant) requested to set aside the decision under appeal and to grant a patent on the basis of the main request corresponding to the first auxiliary request of the first instance proceedings. As an auxiliary measure the appellant requested to grant a patent on the basis of one of the auxiliary requests 1 to 4, filed for the first time with the statement of grounds of appeal.
- IV. After a telephone conversation with the rapporteur of the Board, the appellant filed a new main request with letter dated 16 June 2021.

Following a further telephone conversation with the rapporteur of the Board, the appellant requested with letter of 14 July 2021 to set aside the decision of the Examining Division and to grant a patent based on the following documents:

Claims 1 to 3 according to the main request filed with letter of 16 June 2021;
Description page 2, filed with letter of 7 September 2017, pages 3 to 5 and 11 filed with letter of 14 July 2021, pages 1, 6-10 and 12 to 17, filed with entry into the EP-phase;
Drawings, sheets 1/6 to 6/6 as filed with entry into the EP-phase;
or, in the alternative, to grant a patent based on one of the auxiliary requests 1 to 4, filed with the statement of grounds of appeal.

V. In the present decision reference is made to the following documents:

D1: Lavrinc: "Nissan releases details about "Around View Monitor"", retrieved from the Internet on:
URL:<http://www.autoblog.com/2007/10/12/nissan-releases-details-about-around-view-monitor/#slide-429153>

D1*: JP 2007 022471 A

D2: US 2004/098224 A1

D2*: JP 2004 37239 A

D3: EP 1 748 654 A1

D4: YU-CHIH LIU ET AL: "Bird's-Eye View Vision System for Vehicle Surrounding Monitoring", 18 February 2008 (2008-02-18), ROBOT VISION: SECOND INTERNATIONAL WORKSHOP, ROBVIS 2008, AUCKLAND, NEW ZEALAND, FEBRUARY 18-20, 2008; PROCEEDINGS; [LECTURE NOTES IN COMPUTER SCIENCE], SPRINGER, BERLIN. HEIDELBERG, PAGE(S) 207 - 218; ISBN: 978-3-540-78156-1

VI. Claim 1 of the main request reads as follows:

A vehicle surroundings monitoring device comprising:
an object detection unit (11) provided in a vehicle and including a plurality of sonars whose detection ranges, that are prescribed at a predetermined angle set in advance, differ from each other at least partially, and an image capturing device detecting the direction and the distance of an object from the vehicle, whose detection range overlaps with the detection ranges of the sonars at least partially,

a vehicle image generation unit (14) for generating an image of the vehicle with the point of view set above the vehicle;

a periphery image generation unit (15) for acquiring and generating an image of the periphery of the vehicle from the point of view on a monitor, the image being partitioned into a plurality of regions in the periphery of the image of the vehicle; and

a position-calculating unit (13) for calculating a corresponding position of a detected object in the image of the periphery on the basis of detection results of the object detection unit (11),
characterized by

a degree-of-confirmation assessment unit (12) for determining that a degree of confirmation meets or exceeds an assessment threshold set in advance when a direction in which the object exists is within the detection range of the sonar, and determining that the degree of confirmation is less than the assessment threshold when the direction in which the object exists is not within the detection range of the sonar, the

direction being detected by the image capturing device;
and

an indicator unit (16) for indicating a position showing existence of the object in the image of the periphery based on the calculation results of the position-calculating unit (13) when the degree of confirmation of the detection results meets or exceeds the assessment threshold, and for indicating the corresponding a region showing existence of the object among the plurality of the regions in the image of the periphery on the basis of the calculation results of the position-calculating unit (13) when the degree of confirmation of the detection results is less than the assessment threshold.

Reasons for the Decision

The main request on file meets the requirements of the EPC.

1. Article 123(2) EPC

The Board agrees with the appellant that claim 1 of the main request finds proper basis in the application as filed, namely in claims 1 to 4 taken together with paragraphs [0029, 0034, 0039, 0040, 0042, 0046, 0047, 0048] and Figures 2 and 3 of the application as originally filed. Accordingly, the amendments made to claim 1 meet the requirements of Article 123(2) EPC.

