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**Datasheet for the decision
of 31 May 2022**

Case Number: T 1561/18 - 3.2.06

Application Number: 06254318.6

Publication Number: 1760265

IPC: F01D5/18, B23P15/04, C22C47/16,
C23C4/00, C23C4/12

Language of the proceedings: EN

Title of invention:

Blade with a cooling microcircuit and corresponding
manufacturing method

Patent Proprietor:

Raytheon Technologies Corporation

Opponent:

Safran Aircraft Engines

Headword:

Relevant legal provisions:

EPC Art. 123(2)
RPBA 2020 Art. 13(1)

Keyword:

Amendment to appeal case - amendment overcomes issues raised
(no)

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Catchword:



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Case Number: T 1561/18 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 31 May 2022

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
9 April 2018 concerning maintenance of the
European Patent No. 1760265 in amended form.**

Composition of the Board:

Chairman M. Harrison
Members: M. Hannam
W. Ungler

Summary of Facts and Submissions

- I. An appeal was filed by the appellant (opponent) against the interlocutory decision of the opposition division in which it found that European patent No. 1 760 265 in an amended form met the requirements of the EPC. The appellant requested that the decision under appeal be set aside and the patent be revoked.
- II. The respondent (patent proprietor) requested that the appeal be dismissed or, in the alternative, that the patent be maintained in amended form according to one of auxiliary requests 1 to 15.
- III. The Board issued a summons to oral proceedings and a subsequent communication containing its provisional opinion, in which it indicated that the subject matter of the independent method and device claims of each of the main request and auxiliary requests 1 to 15 seemed not to meet the requirement of Article 123(2) EPC.
- IV. With letter of 31 March 2022 the respondent filed claims for a new main request and for new auxiliary requests 1 to 11, the previous requests on file being withdrawn.
- V. Oral proceedings were held before the Board by videoconference on 31 May 2022. At the close of the proceedings the requests of the parties were as follows:
The appellant requested that the decision under appeal be set aside and the patent be revoked.
The respondent requested that the patent be maintained in amended form on the basis of the main request or of

one of the auxiliary requests 1 to 11 all filed with letter dated 31 March 2022.

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

"A method for manufacturing a turbine engine component (50) comprising the steps of:
forming a first half (12) of an airfoil portion (10) of the turbine engine component; and
forming a plurality of cooling microcircuits (120) having at least one passageway on an exposed internal wall surface [20) of said first half (12) of said airfoil portion (10); characterised by further comprising placing a respective cover plate (128) over each said cooling microcircuit (120) and joining said respective cover plate to internal features (122) of said cooling microcircuit (120) defining said at least one passageway of said cooling microcircuit using a brazing technique or a solid state diffusion bonding technique;
wherein said cooling microcircuits forming step comprises forming each said first cooling microcircuit (120) with an inlet (124) and an outlet (126); said internal features (122) being pedestal structures arranged between said inlet (124) and said outlet (126) and around which cooling fluid passes as it flows from said inlet (124) to said outlet (126), the pedestals being circular in cross section."

Claim 1 of auxiliary request 1 reads as for claim 1 of the main request.

Claim 1 of auxiliary request 2 reads as for claim 1 of the main request with the following features appended:

"further comprising:

forming a second half (14) of said airfoil portion (10) of said turbine engine component;
placing said first half (12) of said airfoil portion (10) in an abutting relationship with respect to said second half (14) of said airfoil portion (10) and joining said first half (12) to said second half (14)".

Claim 1 of auxiliary request 3 reads as for claim 1 of auxiliary request 2 with the following features appended:

"wherein said cooling microcircuits forming step comprises forming each said cooling microcircuit (120) by casting a plurality of elements forming said at least one passageway".

Claim 1 of auxiliary request 4 reads as for claim 1 of the main request with the following features appended:

"further comprising:
forming a second half (14) of said airfoil portion (10) of said turbine engine component;
forming at least one additional cooling microcircuit (120') having at least one passageway on an exposed internal wall surface (22) of said second half (14) of said airfoil portion (10);
placing a respective cover plate (128') over each said additional cooling microcircuit (120') and joining each said respective cover plate (128') to each said additional cooling microcircuit (120') using a brazing technique or a solid state bonding technique; and
placing said first half (12) of said airfoil portion (10) in an abutting relationship with respect to said second half (14) of said airfoil portion (10), joining said first half (12) to said second half (14), and inspecting each of said microcircuits (120,120') prior

to said placement of said first half (12) in said abutting relationship with said second half [14)".

