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D E C I S I O N
of 22 February 2000

Case Number: T 0972/97 - 3.2.4

Application Number: 91104627.4

Publication Number: 0449160

IPC: F02D 35/00

Language of the proceedings: EN

Title of invention:

Control system for controlling output torque of internal combustion engine

Applicant:

DENSO CORPORATION

Opponent:

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Headword:

-

Relevant legal provisions:

EPC Art. 123(2)

EPC R. 86(3)

Keyword:

"Discretion of the examining division"

"Amendments - added subject-matter (yes)"

Decisions cited:

G 0007/93

Catchword:

-



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Boards of Appeal

Chambres de recours

Case Number: T 0972/97 - 3.2.4

D E C I S I O N
of the Technical Board of Appeal 3.2.4
of 22 February 2000

Appellant: DENSO CORPORATION
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 29 April 1997
refusing European patent application
No. 91 104 627.4 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: C. A. J. Andries
Members: H. A. Berger
R. E. Teschemacher

Summary of Facts and Submissions

- I. The appellant (applicant) has lodged an appeal against the examining division's decision of 29 April 1997 to refuse European patent application No. 91 104 627.4. The appeal was received on 19 June 1997 and the appeal fee was paid simultaneously. The statement of the grounds of appeal was received on 3 September 1997.
- II. In reply to a first communication of the examining division the applicant, of his own volition, filed a set of amended claims 1 to 5 with letter dated 1 August 1994. After several consultations by telephone a set of claims 1 to 6 was worked out during a personal consultation dated 17 July 1995. According to the minutes of this consultation the applicant's attention was drawn to Rule 86(3) EPC, and it was stated that the set of claims was considered to be allowable.

The wording of claim 1 worked out on 17 July 1995 is as follows:

" A control apparatus of an internal combustion engine system (1) of a motor vehicle which is equipped with an automatic transmission (25, 27) which comprises a lock-up mechanism and a throttle valve (7) for controlling the torque of said engine (1), said control apparatus comprising:

[1] an opening amount detecting means (41a) for detecting an opening amount of an acceleration pedal (41) operated by a driver;

[2] an engine speed detecting means for detecting

the engine speed;

[3] a vehicle acceleration detecting means (63) for detecting the vehicle acceleration (6);

[4] a torque estimating means for estimating an amount of torque required by said engine (1) based on the respectively detected opening amount (A_p) of said acceleration pedal (41) and the engine speed; and

[5] a throttle valve driving means for driving said throttle valve (7);

characterized by

[6] a vehicle resonance reducing means for controlling the opening degree of said throttle valve (7) when said vehicle is in an acceleration state so as to reduce a resonance accompanying the operation of said engine (1), said reducing means comprising

[6.1] a lock-up control means (50) for controlling said lock-up mechanism in such a way that said automatic transmission (25,27) is locked-up when said vehicle resonance reducing means is in operation and when said motor vehicle is in a preselected operating condition other than a start state and a speed-shifting state; and

[6.2] a torque correcting means for correcting the torque estimated by said torque estimating means based on the respectively detected vehicle

acceleration (6) in a direction which prevents the occurrence of vehicle hunting, said correcting means comprising

a filtering means which filters a torque estimation signal of said torque estimating means and which has a characteristic to damp a specific frequency component included in the torque estimation signal, which causes vehicle hunting, with a predetermined damping factor; and

[7] a target throttle opening determining means for determining a target throttle opening degree of said throttle valve (7) based on the torque corrected by said torque correcting means; wherein said throttle valve driving means (9) is driving said throttle valve (7) in such a way that the respectively determined target throttle opening degree is established."

III. Instead of this agreed claim 1 that was the result of the personal consultation, the applicant filed with the letter of 17 October 1995 amended pages 1 to 5 of the description and a set of claims 1 to 6 with a claim 1, which was amended with respect to claim 1 resulting from the personal consultation. In the new claim 1 mainly features 3 and 6.2 were amended by replacing the parameter "vehicle acceleration" by the parameter "transmission gear position" or "gear position".

The wording of claim 1 filed with the letter of 17 October 1995 is as follows:

"Control apparatus of an internal combustion engine system (1) of a motor vehicle which is equipped with an automatic transmission (25, 27) which comprises a lock-up mechanism and a throttle valve (7) for controlling the torque of said engine (1), said control apparatus comprising:

