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Datasheet for the decision of 12 August 2010

Case Number: T 0785/09 - 3.2.04

Application Number: 01303830.2

Publication Number: 1150006

IPC: F02M 65/00

Language of the proceedings: EN

Title of invention:
Arrangement for locating fuel leakage in connection with a combustion engine

Patentee:
Wärtsilä Finland Oy

Opponent:
Caterpillar Motoren GmbH & Co. KG

Headword:
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Relevant legal provisions:
-

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

Keyword:
"Main request - inventive step (no)"
"Auxiliary request - filed during oral proceedings - not admitted"

Decisions cited:
T 0644/07, T 0270/90

Catchword:
-

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Case Number: T 0785/09 **-** 3.2.04

D E C I S I O N
of the Technical Board of Appeal 3.2.04
of 12 August 2010

Appellant: (Opponent)	Caterpillar Motoren GmbH & Co. KG Falckensteiner Strasse 2 D-24159 Kiel (DE)
Representative:	Udo Preuss Kramer - Barske - Schmidtchen Landsberger Straße 300 D-80687 München (DE)
Respondent: (Patent Proprietor)	Wärtsilä Finland Oy Tarhaajantie 2 FI-65380 Vaasa (FI)
Representative:	Hendrik Wahl Zipse Habersack Kritzenberger Patentanwälte Wotanstrasse 64 D-80639 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted 10 February 2009 concerning maintenance of European patent No. 1150006 in amended form.**

Composition of the board:

Chairman: M. Ceyte
Members: M. Poock
T. Bokor

Summary of Facts and Submissions

I. In its interlocutory decision of 10 February 2009, the opposition division decided that European patent No. 1 150 006 as amended in the opposition proceedings met the requirements of the European Patent Convention.

II. The opposition was based on the opposition grounds of lack of novelty and lack of inventive step having regard to, *inter alia*, the following documents:

D1: GB-A-2 060 800;
D10: EP-A-0 507 191;
D15: Webster's Third New International Dictionary, page 1376.

In the notice of opposition it was contested that the subject-matter of claim 1 is new having regard to the embodiment of figure 4 of document D1. Prior to the oral proceedings before the opposition division, the opponent additionally referred to the combination of the teaching of document D1 with the skilled person's common general knowledge or the teaching of document D10 in support of its argument that the claimed subject-matter is not inventive.

III. The opponent lodged an appeal against this decision on 1 April 2009 and paid the appeal fee on the same day. The statement of grounds of appeal was received on 19 June 2009.

IV. Oral proceedings before the board of appeal took place on 12 August 2010.

The appellant (opponent) requested that the decision under appeal be set aside and that the patent No. 1 150 006 be revoked.

The respondent (proprietor) requested that the decision under appeal be set aside and that the patent be maintained in an amended form based on claim 1 of the main request filed during the oral proceedings, or in the alternative, on the basis of claim 1 of the first auxiliary request filed during the oral proceedings.

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

"A fuel injection system including an arrangement for locating a fuel leak for a large combustion engine, the fuel injection system comprising:

- a double wall fuel pipe system (11, 12, 13) comprising double wall fuel delivery pipes (11), which in turn comprises an inner flow space (14) for fuel and an outer flow space (16) for possibly leaking fuel,
- a high pressure pump (6) which is in connection with a pressure supply (10), which comprises at least a pressure accumulator unit (9), into which fuel is fed by the high pressure pump, from which pressure accumulator unit (9) the fuel is fed through the double wall fuel delivery pipes (11) to several fuel injectors (8),
- at least one leaking fuel detection arrangement (18', 18") in connection with the outer flow space (16) of at least one section of the pipe system (11, 12, 13),

characterised in that

- the leaking fuel detection arrangements (18', 18") are arranged in connection with the pressure accumulator unit (9) and comprise connecting channels (31) arranged in the pressure accumulator unit, which connecting channels (31) are selectively connectable to the outer flow spaces (16) of the fuel pipe sections connected to the pressure accumulator unit(9)".