Claim 1 of auxiliary request 5 reads as for claim 1 of auxiliary request 4 with the following features appended:

"wherein said cooling microcircuits forming step comprises forming each said cooling microcircuit (120) by casting a plurality of elements forming said at least one passageway".

Claim 1 of auxiliary request 6 reads as for claim 1 of auxiliary request 4 with the following feature appended:

"and prior to placement of the respective cover plates (128, 128') thereover".

Claim 1 of auxiliary request 7 reads as for claim 1 of auxiliary request 6 with the following features appended:

"wherein said cooling microcircuits forming step comprises forming each said cooling microcircuit (120) by casting a plurality of elements forming said at least one passageway".

Claim 1 of auxiliary request 8 reads as for claim 1 of the main request with the following features appended:

"forming at least one additional cooling microcircuit [120') having at least one passageway on an exposed internal wall surface (22) of said second half (14) of said airfoil portion (10);
placing a respective cover plate (128') over each said

additional cooling microcircuit (120') and joining each said respective cover plate (128') to each said additional cooling microcircuit (120') using a brazing technique or a solid state bonding technique; and placing said first half (12) of said airfoil portion (10) in an abutting relationship with respect to said second half (14) of said airfoil portion (10), joining said first half (12) to said second half (14) using a transient liquid phase bonding technique, and inspecting each of said microcircuits (120,120') prior to said placement of said first half (12) in said abutting relationship with said second half (14)".

Claim 1 of auxiliary request 9 reads as for claim 1 of auxiliary request 8 with the following features appended:

"wherein said cooling microcircuits forming step comprises forming each said cooling microcircuit (120) by casting a plurality of elements forming said at least one passageway".

Claim 1 of auxiliary request 10 reads as for claim 1 of auxiliary request 9 with the following feature appended:

"and prior to placement of the respective cover plates (128, 128') thereover".

Claim 1 of auxiliary request 11 reads as for claim 1 of auxiliary request 10 with the following features appended:

"wherein said cooling microcircuits forming step comprises forming each said cooling microcircuit (120) by casting a plurality of elements forming said at

least one passageway".

VII. The appellant's arguments may be summarised as follows:

The main request should not be admitted under Article 13(1) RPBA 2020. The feature "the pedestals being circular in cross section" was not directly and unambiguously disclosed in Fig. 2 such that the subject-matter of claim 1 *prima facie* failed to meet the requirement of Article 123(2) EPC.

VIII. The respondent's arguments may be summarised as follows:

The requests filed with letter of 31 March 2022 should be admitted. When reading paragraphs [0014] and [0016] of the patent application, the skilled person would wish to refer to Fig. 2 in order to understand what was meant by pedestal structures in the context of the patent application and thus the form of the disclosed pedestal structures. Fig. 2 was a very schematic drawing. The sole information that was relevant and could be extracted from Fig. 2, at least in the context of the patent application, was that the pedestals were of circular cross-section. The skilled person would also understand claim 1 as defining a single, constant circular cross section, a frustoconical pedestal not being considered by the skilled person. The inclusion of the pedestals being circular in cross section thus had basis in the application as filed and the subject-matter of claim 1 *prima facie* met the requirement of Article 123(2) EPC.

The subject-matter of claim 1 of each of the auxiliary requests 1 to 11 met the requirement of Article 123(2) EPC for the same reasons as those given for the main

request, at least in regard to the pedestals. The auxiliary requests should thus be admitted.

Reasons for the Decision

1. *Main request*

1.1 *Admittance - Article 13(1) RPBA 2020*

1.1.1 In its preliminary opinion, the Board considered the subject-matter of claim 1 of the (then) main request to extend beyond the content of the application as filed, contrary to the requirement of Article 123(2) EPC. In an attempt to overcome this objection, the respondent filed a new main request with letter of 31 March 2022. This was an amendment to the respondent's appeal case, since the request resulted in removal of further features of the pedestal structures already in the claim, not merely of alternatives, thus resulting in a different combination of features and thus different subject-matter. Its admittance was consequently at the discretion of the Board under Article 13(1) RPBA 2020. Such discretion may be exercised *inter alia* in view of any amendment *prima facie* overcoming the objections to the pending requests.