- [1] an opening amount detecting means (41a) for detecting an opening amount (Ap) of an acceleration pedal (41) operated by a driver;
 - [2] an engine speed detecting means (19a) for detecting the engine speed (Ne);
 - [3] a gear position detecting means (27a) for detecting a gear position of said automatic transmission (25,27);
 - [4] a torque estimating means for estimating an amount of torque required by said engine (1) based on the respectively detected opening amount (Ap) of said acceleration pedal (41) and the engine speed (Ne); and
 - [5] a throttle valve driving means (9) for driving said throttle valve (7);
- characterized by
- [6] a vehicle resonance reducing means for controlling the opening degree of said throttle valve (7) when said vehicle is in an acceleration state so as to reduce a resonance accompanying the operation of said engine (1),

said resonance reducing means comprising

- [6.1] a lock-up control means (50) for controlling said lock-up mechanism in such a way that said automatic transmission (25,27) is locked-up when said vehicle resonance reducing means is in operation and when said motor vehicle is in a preselected operating condition other than a start state and a speed-shifting state; and

- [6.2] a torque correcting means for correcting the torque estimated by said torque estimating means based on the respectively detected transmission gear position in a direction which prevents the occurrence of vehicle hunting, said torque correcting means comprising a filtering means which filters a torque estimation signal of said torque estimating means and which has a characteristic to damp a specific frequency component included in the torque estimation signal, which causes vehicle hunting, with a predetermined damping factor; and

- [7] a target throttle opening determining means for determining a target throttle opening degree of said throttle valve (7) based on the torque corrected by said torque correcting means; wherein
said throttle valve driving means (9) is driving said throttle valve (7) in such a way that the respectively determined target throttle opening degree is established."

The applicant pointed out that the detection of the

vehicle acceleration was not essential, however it was necessary to provide a gear position detecting means for detecting the gear position of the automatic transmission, and he drew the examining division's attention to Figure 13, to the second paragraph of page 29 and to page 36 of the originally filed description.

- IV. After a further consultation by telephone (dated 13 March 1996) oral proceedings were held on 16 January 1997 in accordance with a request of the applicant. The applicant maintained claim 1 filed with the letter of 17 October 1995 as part of his main request and claim 1 worked out during the personal consultation as part of his auxiliary request. The chairman announced that the main request would not be allowed in view of Rule 86(3) EPC, since the amended claim constituted an essential change of subject-matter.

With a communication under Rule 51(4) EPC the applicant was informed that the examining division intended to grant a patent on the basis of the application with the claims 1 to 6 of 17 July 1995, according to the auxiliary request.

With the letter dated 7 April 1997 the applicant requested, in response to the communication under Rule 51(4) EPC, to grant a patent on the basis of the documents as filed with letter of 17 October 1995, in combination with the original specification pages 9 to 61.

In the decision posted 29 April 1997 the examining division refused the application according to

Rule 51(5) EPC, as the applicant had not approved the text specified in the communication under Rule 51(4) EPC. The applicant's main request of 17 October 1995 was refused under Rule 86(3) EPC. The examining division set out that, as could be derived from the original application documents (see e.g. page 20, line 20 to page 21, line 4; page 22, lines 8 to 21; page 36, lines 2 to 20), the features (a) and (b), corresponding to the above cited features [3] and [6.2] of claim 1 filed during the personal consultation (see above section II), constituted essential features for the performance of the invention. Their replacement by features (d) and (c), corresponding to the above cited features [3] and [6.2] of claim 1 filed with letter of 17 October 1995 (now main request - see above section III), obviously resulted in an essential change of the subject-matter of claim 1, as the parameters "vehicle acceleration" and "gear position" were not considered as being equivalent. This replacement would further require a renewed examination with respect to Articles 123(2), 54, 56 and 84 EPC.

V. Oral proceedings before the board were held on 22 February 2000.

The applicant argued that the claims 1 to 6 as accepted by the examining division had not been amended by the applicant, but by the examining division during the interview on 17 July 1995. He further maintained that the amendments of claim 1 worked out during the interview were not in conformity with the basic teaching of the originally filed application.

VI. *Requests*

The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of the following documents:

Claims 1 to 6: as filed with letter of 17 October 1995;

Description: pages 1 to 5 as filed with letter of 17 October 1995,
pages 9 to 61 as originally filed;

Drawings: Figures 1 to 51B (sheets 1/22 to 22/22)
as filed with letter dated 8 May 1991.

The pages 9 to 61 should be renumbered as new pages 6 to 58.

The appellant further requested reimbursement of the appeal fee.

Reasons for the Decision

1. The appeal is admissible.
2. *Rule 86(3) EPC*
 - 2.1 According to Rule 86(3) EPC the applicant may, of his own volition, amend once the description, claims and drawings after receipt of the first communication, provided that the amendment is filed at the same time as the reply to the communication. No further amendment may be made without the consent of the examining division. In the present case the appellant amended the application after receipt of a first communication from

the examining division (see above section II). Further amendments could therefore not be made without the consent of the examining division.

