

**Internal distribution code:**

- (A) [ - ] Publication in OJ
- (B) [ - ] To Chairmen and Members
- (C) [ - ] To Chairmen
- (D) [ X ] No distribution

**Datasheet for the decision  
of 13 June 2019**

**Case Number:** T 0847/16 - 3.2.03

**Application Number:** 10197445.9

**Publication Number:** 2341287

**IPC:** F23R3/00, F23R3/60

**Language of the proceedings:** EN

**Title of invention:**

Method for maintenance of a combustion chamber of a gas turbine plant

**Patent Proprietor:**

Ansaldo Energia S.p.A.

**Opponent:**

Siemens Aktiengesellschaft

**Headword:**

**Relevant legal provisions:**

EPC Art. 123(2), 54, 56

**Keyword:**

Amendments - added subject-matter (no)

Novelty - (yes)

Inventive step - (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0  
Fax +49 (0)89 2399-4465

Case Number: T 0847/16 - 3.2.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.03**  
**of 13 June 2019**

**Appellant:** Siemens Aktiengesellschaft  
(Opponent) Werner-von-Siemens-Straße 1  
80333 München (DE)

**Representative:** Kaiser, Axel  
CT IP S DE  
Corporate Intellectual Property  
Otto-Hahn-Ring 6  
80200 München (DE)

**Respondent:** Ansaldo Energia S.p.A.  
(Patent Proprietor) Via Nicola Lorenzi 8  
Genova (IT)

**Representative:** Bergadano, Mirko  
Studio Torta S.p.A.  
Via Viotti, 9  
10121 Torino (IT)

**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 21 March 2016  
rejecting the opposition filed against European  
patent No. 2341287 pursuant to Article 101(2)  
EPC.**

**Composition of the Board:**

**Chairman** G. Ashley  
**Members:** C. Donnelly  
E. Kossonakou

## **Summary of Facts and Submissions**

I. The appeal lies from the decision of the opposition division rejecting the opposition against European Patent No. EP 2 341 287.

The opponent (hereinafter: the "appellant") appealed against this decision. In reply to the grounds of appeal, the patent proprietor (hereinafter the "respondent") submitted auxiliary requests 1 to 4.

II. In a communication dated 26 October 2018, pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA), the Board informed the parties of its provisional opinion.

III. By letter of 26 October 2018, the appellant presented further arguments and submitted document "Anlage B1".

IV. Oral proceedings were held on 13 June 2019. At the end of the debate the following requests were confirmed:

The appellant requested that the decision under appeal be set aside and the patent revoked.

The respondent requested that the appeal be dismissed, alternatively, that the patent be maintained in amended form on the basis of one of the auxiliary requests 1 to 4 filed with the reply to the grounds of appeal.

V. The appellant referred to the following documents:

E3: EP 1 741 981 A1;

E10: EP 2 236 928 A1.

Anlage B1: Print-out from the on-line dictionary "LEO" concerning the definition of the word "frame"

VI. The following feature analysis of claim 1 as granted will be referred to in this decision:

**a)** Method for the maintenance of a combustion chamber (1) of a gas turbine plant;

**b)** the combustion chamber (1) comprising a casing (2) and a plurality of first tiles (4) of refractory material fixed to the casing (2) by coupling elements (9), which engage respective lateral faces (6) of the first tiles (4); the method being characterised by comprising the steps of:

**c)** removing coupling elements (9) of one first tile (4);

**d)** fixing to the casing (2) one assembling frame (21) provided with a central connection element (31);

**e)** centrally fixing a second tile (4a) to the central connection element (31) of the assembling frame (21);

**f)** the step of fixing to the casing one assembly frame (21) comprising the step of making on an area (11) of the casing (2), which is beneath the first tile (4), at least one coupling hole (13) for fixing the assembling frame (21) to the casing (2);

**g)** wherein the assembling frame (21) being provided with at least one through hole (26);

**h)** the step of fixing to the casing (2) an assembling frame (21) comprising the step of screwing at least one

connecting screw (27) to the through hole (26) and to the coupling hole (13) of the casing (2) and

**i)** the step of making on the casing (2) a plurality of cooling holes (15) for the flowing of a cooling fluid.

VII. The submissions of the parties relevant to the decision can be summarised as follows:

*(a) Appellant*

*(i) Article 100(c) EPC, Extended subject-matter*

Amendments were made during the examination procedure to features c), d) and f) based on parts of the description relating to the specific embodiments shown in the figures.

