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**Datasheet for the decision  
of 21 May 2007**

**Case Number:** T 0356/05 - 3.5.02

**Application Number:** 99111531.2

**Publication Number:** 0967439

**IPC:** F23N 1/02

**Language of the proceedings:** EN

**Title of invention:**

Internal combustion engine having combustion heater

**Applicant:**

Toyota Jidosha Kabushiki Kaisha

**Opponent:**

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**Headword:**

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**Relevant legal provisions:**

EPC Art. 83, 84

**Keyword:**

"Sufficiency of disclosure - after amendment (yes)"

**Decisions cited:**

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**Catchword:**

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Case Number: T 0356/05 - 3.5.02

**D E C I S I O N**  
of the Technical Board of Appeal 3.5.02  
of 21 May 2007

**Appellant:** Toyota Jidosha Kabushiki Kaisha  
1, Toyota-cho,  
Toyota-shi, Aichi-ken, 471-8571 (JP)

**Representative:** TBK-Patent  
Bavariaring 4-6  
D-80336 München (DE)

**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 5 November 2004  
refusing European application No. 99111531.2  
pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** M. Rognoni  
**Members:** J.-M. Cannard  
C. Holtz

## Summary of Facts and Submissions

- I. The appellant contests the decision of the examining division to refuse European patent application No. 99 111 531.2. The reasons given for the refusal were that claim 1 of the main request did not fulfil the requirements of Article 123(2) EPC and the application with the claims of the first and second auxiliary requests did not fulfil the requirements of Article 83 EPC.
- II. In a communication dated 22 November 2006, the Board pointed out, *inter alia*, that claim 1 according to the request filed with the statement of grounds of appeal (claim 1 as originally filed) did not appear to meet the requirements of Article 84 EPC because the expression "latent flame" had no well-recognized meaning in the relevant art, and that the application as a whole contravened Article 83 EPC because the disclosure of the invention did not enable the skilled person to carry out the invention over the whole of the broad field claimed.
- III. Claim 1 of the current request filed with the letter faxed on 18 April 2007 reads as follows (added matter underlined):
- "An internal combustion engine having a combustion heater (17) operating and raising temperatures of engine related elements when said internal combustion engine is in a predetermined operating state, said engine comprising:
- igniting means (17h, 17g, 17i) for making a latent flame (F') by initiating a self-sustaining combustion by

igniting a combustion fuel of said combustion heater (17), which self sustaining combustion is able to grow surely into flames (F) once the air flow and the fuel supply are increased;

a combustion chamber (17d) for growing the latent flame (F') formed by said igniting means (17h, 17g, 17i) into flames (F);

an air supply passageway (33) for supplying said combustion chamber (17d) with the air for combustion;

a combustion gas discharge passageway (35) for discharging a combustion gas out of said combustion chamber (17d); and

an air quantity control means (45) for controlling a quantity of the air flowing within said combustion chamber (17d) in accordance with a differential pressure occurred between the side of said air supply passageway (33) and the side of said combustion gas discharge passageway (35) in said combustion chamber (17d).

Claims 2 to 23 are dependent on claim 1.

IV. The written arguments of the appellant can be summarised as follows:

In the combustion heater of the invention, while the air supply to an evaporator chamber was reduced, supplied fuel was heated to an ignitable condition by a glow plug. Then the air supply was increased so that the required heating for the fuel air mixture was achieved and the

ignition took place in the combustion chamber. The temperature of the glow plug could not rise up to the self ignition temperature if a too high quantity of air flew into the combustion chamber, or an already formed small flame, called "a latent flame" because it would not surely grow, could be extinguished by an excessive air flow. The skilled person having basic engineering skills and studying the application documents would be able to carry out the invention.

- V. According to the file, the appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of:

claim 1 filed with the letter of 18 April 2007 and claims 2 to 23 filed with the letter of 22 March 2007;

description, pages 1 to 4, 7 to 117 as originally filed, pages 5 and 6 filed with the letter of 22 March 2007, and page 5a filed with the letter of 18 April 2007;

drawings, figures 1/19 to 19/19 as originally filed.