- 2.2 With respect to the claims 1 to 6 worked out during the personal consultation, and agreed by the examining division, the board cannot accept the appellant's position that these claims have not been amended by the applicant, but by the examining division. It may well be, as submitted by the appellant, that to a great extent the primary examiner drafted the claims during the personal consultation on 17 July 1995. This does, however, not justify the appellant's conclusion that the amendments were not made by him. As stated in the written result of the personal consultation and confirmed in the appellant's letter of 17 October 1995 (page 1, last paragraph), the set of claims 1 to 6 was worked out during that consultation. Since this set of claims was the result of the personal consultation and no other requests were submitted, evidently the appellant's request was for the grant of a patent on the basis of these claims. Accordingly, the result of the personal consultation states that the applicant is requested to file clear copies of the claims and to adapt the description. According to the consistent practice of the EPO (see Guidelines for Examination in the EPO C-VI, 3.10), the drafting of the claims is the responsibility of the applicant. Whereas the examiner may suggest an acceptable form of amendment to overcome any deficiencies, he cannot require the applicant to amend the application in a particular way. The applicant may or may not follow any suggestion by the examiner. He may also take it as a basis for an auxiliary request provided that he maintains a

different version as his main request. It is the applicant who decides on which basis the examining division has to take a decision (Article 113(2) EPC). By not maintaining or submitting another request during the personal consultation, the appellant accepted that the examining division proceeded on the basis of the set of claims worked out in the personal consultation as the only request. It should be emphasized that even this set of claims resulting from discussion and amendments made during the personal consultation was already dependent on the consent of the examining division.

2.3 In general it is up to the examining division to exercise its discretion according to Rule 86(3) EPC, when the admissibility of an amendment submitted after answering to the examining division's first communication is at issue. When deciding whether or not to allow a request for amendment at an advanced stage of the procedure, in the exercise of its discretion under Rule 86(3) EPC, an examining division is required to consider all relevant factors which arise in a case. In particular, it must consider both the applicant's interest in obtaining a patent which is legally valid, and the EPO's interest in bringing the examination procedure to a close, and must balance these interests against one another (G 7/93, OJ EPO, 1994, 775; Reasons, point 2.5).

2.4 If a first instance department is required under the EPC to exercise its discretion in certain circumstances, such a department should have a certain degree of freedom when exercising that discretion, without interference from the boards of appeal (G 7/93,

supra, Reasons, point 2.6). However, in the present case the first instance department in its decision has not exercised its discretion in accordance with the principles set out in section 2.3 above, since the claim 1 proposed for grant in the Rule 51(4) EPC communication in fact contravenes Article 123(2) EPC and a patent based on such a claim would not be legally valid, so that the examining division had to accept the filing of a set of modified claims, i.e. the claims filed with letter dated 17 October 1995.

3. *Allowability of the amendments made during the personal consultation, with regard to Article 123(2) EPC*

3.1 Claim 1 filed on 17 July 1995 (see above section II) and accepted by the examining division comprises the amended feature [3] according to which a vehicle acceleration detecting means (63) for detecting the vehicle acceleration (G) is provided.

However, a vehicle acceleration detecting means in this general version, which for instance may include a speed change detector on a vehicle wheel, is nowhere disclosed in the originally filed application. According to the description page 15, line 24 to page 16, line 3 a G-sensor (63) is provided at a lower portion of a dash board of the rear seat so as to detect the acceleration (vehicle G) of the motor vehicle in the forward and backward directions. The importance of the acceleration degree of the vehicle G and the specific sensor for detecting the acceleration thereof (vehicle G-sensor) is further mentioned on pages 22 (lines 14 and 15), 29 (lines 14 and 15), 36 (lines 7 to 9) and 39 (lines 21 and 22) of the

description. Thus on page 36 cited in the decision of the examining division, only a specific G-sensor is indicated for detecting the acceleration G.

Therefore, the feature [3] of claim 1 in the general meaning proposed during the interview on 17 July 1997 is not disclosed in the originally filed application (Article 123(2) EPC).

- 3.2 The agreed claim 1 (see above section II) further comprises the amended feature 6.2 according to which a torque correcting means is present for correcting the torque estimated by said torque estimating means based on the respectively detected vehicle acceleration (G) in a direction which prevents the occurrence of vehicle hunting.

This feature, in its normal understanding, confirmed by the appellant during the oral proceedings, implies that for each different detected vehicle acceleration a specific correction is foreseen, i.e. the correction is a function of the detected vehicle acceleration.