Claim 1 of the auxiliary request 1 reads as follows:

"A fuel injection system including an arrangement for locating a fuel leak for a large combustion engine, the fuel injection system comprising:

- a double wall fuel pipe system (11, 12, 13) comprising double wall fuel delivery pipes (11), which in turn comprise an inner flow space (14) for fuel and an outer flow space (16) for possibly leaking fuel,
- a high pressure pump (6) which is in connection with a pressure supply (10), which comprises at least two pressure accumulator units (9), into which fuel is fed by the high pressure pump, from which pressure accumulator unit (9) the fuel is fed through the double wall fuel delivery pipes (11) to several fuel injectors (8),
- at least one leaking fuel detection arrangement (18', 18")

characterised in that

- the leaking fuel detection arrangement (18', 18") is connected with the outer flow space (16) of sections of the pipe system (11, 12, 13),

- the leaking fuel detection arrangements (18', 18") are arranged in connection with the pressure accumulator units (9) and comprise connecting channels (31) arranged in the pressure accumulator units, which connecting channels (31) are selectively connectable to the outer flow spaces (16) of the fuel pipe sections connected to the pressure accumulator unit (9), and that the fuel connection pipe (13) is provided with a partition wall (19) or the like, by means of which the outer flow space (16) is divided into separate compartments, one compartment having a pressure accumulator unit (9) and injectors (8) connected thereto as well as a high pressure pump (6) and another compartment having another pressure accumulator unit (9) and injectors (8) connected thereto as well as high pressure pump (6), and that the outer flow space (16) of both of the compartments is connected with a leaking fuel detection arrangement (18), which comprises means (21, 22, 23, 24) for selectively guiding the flow of leaking fuel forward in a separate discharge flow channel (23) to a leaking fuel alarm device *(17)* or out of the flow space for locating the leak".

VI. The appellant (opponent) essentially argued as follows:

The subject-matter of the claim 1 of the main request is neither new nor inventive in view of document D1.

(a) The person skilled in the art interprets the term "manifold" broader than the opposition division. From document D15 it is concluded that a

"manifold" may include a pipe fitting with several lateral outlets for connecting one pipe with others. A further meaning of "manifold" would be to collect or distribute (a fluid) or to assemble (as sources of supply). Considering the function of a "pressure accumulator unit", namely distributing fuel under high-pressure to several injectors, it is conclusive to state that the "pressure accumulator unit" in the sense of the contested European patent has to be interpreted as a device under which a "manifold" can be subsumed. As the manifold shown in document D1 may also be designed such that more fuel is entering the manifold than fuel being drained to the injection nozzle, it can also serve as a kind of "pressure accumulating unit".

(b) Starting from the fuel injection system known from document D1, the subject-matter of claim 1 is rendered obvious either by the common general knowledge of the skilled person, because it is merely a design choice or by the teaching of document D10 referring to a common rail system.

VII. The respondent patent proprietor) argued essentially as follows:

(a) A "manifold" is a simple distributor, which, unless mentioned otherwise, has the task to distribute the pressure from the pressure pump to different fuel ducts. From document D1, it is not apparent that the manifold has any accumulator characteristics. Moreover, document D1 does not disclose any selectively connectable channels

located in the pump manifold. Therefore, the subject-matter of claim 1 is new.

(b) The claimed subject-matter also involves an inventive step. It is distinguished over D1 by the features of a pressure accumulator unit and that the connecting channels are arranged in the pressure accumulator unit. This reduces the amount of external pipes so that the system is more reliable.

(c) The skilled person had no reason to replace the manifold of D1 by a pressure accumulator. But even if, for some unforeseen reason, the skilled person had thought of replacing the manifold of D1 by a pressure accumulator, he would not have arrived at subject-matter of claim 1 because in that case its leakage indicator would not be integrated into the pressure accumulator, i.e. the connecting channels were not provided in the pressure accumulator. This is consistent with a general trend in mechanics to keep functions apart. The invention acts against this trend and puts these functions together.

(d) With respect to auxiliary request 1, the finding of the board of appeal that the subject-matter of claim 1 of the main request lacked an inventive step was surprising in view of the decision of the opposition division and the annex to the summons to oral proceedings before the board of appeal. Such turn of events could not have been expected. Since claim 1 of auxiliary request 1 is a combination of claim 1 of the main request with

granted dependent claim 8 and since the remaining inconsistencies are minor and could be easily rectified, the first auxiliary request should be admitted into the appeal proceedings.

Reasons for the Decision

1. The appeal is admissible.

2. *Inventive step - main request - claim 1*

2.1 Closest prior art

Document D1 discloses (see in particular figures 4 and 5) a fuel injection system, including an arrangement for locating a fuel leak for a large combustion engine (see, for instance, page 1, lines 47 to 65 in combination with lines 5 to 10). The system comprises a double wall fuel pipe system with double wall fuel delivery pipes 1, 3, having an inner flow space for fuel and an outer flow space 21 for possibly leaking fuel. A high-pressure pump is provided which is in connection with a pressure supply having at least a manifold (page 1, lines 61 to 65) into which fuel is fed by the high-pressure pump and from which fuel is fed through the double wall fuel delivery pipes 1 to several fuel injectors.