### **Reasons for the Decision**

1. The appeal is admissible.

#### *Meaning of the expression "latent flame"*

2. Claim 1 of the application as originally filed comprises the expression "latent flame" which was objected to as not clear in the decision under appeal (page 2). The meaning of this expression is not explicitly defined in

the application as filed. Nor is the Board aware of a well-recognized meaning for this expression in the relevant art. However, according to the application as filed, vaporized fuel is ignited for obtaining a "latent flame" F' as a source of flames and a "latent flame" is produced when the ignition is completed (published application, paragraphs [0114], lines 39 to 41 and [152], lines 45 to 48). The process for igniting a combustion fuel described in said application (see column 28, line 6 to column 30, line 14; figures 3 to 6) comprises the steps of opening a valve (44) in a communicating passage way (36), heating a mixture of air and vaporized fuel (S103 to S107) with a glow plug (17g), reducing the quantity of air and fuel (S108, S109) supplied in the combustion chamber (17d), and deciding, using a temperature sensor (17h), whether the ignition is completed (S111), in other words, whether a "latent flame" able to grow surely into flames is produced. Then (steps S112 to S114), the valve (44) is closed and the quantity of vaporized fuel and the quantity of air flowing in the combustion chamber are increased. Moreover, according to paragraph [0023], the quantity of air flowing to the combustion chamber is "sufficiently reduced or further down to 0 (zero)" to avoid that the air flow is strong enough to prevent the ignition or to extinguish an unstable flame. On basis of the description as filed, the Board judges therefore that the words "making a latent flame" in the application mean initiating a self-sustaining combustion which is able to grow surely into flames once the air flow and the fuel supply are increased.

*Amendments*

3. The Board is satisfied that the claims and description according to the present request meet the requirements of Article 84 EPC and do not contravene Article 123(2) EPC.

3.1 This applies more specifically to the present claim 1 which is based on claim 1 as filed with the added limitation to a latent flame produced "by initiating a self-sustaining combustion by igniting a combustion fuel of said combustion heater (17), which self sustaining combustion is able to grow surely into flames (F) once the air flow and the fuel supply are increased". As explained in the previous paragraph (see above 2.), the limitation added to claim 1 clarifies the meaning of the expression "a latent flame" on the basis of the description as originally filed.

3.2 The description has been adapted to the amended claims and to mention the prior art document DE-C-41 09 436.

*Sufficiency of disclosure*

4. The Board judges that the description and the drawings of the application as filed (see for instance paragraph 2. above) describe a way of "initiating a self-sustaining combustion by igniting a combustion fuel of said combustion heater (17), which self sustaining combustion is able to grow surely into flames (F) once the air flow and the fuel supply are increased", that is to say a way of making "a latent flame". There is no doubt that the person skilled in the art would be able to ignite the mixture of vaporized fuel and air present

in the combustion chamber 17d of the heater using the glow plug 17g and to detect the completion of the ignition of this mixture using the temperature sensor 17h, following the instructions given in the description in the light of the common general knowledge in the field. In particular, it is sufficient that the temperature produced by the combustion reaction has reached such a level that the combustion does not run the risk of being extinguished by a subsequent increase of the air flow, and the latent flame has a magnitude which allows it to grow into flames. Thus, at least one way enabling the person skilled in the art to carry out the invention over the whole of the field claimed is disclosed in the application in suit. The Board judges that the application as a whole does not contravene Article 83 EPC.

5. According to the decision under appeal, the only grounds for the refusal were that amended claim 1 according to the main request then on file contravened Article 123(2) EPC and the application with the claims according to the first and second auxiliary requests then on file did not fulfil the requirements of Article 83 EPC. The application as presently amended meets the requirements of Articles 83 and 123(2) EPC and claim 1 now is clear enough for an examination to be made in the respects of the other requirements of the EPC. However, the Board notes that no examination of claim 1 has been made by the examining division having regard to the requirements of the EPC other than those of Articles 84 and 123(2) EPC and the arguments of the proprietor in support of novelty and inventive step of the subject-matter of present claim 1, which have been given in the course of the appeal proceedings, have not yet been considered by



the examining division. In such circumstances, the Board finds it appropriate to remit the case to the department of first instance for further prosecution.

## Order

### **For these reasons it is decided that :**

1. The decision under appeal is set aside.
2. The decision is remitted to the department of first instance for further prosecution on the basis of:

claim 1 filed with the letter of 18 April 2007 and claims 2 to 23 filed with the letter of 22 March 2007;

description, pages 1 to 4, 7 to 117 as originally filed, pages 5 and 6 filed with the letter of 22 March 2007, and page 5a filed with the letter of 18 April 2007;

drawings, figures 1/19 to 19/19 as originally filed.

The registrar:

The Chairman:

U. Bultmann

M. Rognoni