Although it is disclosed on page 36 that a more preferable controllability can be realized with learning and that as the learning method the acceleration G in the forward and backward directions of the motor vehicle is detected by means of a G-sensor to calculate the hunting period to be reflected to the natural frequency f_0 (also see Figure 23, steps 6000 to 6003), it is nowhere unambiguously clearly disclosed that the thus determined natural frequency f_0 is used as a basis for correcting the estimated torque and therefore that the torque correcting means are based on

the respectively detected vehicle acceleration. Furthermore, apart from the undefined use of the calculated value f_0 in Figure 23, it has to be emphasized that the natural frequency f_0 is a function of T_H , i.e. a function of a parameter, which is first of all a time parameter instead of an acceleration value, and secondly is a parameter which takes into account the past or the history of the vehicle, namely previous hunting periods (T_1 , T_2 and T_3), instead of the actual detected value of the vehicle acceleration. Furthermore, only the fact that a calculated value (AG) based on the detected G , is larger than a specific value, is important to start the calculation of f_0 . This cannot be considered as implying that f_0 is a function of the "respectively detected vehicle acceleration". The natural frequency (hunting frequency) f_0 therefore varies due to the environment variation, variation of the engine or vehicle with passage of time. In this respect, the appellant confirmed in the oral proceedings before the board that the statement on page 36 "a more preferable controllability can be realized with learning" must be interpreted such that the obtained natural frequency f_0 is used for adjusting values which vary with the passage of time and not for correcting purposes in the meaning of feature 6.2 of claim 1.

- 3.3 The examining division also cited in its decision with regard to the amendments of the features of claim 1 the description page 20, line 20 to page 21, line 4, and page 22, lines 8 to 21. In the passage bridging pages 20 and 21 it is described that a necessary torque of the engine is estimated on the basis of the accelerating amount A_p and the engine speed N_e . According

to page 22, "it is considered that the signal indicative of the acceleration pedal operating amount A_p which represents the rapid acceleration operation due to the driver is arranged to become less steep ...". These description passages are clearly related to the movement of the acceleration pedal and not to the acceleration (G). Indeed, where an acceleration value is considered as being an actual obtained value (the so called Ist-Wert) the accel-operating amount or the accel-opening amount is considered as indicating a value desired by the driver (so called Soll-Wert).

It is true that the target torque T_F calculated by correcting an estimated torque T_T (see Figure 2, step 1040) is of importance when the acceleration or deceleration operation is carried out (see page 21, lines 4 to 18) and the gas pedal is rapidly actuated (page 22, line 8 to page 23, line 2; and page 30, lines 10 to 21), but it cannot be derived from these passages cited in the examining division's decision that the torque correcting means are based on the respectively detected vehicle acceleration (G).

Therefore, the proposed feature [6.2], (see above section II) of the allowed claim 1, also is not disclosed in the originally filed application (Article 123(2) EPC).

Although not mentioned by the examining division, the application specifies "an acceleration state detecting means" but this feature detects the acceleration state of the engine (see page 8, lines 13 and 14 and claim 35 as originally filed).

3.4 Claim 1 as worked out during the interview on 17 July 1995 therefore contravenes Article 123(2) EPC.

3.5 Furthermore, in claim 4 as allowed by the examining division, it is stated that "said specific frequency and/or said damping factor is/are determined on the basis of the vehicle acceleration (G)".

In the originally filed application it is nowhere disclosed that the damping factor \tilde{n} is determined on the basis of the vehicle acceleration.

Also this claim 4 is not in accordance with Article 123(2) EPC.

4. Since the amendments, which have led to the set of claims agreed by the examining division do not satisfy the requirements of Article 123(2) EPC, the case is remitted to the first instance for further prosecution.

The starting basis for the further examination is the claims 1 to 6 as filed by the appellant with the letter dated 17 October 1995.

5. *Request for reimbursement of the appeal fee*

Although the application in the version agreed by the examining division is not in accordance with the EPC because of the above stated reasons, the appellant apparently cooperated during the personal consultation to come to said version, which was the sole one at the end of that consultation. Since the appellant was at least informed before the personal consultation took place, by the minutes of a consultation by telephone on

6 July 1995 about the necessary amendments in claim 1 and about the necessity to name at least one essential parameter, he had, in order to be well prepared, to know the essential parameters necessary in claim 1 and had to take care to prevent the introduction of a wrong parameter. In the personal consultation, however, no proposal of another operation parameter instead of the detected vehicle acceleration was apparently brought forward by the appellant. Even the request made at the beginning of the oral proceedings before the board was still based on the assumption that the specific frequency and/or the damping factor is/are determined on the basis of the vehicle acceleration, which is reflected in claim 4 of the main request. Therefore, the mistake made was not only made by the examining division, which might have been misled by the version of the main request, but also by the appellant. Since a wrong interpretation by the examining division of the disclosure of the application and of the arguments brought forward by the appellant cannot be considered as a substantial procedural violation, and the version of the claims at the end of the personal consultation was the basis of the appellant's request, the board concludes that a reimbursement of the appeal fee is not equitable, so that the request for reimbursement of the appeal fee must be rejected.

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.
3. The request for reimbursement of the appeal fee is refused.

The Registrar:

The Chairman:

G. Magouliotis

C. Andries