At least one leaking fuel detection arrangement 24 is provided in connection with the outer flow space 21 of at least one section of the pipe system (the one shown in figure 4). A plurality of these arrangements is arranged in connection with the manifold (page 1,

lines 63 to 65) and comprises connecting channels 41, 42 which are selectively connectable to the outer flow spaces 21 of the fuel pipe sections connected to the manifold. This selective connection is described on page 2, lines 39 to 53. The movement of a piston 40 blocks or unblocks passage 41 by which the outer flow space 21 is connected or disconnected to the connecting channel 42. This function corresponds to the function of the leaking fuel detection arrangement shown in figures 9 and 10 of the patent in suit.

2.2 Derivation of the technical problem

2.2.1 It is established case law of the boards of appeal that an objective definition of the technical problem to be solved should normally start from the technical problem that is described in the patent in suit. Only if it turns out that an incorrect state of the art was used to define the technical problem or that the technical problem disclosed has in fact not been solved, can an enquiry be made as to which other technical problem objectively existed (see for example T 644/97 of 22 April 1999, point 2.3, not published in the OJ EPO).

The technical problem specified in paragraph 4 of the patent specification is based on US-A-3 783 842 which is different from the one mentioned above (D1) which is considered to represent the closest prior art. With this fuel injection system, the problem specified in the patent, i.e. fast fuel leak detection as well as systematic locating of the leaking location, was already solved.

Hence, it is necessary to reformulate the technical problem based on the fuel injection system known from document D1.

2.2.2 A manifold is a fluid distributor (see for example document D15: "a pipe fitting with several lateral outlets for connecting one pipe with others") and does not necessarily have a pressure accumulating function.

Thus, the subject-matter of claim 1 is distinguished from the fuel injection system of document D1 in that the manifold is a pressure accumulator unit and in that the connecting channels are arranged in the pressure accumulator unit.

In the conventional fuel injection system of D1, the pressure in the fuel delivery pipes controls the opening of the injectors. The injectors open when the pressure exceeds a predetermined value. The use of a pressure accumulator unit, i.e. reservoir, enables that the injectors can be controlled independently from fuel pressure by a control unit.

With the distinguishing feature to arrange the connecting channels in the pressure accumulator unit, the amount of external pipes is reduced.

2.2.3 Thus, starting from D1 as closest prior art the technical problem to be solved may be seen in converting the known fuel injection system into a system in which the injectors can be controlled independently of the fuel pressure and which can be more easily mounted on a combustion engine.

2.3 Obviousness of the solution

2.3.1 It is common ground for the skilled person that the purpose of a common rail system is to decouple fuel pressure generation from fuel injection. The high-pressure pump delivers fuel to a high-pressure reservoir which supplies a plurality of injectors. These are controlled by respective actuators, independent of the pressure in the fuel delivery pipes. For that purpose, the reservoir has to accumulate the pressure so that frequent injections around the upper dead end of the piston are possible and, on the other hand, shock waves created by the actuation of the injectors are dampened. An example of such a system is disclosed in document D10.

2.3.2 In view of the technical problem stated above, the skilled person would apply this common general knowledge on the fuel injection system of document D1 and substitute the manifold by a pressure accumulator unit.

Upon the application of this knowledge the skilled person would consider the integration of the leaking fuel detection arrangement 24 into the pressure accumulator unit for the following reasons:

Typically, manufacturers of common rail systems also manufacture double wall fuel pipe systems with fuel leak detection devices. Hence, despite the asserted trend to keep different functions apart, an incentive exists for the skilled person to integrate the detection devices into the accumulator units because such combined system could be assembled at the factory

and mounted on the combustion engine as a unit. On the other hand, such integration would increase the manufacturing costs. Since no particular advantages were mentioned or could be seen by the board, it does not appear that the selection of either choice required inventive considerations.

These considerations reveal that the skilled person seeking to solve the above objective problem would have arrived at a fuel injection system with all features of claim 1.

2.3.3 Thus, having regard to the prior art, the subject-matter of claim 1 is obvious to a skilled person and, consequently, does not comply with the requirements of Article 56 EPC. Therefore, the main request is not allowable.

