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D E C I S I O N
of 10 December 1996

Case Number: T 0585/95 - 3.2.1

Application Number: 91200147.6

Publication Number: 0443644

IPC: B60K 31/00

Language of the proceedings: EN

Title of invention:
Adaptive cruise control system

Patentee:
GENERAL MOTORS CORPORATION

Opponent:
Siemens AG

Headword:
-

Relevant legal provisions:
EPC Art. 56, 111(1), 114(2)

Keyword:
"Late submitted material - document admitted (yes)"
"Decision re appeals - remittal (yes)"

Decisions cited:
T 0164/89, T 0273/84, T 0326/87, T 0611/90

Catchword:
-

Case Number: T 0585/95 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 10 December 1996

Appellant: Siemens AG
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Respondent: GENERAL MOTORS CORPORATION
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 02 June 1995
rejecting the opposition filed against European
patent No. 0 443 644 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: F. J. Proels
Members: P. Alting Van Geusau
A. C. G. Lindqvist

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 443 644 in respect of European patent application No. 91 200 147.6, filed on 25 January 1991, and claiming priority from US application No. 481261, filed on 20 February 1990 in the United States of America, was published on 3 November 1993.

II. Notice of opposition was filed on 28 July 1994 on the grounds of Article 100(a) EPC. In respect of an alleged lack of inventive step the opposition was supported by the documents

D1: US-A-4 706 195

D2: DE-C-3 304 620 and

D3: DE-C-2 846 873

III. By a decision which was given at the end of oral proceedings held on 16 May 1995 and issued in writing on 2 June 1995 the Opposition Division rejected the opposition.

The Opposition Division was of the opinion that, starting from the closest prior art as represented by D2, neither D1 nor D3 could give the skilled person a lead to a speed control system having the possibility to adapt the alert distance by the driver to his personal driving habits and that for this reason any combination of the features disclosed in the prior art documents D1 to D3 would not result in the adaptive cruise control system according to the independent

claim 1 or in the method of controlling the distance to an obstructing vehicle according to the independent claim 7.

- IV. On 12 July 1995 a notice of appeal was lodged against that decision together with filing of the statement of grounds of appeal and payment of the appeal fee. With the statement of grounds the appellant cited the further prior art document

D4: US-A-4 075 892

- V. In a communication issued in preparation of oral proceedings, auxiliarily requested by both parties, the Board expressed the provisional opinion that document D4 did not appear to be more relevant than the documents already on file and that therefore in accordance with the case law of the Boards of appeal and the provisions of Article 114(2) EPC it was envisaged to disregard this document.

It was further observed that a manual setting of the driver reaction time appeared to be neither disclosed nor hinted at in the available prior art and that therefore the main issue to be discussed at the oral proceedings was the question by what other considerations the skilled person might be led in an obvious manner to the subject-matter of the patent in suit.

- VI. In a letter dated 5 November 1996 the appellant cited

D5: DE-C-3 438 632

as further support for its argument for lack of inventive step of the subject-matter of the patent in suit.

VII. Oral proceedings were held on 10 December 1996.

During the oral proceedings the respondent filed amended claims 1 to 12 of which the independent claims 1 and 7 read as follows:

"1. An adaptive cruise control system for controlling the distance of a source vehicle (10) to an obstructing vehicle (12) comprising a velocity sensor (20) for sensing the velocity (V_s) of the source vehicle; a distance sensor (22, 24) for sensing the distance (D_A) from the source vehicle to the obstructing vehicle; and control means (14) for adjusting the velocity of the source vehicle to the source vehicle command velocity (V_c); characterised by comprising means (25) adjustable by a driver of the source vehicle independent of vehicle operating conditions for providing a signal representative of a driver reaction time (T_r); processing means (18) for determining an alert distance (D_{alert}) as a function of the velocity (V_s) of the source vehicle and the driver reaction time (T_r), for determining a desired distance (D_d) of the source vehicle to the obstructing vehicle as a function of the alert distance (D_{alert}) and a preset distance (X), and for determining a source vehicle command velocity (V_c) suitable for establishing the desired distance (D_d)".

