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**Datasheet for the decision
of 19 October 2023**

Case Number: T 0018/20 - 3.2.06

Application Number: 13777576.3

Publication Number: 2809578

IPC: F01D5/30, B64C27/46, B64C27/48,
B64C11/16

Language of the proceedings: EN

Title of invention:

FAN BLADE ATTACHMENT OF GAS TURBINE ENGINE

Patent Proprietor:

RTX Corporation

Opponent:

Safran Aircraft Engines

Headword:

Relevant legal provisions:

EPC Art. 123(3)

Keyword:

Amendments - main request and auxiliary requests 1 to 9 -
broadening of claim (yes)

Decisions cited:

Catchword:



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Case Number: T 0018/20 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 19 October 2023

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
7 October 2019 concerning maintenance of the
European Patent No. 2809578 in amended form.**

Composition of the Board:

Chairman M. Harrison
Members: P. Cipriano
D. Prietzel-Funk

Summary of Facts and Submissions

- I. The appellant (opponent) filed an appeal against the interlocutory decision of the opposition division in which the opposition division found that European patent No. 2 809 578 in an amended form according to auxiliary request 1 met the requirements of the EPC.
- II. The appellant (opponent) requested that the decision under appeal be set aside and the patent be revoked.
- III. With its reply, the respondent (patent proprietor) requested that the appeal be dismissed or, as an auxiliary measure, that the patent be maintained according to one of auxiliary requests 1 to 4.
- IV. The Board issued a summons to oral proceedings and a subsequent communication containing its provisional opinion, in which it indicated *inter alia* that claim 1 of the main request (auxiliary request 1 as found allowable by the opposition division) contravened Article 123(3) EPC and that the amendments made to claim 1 of auxiliary requests 1 to 4 did not overcome the objection under Article 123(3) EPC to the main request.
- V. With letter dated 4 October 2023 and after notification of the summons to oral proceedings before the Board, the respondent filed further auxiliary requests 5 to 9.
- VI. Oral proceedings were held before the Board on 19 October 2023 on the EPO premises.

At the close of the oral proceedings, the requests of the parties were as follows:

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

The respondent requested that the appeal be dismissed, or that the patent be maintained in amended form based on one of auxiliary requests 1 to 4 submitted with the letter dated 3 June 2020 or on one of auxiliary requests 5 to 9 filed with the letter dated 4 October 2023.

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

"1. A fan blade (68) comprising:

a root (74;100) including a front surface (84;108), a rear surface (86), a first side surface (88;114) connected to the front surface (84;108) and the rear surface (86), and a second side surface (90;116) connected to the front surface (84;108) and the rear surface (86); and

a blade extending from the root (74;100); characterised in that

the front surface (84;108) engages the first side surface (88;114) and the second side surface (90;116) by curved blunted surfaces, and the rear surface (86) engages the first side surface (88;114) and the second side surface (90;116) by curved blunted surfaces, wherein the root (74; 100) has an upper portion (80; 104) including substantially parallel walls (82; 106), and the upper portion (80; 104) includes only one of the blunted surfaces between the front surface (84;108) and the first side surface (88;114), only one of the blunted surfaces between the front surface (84;108) and the second side surface (90;116), only one of the blunted surfaces between the rear surface (86) and the

first side surface (88;114), and only one of the blunted surfaces between the rear surface (86) and the second side surface (90;116); and in that

the substantially parallel walls (82;106) define a width (W12; W0) therebetween, wherein a distance (X1, X2; X0) is defined between an outer edge (96;120) of the upper portion (80; 104) of the root (74;100) and a line (98; 122) that extends substantially parallel to the outer edge (96;120), wherein the line (98; 122) passes through the point where the front surface (84;108) and a first blunted surface meet and the point where the rear surface (86) and a second blunted surface meet, and wherein a ratio of the distance (X1, X2; X0) to the width (W12; W0) is between about 0.15 to about 0.50."

VIII. The wording of claim 1 of auxiliary request 1 reads as claim 1 of the main request with the following features appended:

"wherein a cross-section of the root (74;100) taken substantially parallel to a bottom surface of the root (92;118) includes no angles and each of the blunted surfaces has a radius."

IX. The wording of claim 1 of auxiliary request 2 reads as claim 1 of auxiliary request 1 with the last feature of the claim relating to the radii of the blunted surfaces being amended to:

"each of the blunted surfaces has a radius between about 0.254 cm to about 1.524 cm (about 0.1 inch to about 0.6 inch)."