3. Admissibility - auxiliary request 1 - claim 1

3.1 Under Article 12(1) of the Rules of Procedure of the Boards of Appeal (RPBA), the scope or frame of discussion in the appeal proceedings is determined by the parties written submissions in the notice of appeal, the statement of grounds, the reply and any answers to the board's communication filed in accordance with the board's instructions. This provision has also to be read in conjunction with paragraph 2 of the same article which stipulates that the statement of grounds and the reply must contain a party's complete case. Thus the parties' written submissions made at the start the appeal proceedings determine and also delimit the scope or frame of discussion of an *inter partes* case.

Article 13(1) RPBA stipulates that "Any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Boards discretion" and further that this discretion "shall be exercised in view of inter alia the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy".

According to Article 13(3) RPBA, "Amendments sought to be made after oral proceedings have been arranged shall not be admitted if they raise issues which the board or the other party or parties cannot reasonably be expected to deal with without adjournment of the oral proceedings.

3.2 Criteria frequently adopted by the boards when exercising their discretion to admit a new request filed in the course of oral proceedings is whether or not good reasons exist for such late filing (which may be the case when amendments are occasioned by developments in the proceedings) and whether or not a new request appears *prima facie* allowable, that is to say clearly overcomes the objections raised (see, e.g., T 270/90, OJ EPO 1993, 725).

3.2.1 In the present case, the request was filed towards the end of the oral proceedings. It pursues an aspect of the invention or embodiment thereof (Fig 1) which was mentioned neither in the respondent's reply to the statement of grounds nor in its answer to the board's communication. Thus consideration of the patentability of this new auxiliary request would clearly extend the scope of debate with respect to that determined by the written appeal proceedings.

3.2.2 Moreover, the issue of inventive step with respect to document D1 has been raised with the opposition and was maintained throughout the opposition and appeal procedures. Thus, the argument of the opponent that finally led to the conclusion of the board set out above, was known to the patent proprietor from the opposition procedure. No surprising new aspects were raised in the appeal procedure which would have confronted the respondent with a fresh case and which could justify such late amendments. Thus, the respondent should have envisaged that the claimed subject-matter of its requests may possibly fail for lack of inventive step and could have filed suitable auxiliary requests as fall back positions well ahead of the oral proceedings before the board.

3.2.3 Claim 1 is a combination of claim 1 of the main request and granted dependent claim 8. This is a substantial amendment of the claimed subject-matter because the embodiment of figure 1 is included therewith.

Claim 1 presents at least the following inconsistencies:

– The terms "pressure accumulator unit" and "pressure accumulator units" are not used consistently in the claims. The same applies for the terms "leaking fuel detection arrangement" and "leaking fuel detection arrangements" and "space" and "spaces".

– The "fuel connection pipe (13)" and the "means (21, 22, 23, 24) for selectively guiding …" mentioned in the characterising portion were not defined in

the claim before they are mentioned with the definite article. Thus it is unclear to which pipe and means they refer.

– In column 11, lines 2 and 4 it is unclear to which high-pressure pump reference is made, in lines 6 and 7 whether the leaking fuel detection arrangement is in addition to the previously mentioned leaking fuel detection arrangement or not.

Hence, the auxiliary request is not *prima facie* allowable, in view of the above inconsistencies and of the fact that amendments in claim 1 raise new issues with regard to Articles 83/100b, 84, and 123(2) EPC. The preparation for a discussion thereof would require adjournment of the oral proceedings.

3.3 The board does not share the respondent's view that it is unfair not to admit the auxiliary request into the proceedings.

As set out above, the appellant maintained its argumentation from the opposition to the appeal procedures. Even in a situation when the decision of the opposition division and a communication of the board is positive for a party, it cannot be excluded that the board comes to a different finding for its decision. Otherwise oral proceedings before the board were pointless and would be reduced to mere formality. For that very reason, communications of the boards indicate its provisional and non-binding character, as also in the present case.

For reasons of fairness to the other parties, a substantial amendment to a party's case could only be admitted when it is filed at a time which allows the other parties and the board to properly prepare for a discussion of the amended case.

Not admitting a request in which claim 1 was substantially amended at the very last moment without justifying reasons and still including several inconsistencies, therefore, cannot be considered unfair to the respondent. Moreover it is noted, that the respondent was allowed to file an amendment to its main request in the oral proceedings before the board.

3.4 For all these reasons the board in exercising its discretion under Article 13(1) RPBA decided not to admit this auxiliary request into the proceedings.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

G. Magouliotis M. Ceyte