1.1.2 Claim 1 of the present main request is based on claims 1, 5 and 6 as filed in combination with the feature "said internal features (122) being pedestal structures arranged between said inlet (124) and said outlet (126) and around which cooling fluid passes as it flows from said inlet (124) to said outlet (126)", derived from paragraph [0014] of the application as filed and the feature "the pedestals being circular in cross section", taken

from Fig. 2 when read in conjunction with paragraph [0014].

1.1.3 The feature "the pedestals being circular in cross section" lacks a *verbatim* basis in the application as filed and is not directly and unambiguously derivable in such generality from Fig. 2. This figure is very schematic and allows little concrete information to be extracted regarding the microcircuits depicted therein. The respondent alleges the sole information that is to be extracted from Fig. 2 by a skilled person, at least in the context of the patent application at paragraph [0014], is that the pedestals are of circular cross-section. The Board however sees this feature as a generalisation of how the pedestals are depicted in Fig. 2. In particular, these are not depicted as simply having a somewhat circular cross section but also as having a generally cylindrical form, this also being how the appellant described the nature of the pedestals in item 4.2 of its grounds of appeal. Indeed, the definition of the pedestals selected by the respondent includes within its scope pedestals with constantly varying circular cross sections along their length, such as pedestals having a frustoconical form. Such pedestals are, however, not disclosed in the application as filed, this therefore underlining that a definition of the pedestals merely having a circular cross section lacks a direct and unambiguous basis in the application as filed.

1.1.4 The respondent's reference to paragraph [0014] of the patent in support of its interpretation of Fig. 2 fails to justify extraction of the feature "the pedestals being circular in cross section" from Fig. 2. Paragraph [0014] is silent as to the shape or cross section of the pedestal structures, it simply being indicated that

internal features 122, such as pedestal structures, define one or more passageways for a cooling fluid. From this paragraph, therefore, there is no basis to conclude that the pedestals depicted in Fig. 2 unambiguously have a circular cross section.

- 1.1.5 Likewise, the respondent also argued that the skilled person would read paragraph [0014] in conjunction with paragraph [0016] and, in the context of the application, then conclude that the pedestals only needed to provide the connection between the cover plate and the internal wall surface to thereby define passageways, such that reference to Fig. 2 was only needed to determine what was meant by pedestal structures in the context of the application. However, this does not alter the Board's finding that, when considering Fig. 2, the skilled person had no basis upon which to extract solely the feature of the pedestals having a circular cross section, even when considering the form of the pedestals alone and even accepting that a circular cross section could be derived at all, let alone when considering the other features disclosed in combination therewith.
- 1.1.6 The respondent's argument that the skilled person would understand claim 1 as defining a single, constant circular cross section rather than a frustoconical pedestal is not accepted. The definition in claim 1 of the pedestals being circular in cross section does not linguistically suggest this being a single, constant circular cross section. In addition, a pedestal with a plurality of different circular cross sections or one with a continuously varying cross section e.g. frustoconical is also not unreasonable from a technical point of view.

1.1.7 The inclusion of the feature "the pedestals being circular in cross section" therefore *prima facie* lacks a direct and unambiguous disclosure in the application as filed. Consequently the subject-matter of claim 1 *prima facie* fails to meet the requirement of Article 123(2) EPC.

1.1.8 The main request is therefore not admitted into the proceedings (Article 13(1) RPBA 2020).

2. *Auxiliary requests 1 to 11*

2.1 Claim 1 of each of these requests includes the feature "the pedestals being circular in cross section" found, as explained above, to be subject-matter of claim 1 of the main request which extends beyond the content of the application as filed. No feature included in the respective claim 1 of any of the auxiliary requests changes the Board's finding with respect to Article 123(2) EPC not being met for the main request. The respondent also confirmed this to be the case.

2.2 The subject-matter of claim 1 of each of auxiliary requests 1 to 11 thus *prima facie* fails to meet the requirement of Article 123(2) EPC.

2.3 Auxiliary requests 1 to 11 are therefore also not admitted into the proceedings (Article 13(1) RPBA 2020).

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:



D. Grundner

M. Harrison

Decision electronically authenticated