However, the description of the specific embodiments is not limited to features c), d) and f), but also includes the construction of the casing, the form of the tiles, the construction of the assembling frame and its attachment to the casing and the necessary preparations for this to be carried out.

It is evident that there is a clear functional and structural link between the casing, the tiles and the assembling frame. The same is also true for the disclosure concerning the steps involved in changing out the tiles. Otherwise it would not be technically possible in the specific embodiment disclosed to exchange the coupling elements of feature c) with an assembling frame according to feature d) which is to be fitted in an area according to feature f). All of the features disclosed in the description of the specific

embodiment are therefore vital for the arrangement to work.

In particular, the step of removing the coupling elements is inextricably linked to the step of eliminating crystallised material on an area of the internal face beneath the tile.

The passage from page 5, line 26 to page 6, line 2, reading "When an overheating damage occurs to casing 2, upon the detachment of one of the tiles 4, combustion chamber 1 is repaired in accordance with .....", indicates that the maintenance method is intended for the very specific case of when damage has occurred due to a tile becoming detached. Consequently, the method is only implemented once a tile or several tiles has/have become detached in order to eliminate crystallised material. Therefore, there is an intermediate generalisation since this step is not comprised in the amended claim.

In conclusion, the amendments introduced after filing do not meet the requirements of Article 123(2) EPC.

*(ii) Novelty*

The subject-matter of claim 1 lacks novelty with respect to E10. In particular, the opposition division was incorrect in deciding that E10 does not disclose features e) and i). Regarding feature e), figure 3 of E10 clearly shows that the tile 10 is placed centrally on the central fixing element 2 and 3 by means of the frame 5. A direct connection between the fixing element and the tile is not required by claim 1.

As regards feature i), paragraph [0043] of E10 states that in a preferred embodiment, the casing 16 comprises cooling holes 23 which are connected with cooling air channels.

The cooling holes disclosed in E10 could be made in the casing at any time, including during maintenance work, particularly if it were discovered that the damage had been caused by a lack of cooling.

*(iii) Inventive step*

The subject-matter of claim 1 lacks an inventive step starting out from E3 in combination with the skilled person's general knowledge.

The opposition division decided that E3 does not disclose features c), d) and i). In particular, the opposition division considered that the plate-spring packet 54 was not a mounting frame. However, this is incorrect since as defined in Anlage B1, the term "frame" has a very broad meaning and encompasses such as the arrangement of E3 in which the plate-spring packet 54 is fixed to the tile 3 by means of the bolt 17 so as to support the tile. Therefore, the plate-spring packet acts as a support frame.

*(a) Respondent*

*(i) Article 100(c) EPC, Extended subject-matter*

The decision of the opposition division is correct. There is no reason why the amendments made to features c), d) and f) cannot be analysed separately.



The relationship between the first tile, the second tile, the frame and the casing was explicitly disclosed in claim 1 as filed and the amendments do not alter this.

In particular, the step of removing the coupling elements is not inextricably linked to the step of eliminating crystallised material on an area of the internal face beneath the tile, which is in any case an optional step (see page 9, final line to page 10 line 4).

As regards feature d), in the entire description as filed, including those parts not related to the specific embodiment, the step of fixing an assembling frame to the casing refers clearly to one single frame and never to more than one frame. Therefore, after the amendment the skilled person is not presented with information which is not directly and unambiguously derivable from the description as filed. Moreover, a frame was already disclosed in claim 1 as filed and was not introduced by the amendment. The fact that there is just one frame is not a feature extracted in isolation from the description and no intermediate generalisation has been introduced.

It is also directly and unambiguously derivable that the coupling holes are drilled on an area of the casing which is beneath the detached tile (see the originally filed description page 6, lines 10 to 15). The definition of the area 11 is given on page 6, lines 7 to 8 and page 9, line 26 to page 10 line 1 and in figures 3 and 4.

*(ii) Articles 100(a), 54 EPC, Novelty*

E10 does not disclose any maintenance steps. Therefore, the subject-matter of claim 1 as granted is new at least for this reason. Furthermore, E10 does not teach changing the way the tiles are coupled to the casing during the maintenance operation.

Also the bolt 2 shown in figure 1 of E10 is only used to fix centrally the frame to the casing and not to connect the tile centrally to the frame.

*(iii) Articles 100(a), 56 EPC, Inventive step*

E3 discloses two separate embodiments:

(i) the heat shield elements are fixed to the casing by retaining clips which engage peripheral areas of the heat shield element;

(ii) the heat shield elements are fixed directly to the casing by a ceramic screw. The heat shield elements are centrally fixed to the casing.

