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Datasheet for the decision of 11 July 2013

Case Number: T 1198/10 - 3.2.06

Application Number: 04020841.5

Publication Number: 1512851

IPC: F01N 5/02, B60H 1/18

Language of the proceedings: EN

Title of invention:
Method for controlling a valve for an exhaust system

Patent Proprietor:
Arvin Technologies, Inc.
Faurecia Emissions Control Technologies, USA, LLC

Opponent:
BEHR GmbH & Co.
-Patentabteilung-

Relevant legal provisions:
EPC 1973 Art. 54, 56

Keyword:
Novelty - (yes)
Inventive step - (yes)

Decisions cited:
G 0007/93, G 0009/91, T 0609/99

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Case Number: T 1198/10 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 11 July 2013

Appellant: (Opponent)	BEHR GmbH & Co. -Patentabteilung- Mauserstrasse 3 D-70469 Stuttgart (DE)
Representative:	Grauel, Andreas Grauel IP Patentanwaltskanzlei Presselstraße 10 D-70191 Stuttgart (DE)
Respondent: (Patent Proprietor 1)	Arvin Technologies, Inc. 2135 West Maple Road Troy, MI 48084-7186 (US)
Respondent: (Patent Proprietor 2)	Faurecia Emissions Control Technologies, USA, LLC Corporation Trust Center 1209 Orange Street Wilmington, DE 19801 (US)
Representative:	Prinz & Partner Patentanwälte Rundfunkplatz 2 D-80335 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 20 April 2010 concerning maintenance of the European Patent No. 1512851 in amended form.**

Composition of the Board:

Chairman:	M. Harrison
Members:	G. Kadner
	W. Sekretaruk

Summary of Facts and Submissions

I. The mention of grant of European patent No. 1 512 851, with 10 claims, on the basis of European patent application No. 04020841.5 filed on 2 September 2004, and claiming a US priority of 5 September 2003, was published on 3 January 2007.

II. Notice of opposition was filed against the granted patent by the opponent, and revocation of the patent on the ground of Article 100(a) EPC (lack of novelty and lack of inventive step) was requested.

Claim 1 reads as follows (adopting a feature split generally in accordance with that used in the decision under appeal):

"A method for controlling a valve (10) in an exhaust gas heat exchanger system of a combustion engine, the system

(a1) comprising a heat exchanger duct (5) with a heat exchanger (7) and a bypass duct (9)
(a2) operable to bypass the heat exchanger (7),

the method comprising the following steps:

(b) determining that heat is to be transferred from exhaust gas flowing through the exhaust system to the heat exchanger (5);
(c) switching the valve (10) into a first position in which the entire exhaust gas flows through the heat exchanger duct (5);
(d) monitoring by direct or indirect means a pressure drop across the heat exchanger system;

(e1) switching the valve into an intermediate position if the pressure drop reaches a predefined limit,
(e2) the intermediate position resulting in a first portion of the exhaust gas flowing through the heat exchanger duct (5) and a remaining portion flowing through the bypass duct (9), thereby reducing the pressure drop across the heat exchanger system;
(f1) switching the valve into a second position if the pressure drop again reaches a predefined limit,
(f2) the second position resulting in a second portion of the exhaust gas flowing through the heat exchanger duct (5),
(f3) the second portion being smaller than the first portion, thereby further reducing the pressure drop across the heat exchanger system."

With its interlocutory decision posted on 20 April 2010, the opposition division found that account being taken of the amendments made by the patent proprietor during the opposition proceedings, the patent and the invention to which it related met the requirements of the Convention. The opposition division held that the method according to auxiliary request 1 was novel and involved an inventive step when compared with the cited prior art documents, in particular:

D1: EP-B-0 885 758
D2: FR-A-2 776 015
D4: US-A 6 155 042
D10: GB-A-2 301 177

The opposition division concluded further that from the evidence D10 to D12 filed later in the proceedings, the documents

D11: DE-A-195 00 474 and
D12: DE-A-198 17 341

were *prima facie* not relevant and it did not admit them into the proceedings under Article 114(2) EPC.

III. Notice of appeal was filed against this decision by the appellant (opponent) on 27 May 2010, and the appeal fee was paid on the same day. With its grounds of appeal filed on 26 August 2010 the appellant pursued its request for revocation of the patent and filed:

D13: Hütte, Die Grundlagen der Ingenieurwissenschaften, 29. Aufl., 1991, pages 12 to 17.

IV. With letter dated 27 April 2011 and its reply to the appeal of 6 May 2011, the respondent (patentee) requested that the appeal be rejected and maintained its auxiliary request 2 filed during opposition proceedings before the opposition division.