"7. A method of controlling the distance of a source

vehicle (10) to an obstructing vehicle (12) comprising the steps of sensing the velocity (V_s) of the source vehicle; sensing the distance (D_A) from the source vehicle to the obstructing vehicle; and adjusting the velocity of the source vehicle to the source vehicle command velocity (V_c); characterised by the driver providing a signal which is adjustable and representative of a driver reaction time (T_r) independent of vehicle operating conditions; determining an alert distance (D_{alert}) as a function of the velocity (V_s) of the source vehicle and the driver reaction time (T_r); determining a desired distance (D_D) of the source vehicle to the obstructing vehicle, as a function of the alert distance (D_{alert}) and a preset distance (X); determining a source vehicle command velocity (V_c) suitable for establishing the desired distance (D_D)".

The appellant filed during the oral proceedings document DE-A-3 438 632 (D6) which was the published application document of D5, a patent which has been published after the priority date of the patent in suit. The appellant declared that D4 should not be further considered.

The appellant requested that the decision under appeal be set aside and that the patent be revoked, taken into account the prior art disclosed in D2 and D3.

Auxiliarily the appellant requested that DE-A-3 438 632 (D6) be allowed into the proceedings and that the patent be revoked taking into account D6 and the further prior art.

The respondent (patentee) requested that the appeal be dismissed and the patent be maintained with the amended claims as submitted during the oral proceedings. The respondent further requested that D6 should not be admitted into the proceedings and if it were, the case should be remitted to the first instance for further prosecution.

VIII. In support of its requests the appellant essentially relied upon the following submissions:

If, compared to the granted claims, the subject-matter of the amended claims was restricted by features not contained in any of the granted claims, then, as a matter of fairness, the appellant should be given the possibility to cite further material against the new subject-matter of the claims. Having regard to these circumstances, D5 and D6, documents disclosing a manual setting of the driver's reaction time, were not late-filed in the meaning of Article 114(2) EPC and anyhow should be allowed into the proceedings because of their relevance.

D5 was found by chance when dealing with another file with similar subject-matter and was sent to the EPO without any delay. The late citing of this document did therefore not amount to an abuse of procedure.

Even when having regard only to D2 and D3 the subject-matter of the present independent claims 1 and 7 was not based on an inventive activity.

When compared to the closest prior art disclosed in D2 the subject-matter of the present independent claims differed essentially in that in the calculation of the desired distance account was taken of a driver reaction time and that the driver reaction time could be adjusted by the driver.

D2 already disclosed that the desired safety distance was based on the sum of a preset distance and a distance depending on road circumstance variables. An alarm was given in case the desired distance became too short.

The skilled person looking for an improvement of the known solution with a view to avoiding too many alarm situations would certainly consider D3 because this document related to a safety distance surveillance system for vehicles with a view to avoiding alarm situations (column 1, lines 32 to 36). In this system the desired safety distance was calculated taking into account the driver reaction time which was influenced by the vehicle light switch so as to have a greater value at night than during daytime. Moreover, it was shown in Figure 4 of D3 that the reaction time could also be adjusted by a potentiometer VR₇, which, taking also into account the teachings of claim 15 of D3, would immediately lead the skilled person to the concept of an adjustable reaction time setting. Therefore, the skilled person would find all the necessary details in D3 to arrive in an obvious manner at the subject-matter of claims 1 and 7, which subject-matter thus lacked an inventive activity.

If the Board could not accept the appellant's interpretation of D3, at least D6 undisputedly disclosed a manual setting of the driver reaction time and therefore the combination of the teachings of D2 and D6 would lead in an obvious manner to the subject-matter of the independent claims 1 and 7.

IX. The respondent disputed the appellant's view and its arguments may be summarised as follows:

The new independent claims 1 and 7 related in their precharacterising part to the closest prior art as represented by D2.

D3 concerned a safety control and thus related to an entirely different technical field than D2 and the present patent, which both related to adaptive cruise control systems. Already for this reason the skilled person would not be led to combine teachings of D2 and D3.

But even if the skilled person did combine the teachings of D2 and D3 he would not arrive at the subject-matter of claims 1 and 7 because D3 did neither disclose nor give a hint to an adjustment of the driver reaction time which was independent of vehicle operating conditions. In this respect it was apparent to the skilled person that the potentiometer VR₇ in D3 was for factory setting purposes only.

D5 and D6 were filed after the 9 month period stipulated in Article 99 EPC and were therefore late-filed and should be ignored.

If the Board nevertheless decided to admit D6 into the proceedings the case should be remitted to the first instance to give the respondent the possibility of having the case considered by two instances.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

2.1 When compared to the granted claims the independent claims 1 and 7 now additionally contain that the adjustment of the driver reaction time is independent of the vehicle operating conditions.

Furthermore, method claim 7 now contains the feature that the driver himself provides a signal which is adjustable and representative of the driver reaction time.

The dependent claims 2 to 6 and 8 to 12 remain unchanged.

2.2 Although the wording "independent of vehicle operating conditions" is not found in the application as originally filed it is immediately clear that a manual setting of the driver reaction time such as disclosed in the present patent and its original application document is independent of the vehicle operating

conditions and that such further specification is therefore implicit to the skilled person when taking into account the entire content of the application as filed.

The additional specification in method claim 7 concerning the driver providing a signal which is adjustable and representative of a driver reaction time is effectively the same as the definition of this feature in the originally filed apparatus claim 1 and this amendment brings the claimed invention as defined in the two independent claims in line with each other.

- 2.3 It is to be noted that the appellant raised objections as to the allowability of the amendments, both as regards support in the originally filed application documents and the late stage of the proceedings at which the amendment was filed. The appellant argued that the exact wording of the amendments was not disclosed in the application documents.

Such a restriction of amendments is, however, not required by Article 123(2) EPC. Furthermore, in accordance with the case law of the Boards of appeal, amendment of claims may also be allowed at a late stage of the proceedings if they deal with objections from the Board of appeal or the opponent and are clearly formally allowable.

In the present case the amendments concerned mainly the limitation of the claimed subject-matter to include in an unambiguous manner that the driver reaction time itself may be directly adjusted by the vehicle operator, which subject-matter formed the basis for the respondent's arguments in support of inventive step in both the opposition- and present appeal proceedings.

In view of the apparency of the respondent's intentions the appellant could thus have expected a limitation of the independent claims in the present or similar form, even considering that the exact wording was not explicitly derivable from any of the granted dependent claims.

- 2.4 For the above reasons the amended set of claims 1 to 12 are formally allowable.

THE APPELLANT'S MAIN REQUEST

3. *Novelty*

Novelty of the subject-matter of the independent claims 1 and 7 follows from the fact that none of the available prior art documents discloses an adaptive cruise control system or method in which the driver can influence the desired distance of the source vehicle to an obstructing vehicle by adjustment of a driver reaction time.

Novelty was in fact not in dispute in the proceedings.

4. *Inventive step*

- 4.1 There is agreement between the parties and the Board that D2 represents the closest prior art.

This document discloses an adaptive cruise control system for and a method of controlling the distance of a source vehicle to an obstructing vehicle comprising the combination of features set out in the precharacterising part of the system of claim 1 and 7.

In this known system for and method of controlling the trailing distance the value of the trailing distance is calculated on the basis of the vehicle speed and experimentally determined constants which constants may differ in accordance with the driving circumstances such as whether the road surface is dry or wet (see Figure 5 of D2). Moreover an alarm is given when the actual distance between the vehicles becomes shorter than the calculated trailing distance.

- 4.2 In this known system and method the trailing distance is calculated in accordance with the predetermined constants and does not take into account varying traffic conditions, other than dry or wet road surfaces, or the personal driving habits of the vehicle operator.

The present patent seeks to provide an improved cruise control system in which such limitations are alleviated (see column 1, lines 29 to 36 of the patent in suit).

- 4.3 Although D3 does not directly relate to a cruise control system or method but rather to a safety control

system for a vehicle, this known system is based on determining and monitoring the distance from the vehicle to an obstructing object such as a preceding vehicle (see column 1, lines 1 to 31), and also on the consequences of the different road and weather conditions for maintaining a sufficient safety distance.

Therefore, when considering possible improvement of the cruise control system and method disclosed in D2, in which monitoring a safety distance and weather influences on the calculation of the desired safety distance play an important role, the prior art disclosed in D3 would certainly be taken into account by the skilled person when trying to improve weather dependent control in the cruise control known from D2.

For this reason the Board does not share the respondent's opinion that the skilled person would not combine the teachings of D2 and D3.

- 4.4 D3 teaches that the safety distance (the trailing distance) should be calculated not only in accordance with the vehicle speed and braking conditions but also by taking into account the vehicle operator's reaction time (see column 3, lines 4 to 20).

In a preferred embodiment of the invention disclosed in D3 the reaction time factor is made dependent on the position of the light switch so as to increase the reaction time factor (T_d) at night (see column 4, lines 12 to 21).

Therefore, when applying the teachings derived from D3 to the cruise control disclosed in D2 the skilled person might be led to take the driver reaction time into account for the calculation of the desired trailing distance and might also increase the reaction time constant when the vehicle light switch is actuated.