2. Article 83 EPC

2.1 The Board judges that the requirements of Article 83 are fulfilled.

- 2.2 The Examining Division was of the opinion that the description did not enable a skilled person to implement the step of assessing the degree of confirmation as it required a calculation of the correlation between an object direction (θ), found through image processing, and an object distance (m), found through measuring sonar data (decision, chapters 12.9, 13.3 and 17). Considering that the object direction was an angle (θ) and that the sonar only detected a distance (m), the Examining Division concluded that it was not disclosed how a correlation between these different input data could be executed.
- 2.3 The objection of the Examining Division cannot be followed. In the application as filed taken as a whole, and in claim 1 of the main request as well, both the sonars' and the image capturing device's data include an angle and a distance, as explained herein below.
- 2.3.1 The implicit functionality of the sonars is to detect a distance. Their detection range is "*prescribed at a predetermined angle set in advance*" (see claim 1 and paragraph [0042] of the application as filed). Even if the sonars do not detect an angle, the sonars' detection range is limited to a specific sector defined by an angle.
- 2.3.2 The image capturing device detects the direction and the distance (see claim 1 of the main request and paragraph [0029] of the application as filed).
- 2.3.3 The Board agrees with the appellant referring to the two embodiments disclosed in the originally filed application, that either two angles or two distances are compared to each other.
In the first embodiment (according to claim 1)

described in paragraph [0042], the **angles** are used to define a correlation: *"a correlation exists in the case that the direction of the object that is detected by the first object detection unit 21 [image capturing device] is included within the detection range of the second object detection unit 22 [sonars] which has detected the object that exists at a predetermined distance from the vehicle 50"*.

In the second embodiment (not claimed) described in paragraph [0043] of the application as filed, the **distances** are used to define a correlation: *"a correlation exists when the distance between the object, which is included in the captured image obtained by the first object detection unit 21, and the vehicle 50 is calculated by image recognition, and the results of the calculation and the distance that is detected by the second object detection unit 22 [sonars] substantially match"*.

Consequently the data obtained and/or included in the two types of objection detection units have the same unit and can be compared.

3. **Article 84 EPC**

3.1 Claim 1 of the main request on file meets the requirements of Article 84 EPC.

3.2 The Examining Division raised clarity objections under chapter 14, referring to auxiliary request 2 of the first instance proceedings, and chapter 19 of the decision, referring to the main request of the first instance proceedings.

3.3 The issues of chapter 19 are solved by the wording of claim 1 of the main request on file and as such do not

longer apply.

In detail the objections were that

- a) it was not clear what data were used/obtained by the object detection units;
- b) the device had no image capture means;
- c) the data analysed was not necessarily obtained from different sensors;
- d) it was not clear what was meant by "the object detecting unit being provided to the vehicle";
- e) there was no support in the description for the acquisition of a peripheral image;
- f) it was not clear what was meant by "degree-of-confirmation";
- g) it was not clear how the position-calculating unit calculates a position of the detected object from only distance information.

Claim 1 of the main request clarifies that

- a) the data used/ obtained are the direction and the distance;
- b) the device includes an image capturing device;
- c) the data of the image capturing device and of the sonars are analysed;
- d) the objection detection unit is provided "in a vehicle";
- e) the feature "acquiring" is implicit from the context when generating an image with a periphery image generation unit;
- f) the degree-of-confirmation is assessed by comparing directions;
- g) the position-calculating unit calculates a position or a region based on the detection results, i.e. the distance and the direction.

3.4 Under chapter 14 of the decision, the Examining Division raised the objection that it was not clear and not disclosed how the position calculation device calculated a position or a region. In particular a "region" was not technically defined. Furthermore it was not clear and not disclosed how the results were combined in case that both object detection units detected an object but the detection results were not confirmed (decision, chapter 14.4.3).

3.4.1 Although the Examining Division raised these objections under the heading of a lack of clarity under Article 84 EPC, the Examining Division also referred to a lack of disclosure, which is rather an issue under Article 83 EPC. Either way, the Board does not agree with these findings.

3.4.2 The Board takes the view that the claim is clear. In particular, it is clear for a person skilled in the art what a region is, namely an area defined by a set of positions, and how to calculate a position or a region, for the following reasons:

Position:

Claim 1 defines that a position is calculated if the direction detected by the image capturing device is confirmed by the detection range wherein an object is detected by the sonar. As both, image capturing device and sonar, additionally detect a distance, all data for calculating a position are available.

Region:

From claim 1 it is clear that a region only is calculated if only one of the sonars or image capturing device detects an object or if both detect an object, but their results are not confirmed.

How the region can be calculated in case that only the sonars detect an object is acknowledged by the Examining Division in chapter 14.4.2 of the decision, stating that "*the region would be all pixels at the distance detected within the range of the particular sonar*".