V. In a communication accompanying the summons to oral proceedings, the Board expressed its preliminary view that it considered the opposition division's use of its discretion not to admit D11 and D12 to have been correct, and that although novelty in respect of D4 and D10 might require discussion, the subject-matter of claim 1 appeared to be novel. In respect of inventive step the Board did not see a reason to conclude differently to the opposition division. In regard to the appellant's attack against inventive step based on D1 and D2, the Board stated that no argument had been brought forward expressly by the appellant with reference to Article 12(2) of the Rules of Procedure of the Boards of Appeal (RPBA), and the Board had thus

been presented with no reason to conclude differently than the opposition division on that matter.

VI. Oral proceedings were held before the Board on 11 July 2013.

The appellant (opponent) requested that the decision under appeal be set aside and that the European patent No. 1 512 851 be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed.

VII. The arguments of the appellant can be summarized as follows:

D11 and D12 should be admitted into proceedings, as they were highly relevant *prima facie* to at least the issue of inventive step. They had already been filed in the opposition proceedings before the opposition division and should have been accepted then because they had been filed in reaction to the preliminary opinion of the opposition division sent together with the summons to oral proceedings. Since both novelty and inventive step of the claimed subject-matter had provisionally been considered to be present in that communication, an additional search was necessary whereby documents D10 to D12 had been found.

Even if the Board found that the documents were not already in proceedings, the documents had been re-filed on appeal so as to then be in the appeal proceedings, which was justified because they had not been filed late during the opposition proceedings and the criteria to be adopted in such a case was the relevance of the

documents as stated in T609/99, even where the opposition division had not admitted them.

The method according to claim 1 lacked novelty when compared with the disclosure of D4 as well as D10.

In regard to D10, since the patent itself stated that the stream of exhaust gas in the heat exchanger system could be controlled by using a plurality of intermediate positions (paragraph [0011]), this meant a continuous or quasi-continuous control. The structure of the heat exchanger system of D10 was identical to that claimed. According to D10 (page 2, line 7) the bypass duct was "at least partially" closed which meant that it could be fully closed. As a result, the bypass duct was fully closed in a first step and then progressively opened with rising back pressure. Since the patent in suit did not exclude such a continuous control the method of claim 1 was the same as that of D10.

In respect of D4 the appellant relied on its written submissions according to which the bypass duct was controlled by two valves which worked in dependence on the pressure drop. The patent did not exclude the use of more than one valve, and the use of a plurality of valves together functioned in the same way as the claimed method, particularly step (d). Therefore the skilled person would recognize the prior art as novelty-prejudicial.

At least the claimed method did not involve an inventive step. As was shown by D13, a document proving the general knowledge of the skilled person, "Steuerung" (open loop control) and "Regelung" (closed-loop control) would be used by the skilled person in

alternative applications where desired. Therefore, when trying to simplify the method disclosed in D10, the skilled person would, based on this general knowledge, replace the closed-loop control by an open-loop control, thereby arriving at a method having the steps of claim 1, without the involvement of an inventive step. Since in D10 (page 7, line 17) the back pressure was used as a control parameter, the skilled person would, without any difficulty, be able to derive a pressure drop in the heat exchanger from the back pressure which was measured in a suitable way.

The subject-matter of claim 1 lacked an inventive step over D1 and D2 respectively in combination with the knowledge of the skilled person, due to reasons presented in the opponent's opposition.

VIII. The respondent argued that the method was novel when compared with the teachings of D10 since that document did not disclose features (c) and (d). According to the description of D10 (page 2, lines 5 to 7) the bypass duct was progressively at least partially closed; no clear and unambiguous disclosure was present that the valve was closed into a first position in which the entire exhaust gas flowed through the heat exchanger. There was also no monitoring of the pressure drop across the heat exchanger, and from the back pressure within the whole system a pressure drop across the heat exchanger could not be derived in any meaningful manner.

D4 related to a method in which the back pressure was controlled such that the heat exchanger had a higher efficiency. This document neither disclosed monitoring of the pressure drop across the heat exchanger nor

switching of the valve into a second position if the pressure drop reached a predefined limit.

D11 and D12 should not be admitted into proceedings, as they were not *prima facie* relevant for the consideration of inventive step.

The claimed method was inventive since the skilled person having general knowledge in this technical field would not replace a closed-loop control system by an open-loop control without any indication from their own general knowledge or from the prior art. Any hint towards such a change in the mode of control was lacking. Additionally, none of the prior art documents disclosed the step of monitoring the pressure drop across the heat exchanger system. Even if the skilled person would read D10 (page 4, lines 19 to 20), stating that the gas flow was distributed in favour of the control duct, no control step was present putting the valve into a predetermined position.