However, such a system or method does not comply with the system and method defined in the amended claims 1 and 7 of the patent in suit mainly because the driver reaction time factor is not adjustable **independently** of the vehicle operating conditions.

- 4.5 The appellant considered that the potentiometer VR7 shown in Figure 4 and claim 15 of D3, in particular the statement in this claim that the reaction time factor was dependent upon the changes of the driver's and/or weather conditions, clearly suggested adjustability of the driver reaction time factor by the driver.

However, considering the details of the electrical system of D3 and having regard to the entire text of claim 15, the Board cannot find any objective technical support for the appellant's allegations.

In fact the electrical circuit of D3 contains a number of potentiometers (VR2 - VR7) and in the absence of a disclosure or hint for control of any of these potentiometers by the driver the potentiometers are considered to be mere trim-potentiometers which are preset at the factory in order to set the desired circuit properties within the required tolerances.

In accordance with claim 15 a compensator provides a signal for correction of the reaction time and in view of the fact that the compensator disclosed in D15 takes account of vehicle operating conditions only, the appellant's interpretation of claim 15 is considered to be based on hindsight rather than on objectively verifiable facts.

- 4.6 In summary, the Board concludes that the subject-matter of the independent claims 1 and 7 cannot be derived in an obvious manner from the prior art disclosed in D2 and D3.

THE APPELLANT'S AUXILIARY REQUEST

5. *Procedural considerations*

- 5.1 Document D5 was cited after the 9 month period stipulated in Article 99 EPC and the corresponding prior art application document D6 was filed as late as during the oral proceedings on 10 December 1996.

Thus, D6 was not submitted in due time either and in accordance with the case law of the Board's of appeal the circumstances of the late filing and the relevance of the document to the decision to be taken must be considered first before deciding whether this document should be admitted into the proceedings.

Because D5 is not a prior art document it is not relevant and must be disregarded.

5.2 The appellant explained during the oral proceedings that D5 was found accidentally when dealing with another case and that, when citing the document in the present proceedings, it was overlooked that D5 was published after the filing date of the present patent.

However, the published application document (D6) of the granted patent (D5) relates to the same subject-matter as the granted patent, and therefore the filing of D6 during the oral proceedings was merely a correction of the filing of the wrong version of a document rather than the introduction of a totally new citation, since the respondent could have foreseen the filing of D6 because it is immediately clear from the information printed on the front page of D5 that the earlier application document of D5, i.e. D6 was published before the priority date of the present patent.

5.3 The Board sees no reason to doubt the appellant's explanations of the late citing of D5 and D6 and there is also no other reason to assume an abuse of procedure.

5.4 Having examined D6 in accordance with Article 114(1) EPC the Board considers it to be highly relevant for judging the patentability of the subject-matter of the patent, in particular since this is the only available document disclosing a manual setting of the driver reaction time independent of vehicle operating conditions in a system that might be used to maintain a predetermined safety distance.

Because of its relevance the document has to be

admitted into the proceedings (see also T 0164/89, point 2).

- 5.5 If a document is cited for the first time during the appeal proceedings and it is admitted because of its relevance, in accordance with the case law of the Boards of appeal the case is normally to be remitted to the department of first instance so as to make it possible for the new evidence to be examined at two levels of jurisdiction (see for example T 0273/84, OJ 1986, 346).

Under the present circumstances the Board considers that it should make use of its discretion under Article 111(1) EPC and exercise its power to decide to remit the case to the first instance for further prosecution.

- 5.6 In a number of decisions by different Boards of appeal it was decided that the late filing of a relevant document by one party could give rise to an apportionment of costs (Article 104(1) EPC) in the other party's favour for reasons of equity (see T 0326/87, OJ 1992, 522, reasons point 2.3 and T 0611/90, OJ 1993, 50, reasons point 5).

It is to be noted that an earlier request for apportionment of costs by the respondent in response to the citing of D4 was not any longer maintained at the oral proceedings.

Considering further that the present set of claims, filed during the oral proceedings, contains amendments which were not directly apparent from the granted set

of claims and that under such circumstances the appellant must be given a chance to consider and respond to the amendments made, the Board sees in the present case no reasons of equity which would justify an apportionment of costs in the respondent's favour.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. Document DE-A-3 438 632 (D6) is admitted into the proceedings.
3. The case is remitted to the Opposition Division for further prosecution on the basis of claims 1 to 12 filed during the oral proceedings held on 10 December 1996.

The Registrar: The Chairman:

S. Fabiani

F. Pröls