X. The wording of claim 1 of auxiliary request 3 reads as claim 1 of auxiliary request 2 with the last feature of

the claim relating to the radii of the blunted surfaces being amended to:

"each of the blunted surfaces has a radius between about 0.9525 cm to about 1.524 cm (about 0.375 inch to about 0.6 inch)."

XI. The wording of claim 1 of auxiliary request 4 reads as claim 1 of auxiliary request 3 with the feature of the claim relating to ratio of the distance to the width of the parallel walls being amended to:

"wherein a ratio of the distance (X1, X2; X0) to the width (W12; W0) is about 0.50".

XII. The wording of claim 1 of auxiliary requests 5 to 9 corresponds to the wording of claim 1 of the main request and auxiliary requests 1 to 4, respectively, but with the following features inserted at the beginning of the claim:

"A turbine engine (20) comprising:
a compressor section (24);
a combustor (56) in fluid communication with the compressor section (24);
a turbine section (28) in fluid communication with the combustor (56); and
a fan (42) including a fan rotor (62) and a plurality of fan blades (68),
wherein the fan rotor (62) includes a plurality of slots (64), and the root (74;100) of each of the plurality of fan blades (68) is received in one of the plurality of slots (64) of the fan rotor (62), each [fan blade comprising...]"

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

Main request - Article 123(3) EPC

The protection conferred by the granted patent was extended by the amendments to claim 1 of the main request.

Claim 1 of the main request defined that "only one" of the blunted surfaces at the surface intersections was in the upper portion of the root and thus the remaining blunted surfaces were necessarily in portions of the root other than the upper portion, whereas claim 1 as granted defined that "all" the blunted surfaces were necessarily included in the upper portion.

Auxiliary requests 1 to 9 - Article 123(3) EPC

None of the amendments made to claim 1 of the auxiliary requests 1 to 9 overcame the objection under Article 123(3) EPC to the main request since they all contained the same wording in that respect.

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

Main request - Article 123(3) EPC

The protection conferred by the granted patent was not extended by the amendments to claim 1 of the main request.

The expression "engages... by one or more of the blunted surfaces" in granted claim 1 did not exclude the existence of further blunted surfaces located on a

portion other than the upper portion of the root. This possibility had thus always been allowed by granted claim 1 such that the protection conferred by the patent was not extended by the amendment made to the main request, which simply made it an explicit requirement that blunted surfaces were present in a portion other than the upper portion.

Reasons for the Decision

1. Main request - Article 123(3) EPC

1.1 Claim 1 of the main request has been amended with respect to claim 1 as granted (the deletions are struck through and the additions are underlined) such that the first features of the characterising portion now read:

- the front surface (84;108) engages the first side surface (88;114) and the second side surface (90;116) by ~~one or more~~ curved blunted surfaces, and the rear surface (86) engages the first side surface (88;114) and the second side surface (90;116) by ~~one or more~~ curved blunted surfaces,

- wherein the root (74; 100) has an upper portion (80; 104) including substantially parallel walls (82; 106), and the upper portion (80; 104) includes ~~the one or more~~ only one of the blunted surfaces between the front surface (84;108) and the first side surface (88;114), only one of the blunted surfaces between the front surface (84;108) and the second side surface (90;116), only one of the blunted surfaces between the rear surface (86) and the first side surface (88;114), and

only one of the blunted surfaces between the rear surface (86) and the second side surface (90;116).

- 1.2 According to Article 123(3) EPC, a European patent may not be amended in such a way as to extend the protection it confers. This requirement must therefore be met by claim 1 of the main request with respect to claim 1 as granted.
- 1.3 Part of the wording of granted claim 1 concerning the engagement of surfaces, i.e. "the front surface engages the first side surface and the second side surface by one or more blunted surfaces" and "the rear surface...", when taken alone, allows the inclusion of one or more blunted surfaces at any edges of the blade root at any location thereon (e.g. the upper portion or the base portion).
- 1.4 The respondent argued that the interpretation was skewed by the order of the features in the wording of granted claim 1. It contended that if the upper portion would have been defined before the blunted surfaces such that the blunted surfaces would have been defined as being included in the upper portion, it would be clearer that granted claim 1 did not exclude further blunted surfaces outside the upper portion of the root.

The Board does not dispute that an alternative order of features might give rise to the interpretation suggested by the respondent, but finds that the order of the features in granted claim 1 results in a different interpretation of the claim. How the claim is drafted is of importance and the Board can only consider the claim as granted, not how it might have been drafted.

- 1.4.1 With the wording of claim 1 as granted, it would not be technically logical to arrive at an interpretation whereby the expression "the front surface (84;108) engages the first side surface (88;114) and the second side surface (90;116) by one or more blunted surfaces" allows further blunted surfaces in addition to those defined in the claim.