Reasons for the Decision

1. The appeal is admissible.

2. *Non-admittance of D11 and D12*

2.1 Although the appellant argued that D11 and D12 should already be in proceedings or, if not, should then be admitted into the appeal proceedings, the Board decided not to admit these for the following reasons.

2.2 In its communication sent prior to oral proceedings, the Board had already expressed its preliminary opinion that the opposition division correctly exercised its discretion in not admitting these documents into

proceedings, based on its conclusion, which was reasoned in the decision, that they were found not to be sufficiently relevant. The argument offered by the appellant that, due to the opposition division's communication prior to oral proceedings provisionally considering novelty and inventive step to be present, whereby it had needed to conduct a further search, has little relevance here. Not only does a provisional opinion by an opposition division concerning documents on file not immediately give rise to any justification for performing a search to find further documents, but the opposition division anyway did not exclude D11 and D12 merely on the basis of their filing at a late stage of proceedings, but specifically due to their lack of relevance.

Also, when considering the subject-matter of claim 1, they indeed do not disclose more features than other documents on file, in particular not "an intermediate position" and "a second position" providing specific first and second portions of exhaust gas flowing through the heat exchanger and the bypass duct.

2.3 Although D12 discloses an intermediate position ("Zwischenstellung" (col. 3, line 68)), it is not further explained how this position is to be controlled. In D11 the pressure drop is controlled digressively depending on the volume flow through the heat exchanger, and upon reaching a certain limit the flow is stopped (claims 1 and 2). This limit however is an engine temperature dependent factor (claim 3) which has no relation to the pressure drop within the heat exchanger system. These documents thus lack all relevance to the issues of novelty and inventive step with respect to the subject-matter of the claims.

In its response subsequent to the Board's communication, the appellant did not contest the correct use of discretion by the opposition division, but argued instead simply that D11 and D12 were not only relevant to novelty but also to inventive step. However, the reasons already given above are not overcome by this argument, and the appellant supplied no further reason as to why the Board's preliminary opinion on this matter should indeed be altered. Thus, the Board remains of the opinion that the opposition division exercised its discretion correctly such that D11 and D12 were correctly not admitted into the proceedings.

2.4 The appellant's further line of argument that D11 and D12 should then be admitted into the appeal proceedings because they had been filed with the grounds of appeal is also not convincing. First, documents which have not been admitted into proceedings before an opposition division on the exercise of its discretion, which is subsequently found by the Board to be a correct exercise of discretion, cannot then normally be allowed into the proceedings during appeal either (see also G7/93, Reasons 2.6), since this would otherwise defeat the object of the exercise of the opposition division's discretion not to admit them. Appeal proceedings in an *inter partes* case are not intended to be an opportunity simply for continued examination of an opposition, but instead are mainly to give the losing party a possibility to challenge the decision of the opposition division on its merits (see e.g. G9/91, Reasons 18).

The appellant cited T 609/99 in support of its case for admittance of D11 and D12. However, the facts of the case are quite different. In T 609/99 (see Reasons 2.2 and 2.3) the legal and factual framework of the

opposition proceedings was considered not to be enlarged, as the late-filed citation related to physical principles available to the skilled person which helped to promote convergence of the debate in that case, and for that reason the Board found it unreasonable not to admit it into the proceedings. In the present case, D11 and D12 clearly go outside the legal and factual framework existing on filing the opposition and no convergence of the debate has occurred, rather new lines of attack.

Lastly, the hurdle to have documents admitted at an even later stage (in appeal proceedings) is clearly such that the documents need to be *prima facie* highly relevant in the sense that revocation of the patent would be highly probable if the documents were admitted. This, is clearly not the case here as already evident from item 2.2. above, where this Board anyway explained that the documents were considered even not to be more relevant than documents already on file due to the fact that no more features were disclosed in D11 and D12 compared to the documents already on file.

3. *Novelty (Article 54 EPC 1973)*

3.1 In respect of D4 the appellant argued that, although this document disclosed a control of the exhaust gas flowing through the heat exchanger duct and the bypass duct by different valves, the method according to claim 1 did not exclude the use of two valves. Also, the heat exchanger caused a flow restriction leading to elevated back pressure, and there were a number of sensors detecting those parameters for controlling the valves by the control electronics. Thus the skilled person reading D4 would recognize that all the steps of

the claimed method were already disclosed in that prior art document.

3.2 Contrary to the appellant's assertion, the Board finds that in its decision, the opposition division concluded correctly that the method of claim 1 was novel when compared with D4. In D4 there is no explicit or implicit disclosure of monitoring by direct or indirect means a pressure drop across the heat exchanger system (feature (d)). In this regard it should be noted that the back pressure depends on several parameters such as the load of the engine and the flow distribution between the heat exchanger duct and the bypass duct, such that a change in the pressure across the heat exchanger system in the understanding of the skilled person cannot be derived from the measurement of the back pressure.

3.3 The appellant asserted that D10 related to a system for controlling the exhaust gas flow which had a structure identical to that used in the method claimed and it used the same method steps. Although the structure is similar to that shown in the patent, the Board finds that at least features (c) and (d) are not clearly and unambiguously disclosed in D10.

As regards feature (c), namely "switching the valve (10) into a first position in which the entire exhaust gas flows through the heat exchanger duct (5)", D10 discloses on page 2, lines 6 to 8 "... which method comprises progressively closing at least partially said bypass duct to divert at least a proportion of exhaust gasses through said heat exchanger ...". No indication is present that the valve is switched nor that it is brought into a fully closed position (which is required if the "entire" exhaust gas is to flow through the heat

exchanger duct; a matter which was not contested). In respect to feature (d), no disclosure can be derived, either explicitly or implicitly that a pressure drop is monitored by direct or indirect means across the heat exchanger system. The appellant relied on D10 (page 1, lines 5 to 9) according to which the flow through the ducts is controlled such that the pressure upstream of the valve is at a requisite level. However, a particular pressure drop in the heat exchanger duct is not identifiable from this back pressure because it depends on the engine load and the partially closed or opened valve controlling simultaneously both the heat exchanger duct and the bypass duct and not only distributing the gas flow between those two ducts as claimed.

4. *Inventive step (Article 56 EPC 1973)*

4.1 The appellant's attack against inventive step started from D10 as closest prior art. However, no objective problem underlying the subject-matter claimed was formulated by the appellant. The respondent saw the problem to be solved as being the provision of a simpler method of controlling a valve in an exhaust gas heat exchanger system for a combustion engine. The Board agrees with the problem formulated by the respondent.

4.2 The appellant asserted first that the structure of the control system according to D10 was similar to that of the patent. The skilled person having general knowledge in the technical field of controls would understand the indication given in D10 that the bypass duct was at least partially closed, in the sense that it could also be completely closed (page 2, lines 6 to 7). Further, since fully closing the valve did not require closed

loop control, an open loop control could be used. The introduction section in that document also clearly indicated that the upstream pressure of the valve played an important role in the control of the valve. The upstream pressure was measured by suitable means (page 7, lines 20 to 22), and in view of the availability of such sensors, the skilled person would allegedly also consider the measurement of the pressure drop across the heat exchanger as the same result would be achieved as with back pressure.

4.3 Applying the usual problem-solution approach, the Board cannot follow the appellant's argument. Even assuming that the skilled person were familiar with the different kinds of control, any indication in D10 or the further cited prior art documents is missing as to why the closed loop control used in D10 allowing the control of the valves in a variety of ways (page 7, line 14) should be replaced by a simpler open loop control without the exercise of inventive skill. Merely because two methods of control are known generally (as exemplified by D13, which was anyway not a matter of dispute *per se*), does not mean that one would necessarily be used to replace the other wherever desired.

According to D10 and the further cited documents D1 to D9 relating to the control of valves in exhaust gas heat exchanger systems, none of these indicates monitoring a pressure drop across the heat exchanger. Even assuming that the back pressure caused by the rising flow resistance within the heat exchanger necessarily had some influence on the total back pressure upstream of the control valve, no direct conclusion in respect of the pressure drop across the heat exchanger can be drawn from that resulting change

in the back pressure because there are further parameters having influence on the back pressure. Consequently none of the prior art cited teaches the monitoring of the pressure drop across the heat exchanger either directly or indirectly, let alone for the specific control purpose as claimed.

In regard to the appellant's attack against inventive step regarding D1 and D2, the Board had already stated in its communication issued before oral proceedings, with reference to Article 12(2) RPBA, that it had been presented with no express argument by the appellant in regard to the reasons given in the decision under appeal as to why this finding was incorrect. No reply was made by the appellant in that regard either in writing or at the oral proceedings. The Board thus confirms its provisional view that it concurs with the opposition division on this matter.

Therefore the Board concludes that the method according to claim 1 has to be considered as involving an inventive step. The dependent claims relate to particular embodiments of the invention and the Board has been given no reason independent to the argument against claim 1 as to why those claims could not also be maintained as granted.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

B. Atienza Vivancos M. Harrison

Decision electronically authenticated