The first embodiment fails to disclose features a), c), d), e), f), g), h) and i)

The second embodiment discloses none of the features of claim 1.

E3 teaches that the same coupling system should be used when any tiles are replaced.

The cup spring assembly 54 disclosed in paragraph [0038] of E3 is not an assembling frame.

The coupling disclosed in paragraphs [0037-0038] of E3 cannot be used on a casing which is damaged by

excessive heating since the required hole size to accommodate the central connecting element would be too large.

## **Reasons for the Decision**

1. *Article 100(c) EPC, Extended subject-matter*

1.1 Claim 1 as granted is based on claims 1,2,4 and 5 as filed.

1.2 In comparison with the claims as filed features c), d) and f) were amended during the examination proceedings as shown below in underlined italics:

**c)** removing coupling elements (9) *of one first tile (4)*;

**d)** fixing to the casing (2) *one* assembling frame (21) provided with a central connection element (31);

**f)** the step of fixing to the casing *one* assembly frame (21) comprising the step of making on *an area (11) of the casing (2), which is beneath the first tile (4)*, at least one coupling hole (13) for fixing the assembling frame (21) to the casing (2);

1.3 As regards features c) and d), claim 1 as originally filed already specified "removing coupling elements (9)" and "fixing to the casing (2) an assembling frame". As pointed out by the respondent, in the entire description as filed, the step of fixing an assembling frame to the casing refers clearly to one single frame and never to more than one frame for replacing one tile (e. g. see page 1, lines 5 to 10 "The present invention relates to a method for the maintenance of a combustion

chamber of a gas turbine plant for the production of energy and to **an** assembling frame for **a** tile of a combustion chamber" and page 3, lines 19 to 21 "It is a further object of the invention to provide **an** assembling frame for **a** tile of a combustion chamber..." (emphasis added by the board). Thus, the amendments merely emphasise what the skilled person would have directly and unambiguously understood when reading the application.

- 1.4 As regards feature f), originally filed dependent claim 4 specifies that "the step of fixing to the casing (2) an assembling frame (21) comprises the step of making on the casing (2) at least one coupling hole (13) for fixing the assembling frame (2) to the casing."
- 1.5 According to this specification the coupling hole can be made anywhere on the casing. However, it is evident that the coupling hole would be made on an area (11) of the casing (2), which is beneath the first tile (4) from which the coupling elements have been removed, since this is the only area of the casing which will be accessible once the first tile has been detached.
- 1.6 Therefore, the amendment to feature f) is justified based on the disclosure of original claim 4 and technical common sense. Since the amendment is not based on the narrower disclosure of the description at page 6, lines 14 to 16, in which the coupling hole (13) is made along each groove (12), there is no intermediate generalisation.
- 1.7 The appellant also submitted that claim 1 constituted an intermediate generalisation since the step of removing the coupling elements is inextricably linked

to the step of eliminating crystallised material on an area of the internal face beneath the tile.

- 1.8        However, the board agrees with the respondent that as indicated in the passage at page 9, final line to page 10, line 4 of the description as filed, overheating damage to the casing is not always serious and removal of such damage is therefore an optional step.
  
- 1.9        This is also borne out by the passage of the originally filed application at page 2, lines 2 to 7, which states that the casing portions beneath the detached tiles "may be subject to damage", i.e. they are not necessarily subject to damage.
  
- 1.10       This is also confirmed by the passage referring to the specific embodiment at page 6, lines 4 to 8 which states "The method for the maintenance of combustion chamber 1 substantially includes removing the coupling elements 9 of the detached tile and eliminating **any** fused and crystallized material.....".
  
- 1.11       Elimination of fused and crystallized material was also not specified in claims 1,2,4 and 5 as filed upon which claim 1 as granted is based.
  
- 1.12       Thus, the elimination of fused and crystallised material is an optional step in addition to removing the damaged coupling elements since it only needs take place if such material is present.
  
- 1.13       In conclusion, claim 1 as granted is essentially a combination of claims 1,2,4 and 5 as filed with minor amendments which the skilled person would unambiguously and directly derive from the application as a whole.

1.14 Thus, the requirements of Article 123(2) EPC are met.

2. *Articles 100(a), 54 EPC, Novelty*

2.1 The board agrees with the respondent that the subject-matter of claim 1 as granted is new, at least because E10 does not disclose a method of maintenance, but rather a method of construction of a combustion chamber of a gas turbine plant (see in particular claim 16 of E10). Since a maintenance method is fundamentally different to a construction method in that it entails the replacement of parts already assembled during the construction method, a comparison between the disclosure of E10 and the subject-matter of claim 1 using the wording of the claim is difficult.

2.2 Notwithstanding this, the board considers E10 in the wording of the claim to disclose:

a method for the construction of a combustion chamber of a gas turbine plant; the combustion chamber comprising a casing (16) and a plurality of first tiles (10) of refractory material fixed to the casing by coupling elements (7), which engage respective lateral faces (8) of the first tiles (10);

the method further comprising the steps of:

- fixing to the casing (15) one assembling frame ("Trägerplatte" 5) provided with a central connection element ("Befestigungsschraube" 2);

- centrally fixing a first tile (10) to the central connection element (2) of the assembling frame (5);

- the step of fixing to the casing (15) one assembly frame (5) comprising the step of making on an area of

the casing, which is beneath the first tile (10), at least one coupling hole (22) for fixing the assembling frame (5) to the casing (15);

- wherein the assembling frame (5) is provided with at least one through hole (11,12);

- the step of fixing to the casing (15) an assembling frame (5) comprising the step of screwing at least one connecting screw (2) to the through hole (11,12) and to the coupling hole (22) of the casing (15) and

- the step of making on the casing (15) a plurality of cooling holes (23) for the flowing of a cooling fluid (see paragraph [0043] and figure 4).

2.3 Therefore, as pointed out by the respondent, in addition to not being a maintenance method, E10 does not teach changing the way the tiles are coupled to the casing during the maintenance operation or in the words of the claim, the steps of:

- removing coupling elements of one first tile;

- centrally fixing a second tile to the central connection element of an assembling frame,

Thus, the subject-matter of claim 1 as granted is new.

3. *Articles 100(a), 56 EPC, Inventive step*

*E3 in combination with the skilled person's general knowledge*

3.1 It is apparent from paragraph [0041] of E3 that it is specifically intended that the ceramic tiles can be easily removed and replaced, which the skilled person would realise could be used in a maintenance method.

3.2 However, this maintenance method requires that the same coupling means, which are used to hold the original (first) tile, are also used to retain the replacement tile; according to the disputed invention, different coupling means are used. Also, the spring-plate assembly 54 shown in figure 2 of E3 cannot be described as an "assembling frame" in the sense of claim 1, since it is neither a "frame" in the conventional sense nor is it used as a frame to position the tile on the casing. The primary function of the spring-plate assembly is to take up changes in the tile dimensions caused by thermal expansion once the tile has been positioned by means of the mounting section provided centrally in the tile.

3.3 In conclusion the board considers E3 to disclose:

a method for the maintenance of a combustion chamber (1) of a gas turbine plant;

the combustion chamber comprising a casing and a plurality of first tiles (1) of refractory material fixed to the casing by a coupling element (17), the method comprising the steps of:

removing a coupling element ("Keramikschraube 17") of one first tile (1);

centrally fixing a second tile to the central connection element (13) of the second tile;

using on an area of the casing, which is beneath the first tile (1), the existing coupling hole (52) for fixing the replacement tile to the casing;



the step of fixing the replacement tile to the casing comprising the step of screwing at least one connecting screw (17) to the through hole (11) and to the coupling hole (52) of the casing.

3.4 The subject-matter of claim 1 differs from the method disclosed in E3 in that:

the first tiles of refractory material are fixed to the casing by coupling elements, which engage respective lateral faces of the first tiles; and

- fixing to the casing one assembling frame provided with a central connection element;

- the step of fixing to the casing one assembly frame comprising the step of making on an area of the casing, which is beneath the first tile, at least one coupling hole for fixing the assembling frame to the casing; and wherein the assembling frame is provided with at least one through hole; and

the step of fixing to the casing an assembly frame comprising the step of screwing at least one connecting screw to the through hole and to the coupling hole of the casing; and

the step of making on the casing a plurality of cooling holes for the flowing of a cooling fluid.

3.5 Given these fundamental differences, starting out from the method disclosed in E3, the skilled person would not arrive at the subject-matter of claim 1 as granted without exercising inventive activity since there are no hints or suggestions in E3 itself to incite the skilled person to carry out such modifications, nor would they be obvious on the basis of general knowledge alone.

3.6 Thus, the subject-matter of claim 1 as granted involves an inventive step and meets the requirements of Article 56 EPC.

## Order

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

The appeal is dismissed.

The Registrar:

The Chairman:



C. Spira

G. Ashley

Decision electronically authenticated