The expression "[engages...] by one or more blunted surfaces" defines the means for establishing the engagement between the front and side surfaces of the root as a whole and does not set an upper limit on the number of blunted surfaces required for this engagement. Since no upper limit is set, the skilled person would not logically consider that even further blunted surfaces (besides the ones defined in claim 1) should define the engagement. The expression "one or more" is exhaustive with respect to the number of possible blunted surfaces that establish the engagement. Only other means, such as other (non-blunted) types of surfaces, would not be excluded by the claim. The same applies to the analogous expression regarding the rear surface defined in claim 1. Put another way, the expression "one or more blunted surfaces" defines, exclusively, all possible blunted surfaces at the engagement of the surfaces.

- 1.5 The respondent further argued that the expression "one or more [blunted surfaces]", in the last lines of the granted claim, should be interpreted as "a [blunted surface] or more [blunted surfaces]" such that the skilled person understood that further blunted surfaces were not excluded by the wording of granted claim 1.

This argument is not convincing. The expression in the features relating to the upper portion in the claim is

"*the* one or more blunted surfaces" and not simply "one or more" blunted surfaces and therefore refers to the same blunted surfaces previously defined in the claim. Thus, when considering the option of "more blunted surfaces" from the available "one or more blunted surfaces", granted claim 1 defines that the upper portion includes the (i.e. "*the* ... more") blunted surfaces. Since the word "*the*" is used, this can only logically mean "all" of these surfaces in the context of the option of the plurality of surfaces.

1.6 The wording of claim 1 of the main request no longer encompasses the possibility of having only one blunted surface at each of the edges (i.e. the engagement of the surfaces at the corners), yet requires that the upper portion "includes only one of the blunted surfaces" in each of the edges. Thus, contrary to granted claim 1, any remaining blunted surfaces need no longer be included in the upper portion.

1.7 The respondent argued that these amendments narrowed the scope of claim 1 to only one blunted surface in each of the edges of the upper portion, a possibility already defined in granted claim 1. In addition, the respondent argued that the requirement that any remaining blunted surfaces not be included in the upper portion was already allowed by the wording of granted claim 1. The protection conferred by claim 1 of the main request was therefore allegedly narrowed in comparison to claim 1 as granted.

The Board does not accept these arguments. As already dealt with in items 1.4 and 1.5 above, claim 1 as granted does not cover the possibility of having other blunted surfaces establishing the engagement between the surfaces of the root than those already defined in

granted claim 1. Granted claim 1 therefore does not allow blunted surfaces between the surfaces of the root outside the upper portion (due to the wording "the upper portion includes *the* one or more blunted surfaces") whereas claim 1 of the main request does.

1.8 The protection conferred by the patent has thus been extended by the amendments to claim 1 in the main request. Article 123(3) EPC is therefore contravened with the consequence that the main request is not allowable.

2. Auxiliary requests 1 to 9 - Article 123(3) EPC

2.1 Since claim 1 of auxiliary requests 1 to 4 respectively included the same feature, the Board stated in item 4.2 of its preliminary opinion that the amendments made to claim 1 of auxiliary requests 1 to 4 did not seem to overcome the objection under Article 123(3) EPC raised for claim 1 of the main request.

2.2 The respondent did not provide any specific arguments regarding these auxiliary requests such that the Board has no reason to alter its provisional opinion and confirms same herewith.

2.3 Claim 1 of auxiliary requests 5 to 9 filed with letter dated 4 October 2023 defines a turbine engine comprising:

- a compressor section;
- a combustor in fluid communication with the compressor section;
- a turbine section in fluid communication with the combustor; and

- a fan including a fan rotor and a plurality of fan blades, wherein the fan rotor includes a plurality of slots, and the root of each of the plurality of fan blades (68) is received in one of the plurality of slots (64) of the fan rotor (62),
- each fan blade being defined in accordance with the fan blade of claim 1 of, respectively, the main request and auxiliary request 1 to 4.

2.4 None of these amendments is directed to the position of the blunted surfaces of the root of each fan blade, which has not changed in relation to claim 1 of the main request and has already been discussed above under point 1.

The respondent also did not put forward any arguments in this respect such that the Board has no reason to reach a different conclusion on these requests either.

2.5 Thus, claim 1 of each of auxiliary requests 1-9 does not meet the requirement of Article 123(3) EPC. Auxiliary requests 1 to 9 are therefore not allowable.

3. Absent any set of claims complying with the requirements of the EPC, the appeal is allowable and the patent has to be revoked (Article 101(3)(b) EPC).

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