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Datasheet for the decision of 26 May 2010

Case Number: T 0771/08 - 3.2.01

Application Number: 04024966.6

Publication Number: 1527959

IPC: B60R 21/01

Language of the proceedings: EN

Title of invention:
Passenger restraint device of motor vehicle

Applicant:
NISSAN MOTOR CO., LTD.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 123(2)

Relevant legal provisions (EPC 1973):
EPC Art. 54, 56

Keyword:
"Amendments - added subject-matter (no - after amendment)"
"Novelty (yes - after amendment)"
"Inventive step (yes - after amendment)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0771/08 **-** 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 26 May 2010

Appellant: NISSAN MOTOR CO., LTD.
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Representative: Grünecker, Kinkeldey,
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 22 November 2007 refusing European application No. 04024966.6 pursuant to Article 97(1) EPC 1973.**

Composition of the Board:

Chairman: S. Crane
Members: J. Osborne
T. Karamanli

Summary of Facts and Submissions

I. The appeal is directed against the decision posted 22 November 2007 refusing European patent application No. 04 02 4966.6.

II. The following state of the art evidence was present in the file:

D1: DE-C-198 18 586;

D2: US-A-2003/0149530;

D3: US-B-6 271 747.

III. The examining division found that the subject-matter of claims 1 according to a main request and 10 auxiliary requests variously was not new, did not involve an inventive step or extended beyond the content of the application as originally filed.

IV. With its statement of grounds of appeal the appellant filed a main request and twelve auxiliary requests. The board issued a communication pursuant to Rule 100(2) EPC and indicated its provisional opinion that the claims 1 according to the main request and first to fourth auxiliary requests were variously unclear, contained subject-matter which extended beyond the content of the application as originally filed or defined subject-matter which was not new or did not involve an inventive step. The board also indicated that claim 1 of the fifth auxiliary request appeared to relate to inventive subject-matter, which also had been

the opinion of the examining division, and invited the appellant to adapt its requests accordingly.

V. With a letter dated 12 January 2010 the appellant filed *inter alia* new pages of description together with new figures 15, 16 and 17. With a further letter dated 3 May 2010 the appellant requested that the decision under appeal be set aside and a patent granted on the basis of claims 1 to 11 filed therewith.

VI. Claim 1 reads as follows, wherein in comparison with claim 1 as originally filed text added is italicised and text removed is bracketed:

"A passenger restraint device (100, 200, 300, 400, 500, 600) of a motor vehicle, comprising:
a plurality of predicting devices (10, 11, 12) each being able to predict or detect a collision of the vehicle with an obstacle in front of the vehicle;
a sensitivity adjusting device (42) that is able to adjust a sensitivity of at least one of the predicting devices (10, 11, 12);
reversible passenger restraining devices (31, 32) that are able to reversibly restrain a passenger in the vehicle;
non-reversible passenger restraining devices (33, 34) that are able to non-reversibly restrain the passenger in the vehicle; and
a control unit (40) that *controls operation of the reversible and non-reversible passenger restraining devices based on a signal of at least one of the predicting devices (10, 11, 12),*
said control unit (40) controls operation of the reversible passenger restraining devices and operation

of non-reversible passenger restraining devices, based on the signal from said one of the predicting devices *whose sensitivity is able to be adjusted* [that has been subjected to the sensitivity adjustment by the sensitivity adjusting device] characterized in that *said sensitivity adjusting device (42) is able to adjust the sensitivity of a predicting device (11) which is adapted to detect a distance of the vehicle to the obstacle based on a prediction of an other predicting device (10) which is adapted to detect a distance of the vehicle to the obstacle*."

Claims 2 to 11 specify features additional to the subject-matter of claim 1.

Reasons for the Decision

1. The application relates to occupant restraint systems for road vehicles. Restraint systems may include reversible devices such as a displaceable knee bolster and non-reversible devices such as an airbag. In order to minimise cost of replacement it is desirable that non-reversible devices are deployed only when the chance of them being needed has been determined as sufficiently high. Reversible devices, on the other hand, may be deployed already when a collision is predicted with a lower degree of probability, thereby allowing more time for actuation. Accordingly, various sensors may be employed to provide differing degrees of probability of the occurrence a collision. In accordance with the present application multiple sensors are employed to predict whether a collision will occur. When one predicts a collision the

sensitivity of another is adjusted in order to improve accuracy of the prediction.

Amendments

2. In comparison with its content as originally filed the subject-matter of claim 1 has been amended essentially by:

- the replacement of the wording "that has been subjected to the sensitivity adjustment by the sensitivity adjusting device" by "whose sensitivity is able to be adjusted"; and

- the addition of the content of the characterising portion.

2.1 In the description of the preferred embodiment the operation of the sensitivity adjustment is explained with reference to a flow diagram in figure 6. Sensitivity adjustment takes place at step 12. In the preceding step 11 the device checks whether a collision is predicted. If so, the routine passes to step 12 and adjusts the sensitivity. If, on the other hand, at step 11 no collision is predicted the routine by-passes step 12 and goes to steps 13 and 14 where another device is checked for prediction of a collision. If that other device predicts a collision which subsequently takes place (step 16) the restraint systems are actuated without any change in sensitivity taking place. It follows that the presently claimed definition of a predicting device "whose sensitivity is able to be adjusted" was originally disclosed and is consistent with the description.