In case that only the image capturing device detects an object, claim 1 of the main request defines that the image capturing device detects the direction and the distance of an object. Thus all necessary data are available to calculate a region around a detected position.

In the case that both, the sonars and the image capturing device, detect an object, but their results are not confirmed, claim 1 defines that the regions are calculated "*on the basis of the detection results*", thus two regions are calculated. This understanding of claim 1 is confirmed by paragraph [0055] of the application as filed, last sentence, wherein it is described that in such case the regions are calculated "*on the basis of each of the detection results*". The steps #08, #09 of the process shown in fig. 6 are namely carried out following the detection of an object by both units (steps #03, #07) when no correlation exists (step #04, arrow No), for both detection results whereby two regions are identified as can be seen in fig 5.

3.4.3 There is therefore no issue of clarity or of lack of sufficiency in relation to claim 1.

4. **Article 11 RPBA**

The decision under appeal only deals with objections

under Articles 83 and 84 EPC and does not deal with novelty and inventive step. However the Board considers that no special reasons present themselves for a remittal to the first instance in accordance with Article 11 RPBA, in particular because these issues can be decided in favour of the appellant as explained herein below.

5. **Novelty - Article 54 EPC**

The claimed subject-matter is new in view of the documents cited in the international search report and in the supplementary European search report as none of them discloses a position-calculating unit calculating a position or a region **in dependency of** the result of a degree-of-confirmation assessment, the position or region then being indicated by an indicator unit.

6. **Inventive step - Article 56 EPC**

6.1 The claimed subject-matter involves an inventive step over the cited prior art.

6.2 Documents D1 and D2 were cited in the European search opinion; documents D3 and D4 were additionally cited in the communication annexed to the summons to oral proceedings issued by the Examining Division; documents D1* and D2* were cited by the international searching authority as being of particular relevance.

6.3 In the Board's view, D2 is considered the closest prior art for the subject-matter of claim 1 of the main request under consideration, as it is the only cited document disclosing that the detection results of two different types of sensors are compared to identify if the detected objects are identical. It is noted that

D2* is a member of the patent family of D2 and provides the same disclosure. D2 discloses a degree-of-confirmation assessment unit for determining whether or not an object detected by a stereoscopic camera 2 and a millimeter wave radar 9 are the same (paragraph [0002], Figure 1).

In D2 it is recognized that, when using two types of object detection means, objects being far away from the vehicle can not reliably be identified as being identical (D2, paragraph [0008]). D2 solves this problem by considering correction parameters in the degree-of-confirmation calculation (see paragraph [0010], fig. 9).

- 6.4 The device of claim 1 differs from the device known from D2 in the features "vehicle image generation unit", "periphery image generation unit" and "indicator unit". D2 neither generates an image from above nor indicates a position or region in the periphery image from above partitioned into a plurality of regions.
- 6.5 Starting from D2, the objective technical problem can be formulated as providing a device that visually displays and communicates the detection results to the driver.
- 6.6 The claimed solution is not rendered obvious by the cited prior art.
 - 6.6.1 Claim 1 proposes to visualize the detection results on a monitor in a generated bird's view image and thereby communicate the accuracy of an obstacle detection result to the driver (accuracy in the sense of confirmed/not confirmed by the further object detection means). None of the cited documents hints to such a

solution.

6.6.2 D1 and D1* disclose displaying the results of the objection detection on a bird's view image generated by a vehicle image generation unit.

However the skilled person would not arrive at the claimed subject matter when combining D2 with D1 or D1* as the devices disclosed therein do not use second object detection means for confirming the results of the first object detection means or suggests an indication of the object in dependency of the result of the degree-of-confirmation assessment of D2.

6.6.3 The disclosure of D3 and D4, and of the further documents cited in the search reports, does not go beyond the disclosure of D1 or D1* and therefore is likewise not prejudicial to inventive step of claim 1 of the main request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Examining Division with the order to grant a European patent on the basis of the following documents according to the main request:
 - Claims 1 to 3 filed with letter dated 16 June 2021;
 - Description:
 - page 2 filed with letter dated 7 September 2017,
 - pages 3 to 5 and 11, filed with letter dated 14 July 2021

- pages 1, 6-10 and 12 to 17, filed with entry into the EP-phase;
- Drawings, sheets 1/6 to 6/6 as filed with entry into the EP-phase.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated