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**Datasheet for the decision
of 2 September 2009**

Case Number: W 0020/08 - 3.2.06

Application Number: PCT/EP 2006/003355

Publication Number: WO 2007/115579

IPC: F01K 23/06

Language of the proceedings: EN

Title of invention:

A large turbocharged diesel engine with energy recovery arrangement

Applicant:

MAN DIESEL A/S

Opponent:

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Headword:

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Relevant legal provisions:

PCT R. 40.1, 13.1, 13.2

Relevant legal provisions (EPC 1973):

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Keyword:

"Insufficient reasoning"

Decisions cited:

W 0006/90, W 0004/98, W 0006/98, W 0003/92, W 0011/93,
W 0003/93

Catchword:

-



Case Number: W 0020/08 - 3.2.06

International Application No. PCT/EP 2006/003355

D E C I S I O N
of the Technical Board of Appeal 3.2.06
of 2 September 2009

Applicant: MAN DIESEL A/S
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Representative: Van Walstijn, B., Gerard, G.
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Decision under appeal: Protest according to Rule 40.2(c) of the Patent Cooperation Treaty made by the applicants against the invitation (payment of additional fees) of the European Patent Office (International Searching Authority) dated 6 November 2007.

Composition of the Board:

Chairman: P. Alting Van Geusau
Members: G. Pricolo
S. Hoffmann

Summary of Facts and Submissions

I. The applicant filed International patent application PCT/EP2006/003355 on 12 April 2006. The application contained 46 claims of which the independent claims 1, 9, 23, 30, 31, 44, 45 and 46 are as follows:

"1. A large turbocharged diesel engine comprising: a plurality of cylinders that are each connected to an exhaust gas receiver via respective manifold pipes, an upstream exhaust gas conduit for leading the exhaust gases from the exhaust gas receiver to the inlet of the turbine of the turbocharger, a downstream exhaust gas conduit for leading the exhaust gases from the outlet of the turbine of the turbocharger to the atmosphere, one or more exhaust gas heated boilers or heat exchangers for recovering heat energy from the exhaust gases, characterized in that at least one of said boilers or heat exchangers is disposed within said exhaust gas receiver."

"9. A large turbocharged diesel engine comprising: a turbocharger with an exhaust gas driven turbine that is connected to a charging air compressor, a first exhaust gas heated boiler on the high pressure side of the turbocharger, a power turbine driven by a portion of the exhaust gases that is branched off from the high pressure side of the turbocharger."

"23. A large charged two-stroke diesel engine comprising: an exhaust gas driven turbine driving an electric generator, a charging air compressor driven by an electric drive motor, and a heat exchanger on the

high pressure side of the turbine for extracting heat from the exhaust gas."

"30. A large charged two-stroke diesel engine comprising: an exhaust gas driven turbine driving a hydraulic pump, a charging air compressor driven by an hydraulic drive motor, and a heat exchanger on the high pressure side of the turbine for extracting heat from the exhaust gas."

"31. A charged internal combustion engine for use in a combined heating and power plant, said engine comprising: an intake system for taking in air at ambient pressure and temperature, the intake system including a compressor for delivering charging air with a pressure above ambient to the cylinders of the internal combustion engine, a turbine driven by exhaust gas, and a heat exchanger on the high pressure side of the turbine for extracting heat from the exhaust gas, the heat exchanger and the turbine being configured to obtain an exhaust gas temperature at the low pressure side of the turbine below ambient."

"44. A charged combustion engine comprising an intake system for taking in air at ambient pressure and temperature, the intake system including a compressor for delivering charging air with a pressure above ambient to the cylinders of the internal combustion engine, a first turbine with a given effective turbine area driven by exhaust gas, a second turbine with a given effective turbine area driven by exhaust gas and a heat exchanger on the high pressure side of the turbine for extracting heat from the exhaust gas, and means for selectively using either or both turbines in

order to operate the engine with different exhaust gas temperatures at the low pressure side of the turbine."

"45. A charged combustion engine comprising an intake system for taking in air at ambient pressure and temperature, the intake system including a compressor for delivering charging air with a pressure above ambient to the cylinders of the internal combustion engine, a turbine with a variable effective turbine area driven by exhaust gas and a heat exchanger on the high pressure side of the turbine for extracting heat from the exhaust gas."

"46. A method of operating a charged combustion engine, said charged combustion engine comprising an intake system for taking in air at ambient pressure and temperature, the intake system including a compressor for delivering charging air with a pressure above ambient to the cylinders of the internal combustion engine, a first turbine with a given effective turbine area driven by exhaust gas, a second turbine with a given effective turbine area driven by exhaust gas and a heat exchanger on the high pressure side of the turbine for extracting heat from the exhaust gas, comprising the steps of selectively using turbines to obtain different exhaust gas temperatures at the low pressure side of the turbine or turbines."

- II. On 6 November 2007 the EPO, acting in its capacity as International Searching Authority (ISA), issued an Invitation pursuant to PCT Article 17(3)(a) and Rule 40.1 (on Form PCT/ISA/206) to pay three additional search fees.

The ISA considered that there were four inventions covered by the claims, indicated as follows:

1. Claims 1 to 8, directed to a multi stage heat exchanger system for heat recovery from the exhaust of a turbocharged Diesel engine;
2. claims 9-22, directed to an additional power turbine for recovery of energy from the exhaust of a turbocharged Diesel engine;
3. Claims 23-30, directed to a turbocharger system with hydraulic or electric power transmission between turbine and compressor;
4. Claims 31-46: directed to the operation of a turbocharger as a heat pump.

The reason given by the ISA for the lack of unity was that the only common feature of these four groups of claims, which was the feature: "exhaust energy recovery from a turbocharged Diesel engine", was known from the prior art, as could be seen from the 1st, 2nd, 3rd, 4th, 5th, 6th, and 7th document cited in the search report. The features of the first invention (claims 1-8) could therefore be regarded as solving the problem of "extracting heat from the exhaust of a turbocharged Diesel engine with optimum heat transfer efficiency". In contrast to this, the features of the second invention (claims 9-22) could be regarded as solving the problem of "making power from exhaust gas expansion turbines of a Diesel engine available at different torque and speed levels". In further contrast to this, the features of the third invention (claims 23-30) could be regarded as solving the problem of "how to add flexibility to the utilization of mechanical power from an exhaust gas expansion turbine of a Diesel engine for

driving the charging compressor of said Diesel engine and further driving additional auxiliary components". In even further contrast to this, the features of the fourth invention (claims 31-46) could be regarded as solving the problem of "how to add flexibility to the adjustment of mechanical and thermal power generation of a turbocharged Diesel engine with heat recovery from the exhaust". Therefore, in the ISA's view, four inventions were defined which were neither linked by a single inventive concept (Rule 13.1 PCT) nor by any special technical feature (Rule 13.2 PCT).

III. With letter dated 16 November 2007 the applicant paid under protest the three additional search fees and submitted that the Invitation to pay additional fees was not sufficiently reasoned and thus did not comply with Rule 40.1(i) PCT. The applicant essentially submitted that the ISA did not determine the special technical features of each claimed invention in accordance with Rule 13.2 PCT by comparing it with the closest prior art. Moreover, the invitation indicated for each of the inventions a problem to be solved, with the problem to be solved being derived from arbitrarily determined special technical features.

IV. With a communication dated 28 April 2008 on Form PCT/ISA/228, a review panel confirmed the ISA's opinion regarding lack of unity and invited the applicant to pay a protest fee for the examination of the protest. The review panel came to this finding by identifying the special technical features of each invention over the closest prior art represented by document

D2 : EP-A-0 434 419,

cited in the international search report, and the problem solved by the special technical features. According to the opinion of the review panel, a first invention was defined in claims 1 to 8, a second invention in claims 9 to 22 and 44, 46, a third invention in claims 23 to 30 and a fourth invention in claims 31 to 46.

- V. With letter dated 30 April 2008, the applicant filed a response to the review panel's reasoning together with a debit order for the payment of the protest fee.