2.2 The content of the characterising portion is derived from the application as originally filed disclosing short and long range distance detecting devices, whereby the sensitivity of one is adjusted in dependence on the prediction of the other, see particularly claim 2, page 5, line 24 to page 6, line 2, page 7, lines 17 to 21 and page 35, lines 4 to 8.

3. The subject-matter of claims 2 to 11 is essentially identical to that of claims 5 to 8 and 10 to 15 as originally filed. The description has been amended essentially only by deletion of matter for consistency with the claims and addition of a more complete acknowledgement of the state of the art.

4. It follows from the foregoing that the subject-matter of the application does not extend beyond that as originally disclosed (Article 123(2) EPC).

Novelty (Article 54(1) EPC 1973)

5. According to D1 a sensor monitors the presence of obstacles. If one is detected a further sensor is activated which is able to determine the mass of the obstacle. The extent of activation of occupant restraint means is dependent on the determined mass. There is no teaching of adjustment of the sensitivity of a predicting device.

6. D2 discloses a sensor fusion mounted on a vehicle for generating a signal for the operation of both reversible and non-reversible occupant restraint devices. The sensor fusion may comprise a combination

of sensors such as multiple motion sensors, accelerometers, cameras, transponders, radar, lidar etc. The sensor fusion generates a signal representative of the surroundings which is supplied to a threat assessor which determines the potential for a collision between the vehicle and an object. The threat assessor determines on the basis of the sensor fusion signal and other signals *inter alia* any adjustment to be made to the orientation or sensitivity of a sensor within the sensor fusion. The signal from the fusion including such an adjusted sensor may be used to control operation of the restraining devices. However, there is no disclosure of a signal from one sensor being used to adjust the sensitivity of another. On the contrary, since the sensor fusion emits a single signal any adjustment of the sensitivity of a radar sensor within the fusion would be based on a signal from that same sensor. Indeed, there is no disclosure of two sensors both able to detect distance to an obstacle.

7. D3 relates to a refinement of an earlier disclosure concerning actuation of a restraining device in a vehicle. According to the earlier disclosure an accelerometer measures crash acceleration from which a crash value is determined and compared against a threshold value. A radar system monitors range and closing velocity between the vehicle and a target and issues a pre-crash signal. The threshold value is varied in response to the issuance of the pre-crash signal. D3 refines the system of the earlier disclosure to delay reduction of the threshold until a crash signal is received within a predetermined time limit after issuance of the pre-crash signal. There is only one radar system.

8. It follows from the foregoing that the subject-matter of claim 1 is new with respect to the available state of the art.

Inventive step (Article 56 EPC 1973)

9. The closest state of the art for consideration of inventive step of the subject-matter of claim 1 is that disclosed in D2. The applicant does not dispute that all features of the preamble are known from D2. The subject-matter of the claim differs therefrom in that:

- the sensitivity adjusting device is able to adjust the sensitivity of a predicting device which is adapted to detect a distance of the vehicle to the obstacle based on a prediction of another predicting device which is adapted to detect a distance of the vehicle to the obstacle.

9.1 As already set out under point 6 above, in accordance with D2 a signal from a sensor fusion is supplied to a threat assessor which determines the probability of a collision occurring. The role of that probability value in the deployment of both reversible and non-reversible occupant restraining devices is explained with reference to Figures 4A and 4B. At a probability of collision of ≥ 60% reversible seat belt pretensioners are deployed to an appropriate level. At a probability of ≥ 95% additional reversible occupant protection means such as knee bolsters are activated whilst non-reversible means are activated only when the collision has been confirmed. D2 teaches that reversible occupant

restraint means may be deployed earlier in a collision event and therefore at a reduced rate.

9.2 In accordance with the present application the information derived from the signal of one sensor adapted to detect distance to an obstacle serves as the basis for adjusting the sensitivity of another. In the preferred embodiment each "predicting device which is adapted to detect a distance of the vehicle to the obstacle" takes the form of a radar unit, one being of a longer range than the other. When the longer range radar predicts a collision with an obstacle the sensitivity of the shorter range radar is adjusted. In this way the response of the shorter range radar may be better tailored to the task of accurate determination of high probability of a collision occurring. The corresponding problem may be seen as further improving the activation of the occupant restraint system.

9.3 Neither of the other cited documents has any teaching relevant to improving the operation of one distance-determining sensor in dependence on the information supplied by another. Moreover, the provision of two distance-determining sensors, one of whose sensitivity is dependent on the output of the other extends beyond the general technical knowledge of the skilled person when combined with the teaching of D2. The board therefore finds that the subject-matter of claim 1 involves an inventive step. Since claims 2 to 11 contain all features of claim 1 the same conclusion applies equally to them.

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 with the order to grant a patent on the basis of the following documents:

   - Claims 1 to 11 filed with the letter of 3 May 2010;

   - Description pages 1, 1a, 1b, 1c, 2, 3, 3a, 4 to 27, 32 to 35 filed with a letter of 12 January 2010;

   - Drawings figures 1 to 14 as originally filed and figures 15 to 17 filed with the letter of 12 January 2010.

The Registrar: The Chairman:

A. Vottner S. Crane