The applicant essentially restated that the ISA's invitation to pay additional fees was not a logically presented technical reasoning based on the identification of the special technical features of the invention claimed and further submitted that this defect could not be remedied by the additional reasoning provided by the review panel. Accordingly, the applicant's request to refund the additional search fees was justified. The applicant moreover submitted that the finding of lack of unity by the review panel was incorrect because based on an incorrect analysis of the prior art.

Reasons for the Decision

1. The protest is admissible.
2. In its Invitation to pay additional fees (hereinafter referred to as the "Invitation"), the ISA defined four inventions or groups of inventions, in substance by

specifying that the only common feature of the four groups of claims was the feature: "exhaust energy recovery from a turbocharged Diesel engine", this feature being however known from the prior art, and by specifying the problems solved by the features of the first to fourth inventions (see above point II of this decision).

3. According to established case law of the Boards of Appeal (see W 6/90, OJ EPO 1991, 438, point 3.2 of the reasons; W 4/98; W 6/98), a single general inventive concept may be said to be absent only if no partial identity exists among the teachings in an application, taking account of the technical features of the subject matter claimed and the effects achieved. In particular, an investigation of unity of invention must be based on an analysis of the technical problem or problems underlying the respective groups of invention in the light of the relevant prior art.

Such a full analysis of special technical features, associated effects and problems which would be necessary to exclude any technical relationship required by Rule 13.2 PCT may only be foregone in straight forward cases without offending against the obligations under Rule 40.1 PCT (see W 3/92).

In the present case, neither a full analysis of special technical features has been carried out, nor can it be said that the application represents a straight forward case.

4. The ISA's finding that the only feature in common between different independent claims is known from the

prior art cannot possibly justify a finding of lack of unity, since it does not take into consideration the effects achieved by the other features of the claims.

In other words, having regard to text of Rule 13.2 PCT and to the definition of "special technical features" as those technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art, the fact that the only feature in common among the claims is known from the prior art does not exclude the presence of a technical relationship among the inventions, involving one or more corresponding special technical features (Rule 13.1 PCT), because a technical relationship could be found in terms of the effects of the special technical features. This situation might for example arise when claims having in common known feature(s) only (e.g. one or more features defined in the preamble of the claims) include special technical features (e.g. the features defined in the characterizing portion of the claim) that define alternative solutions to a same technical problem.

5. Although the ISA provided a list of the technical problems solved, it failed to explain how it arrived at formulating those problems. In particular, as pointed out by the applicant, it is not clear on the basis of what features of the claims the problems are derived. Nor is it clear whether the technical problems are formulated without taking into account the prior art cited in the search report (if this were the case, then it is not clear why the statements of the problems substantially differ from the general statements in the introductory part of the description of the application

on pages 2 to 9), or are rather based on a comparison with the cited prior art (if this were the case, then it is not clear what specific prior art has been taken into consideration, as the Invitation generally refers to seven documents).

6. Therefore, in the Board's judgement, it cannot objectively be inferred from the Invitation for what reasons the ISA concluded that the application lacked unity. Accordingly, the Invitation is not sufficiently reasoned and thus does not comply with Rule 40.1(i) PCT.

7. In the invitation to pay the protest fee (see point IV of this decision) the review panel carried out a detailed analysis of the features of the claims vis-à-vis D2, identified the special technical features, derived the technical problems solved for each group of inventions and examined whether the different technical problems were linked to each other. By doing this, however, the review panel added new reasons to those contained in the Invitation to pay additional fees. In accordance with constant practice of the Boards of Appeal the Board cannot take account of new reasons and evidence added by the ISA review body in the invitation to pay the protest fee (see e.g. W 11/93), nor can it investigate of its own motion whether an objection relating to non-unity of invention might be justified for other reasons not considered in the ISA's invitation to pay additional fees (see e.g. W 3/93, OJ EPO 1994, 931). Accordingly, the new reasons are disregarded by the Board.

Order

For these reasons it is decided that:

Refund of the three additional search fees and the protest fee is ordered.

The Registrar:

The Chairman:

C. Eickhoff

P. Alting van Geusau