

Internal distribution code:

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

**Datasheet for the decision
of 5 September 2023**

Case Number: T 1731/19 - 3.2.06

Application Number: 13735101.1

Publication Number: 2877704

IPC: F01D5/18, F01D5/22, F01D9/04

Language of the proceedings: EN

Title of invention:
Turbine airfoil apparatus and corresponding manufacturing method

Patent Proprietor:
General Electric Company

Opponent:
Raytheon Technologies Corporation

Headword:

Relevant legal provisions:
EPC Art. 54, 123(2)
RPBA Art. 12(2), 12(4)
RPBA 2020 Art. 12(3), 23

Keyword:

Novelty - main request (no)

Reply to statement of grounds of appeal - reasons set out clearly and concisely (auxiliary requests 1-3 - no)

Amendments - extension beyond the content of the application as filed (auxiliary request 4 - yes)

Decisions cited:

Catchword:

There is no right of the parties to choose in which form the Board of Appeal should exercise its competences under Article 111(1) EPC. The Board is entitled to decide on the issue of admittance of auxiliary requests without being bound to the respondent's request for prioritisation of the request for remittal. (Reasons, points 8.2 to 8.4)



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 1731/19 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 5 September 2023

Appellant: Raytheon Technologies Corporation
(Opponent) Pratt & Whitney
400 Main Street
East Hartford, CT 06118 (US)

Representative: Dehns
St. Bride's House
10 Salisbury Square
London EC4Y 8JD (GB)

Respondent: General Electric Company
(Patent Proprietor) 1 River Road
Schenectady, NY 12345 (US)

Representative: Hoffmann Eitle
Patent- und Rechtsanwälte PartmbB
Arabellastraße 30
81925 München (DE)

Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 1 April 2019
rejecting the opposition filed against European
patent No. 2877704 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairman M. Hannam
Members: T. Rosenblatt
W. Ungler

Summary of Facts and Submissions

I. The appellant (opponent) filed an appeal against the decision of the opposition division rejecting the opposition against European patent 2 877 704.

II. With its statement of grounds of appeal, the appellant maintained *inter alia* its novelty objection against claims 1 and 9 of the patent based on D1: US 2011/0223004 A1.

The appellant also raised objections in regard to auxiliary requests 1 to 3 which had been submitted before the opposition division (but which were not part of the impugned decision).

III. With the reply to the statement of grounds of appeal, filed with the letter dated 16 December 2019, the respondent (patent proprietor) submitted auxiliary requests 1 to 4. Auxiliary requests 1 to 3 were said to correspond to auxiliary requests 1 to 3 submitted before the opposition division.

IV. With the letter dated 6 March 2020, the appellant noted *inter alia* that the respondent had not replied to the outstanding objections against auxiliary requests 1 to 3.

V. The parties were summoned to oral proceedings before the Board.

In a communication pursuant to Article 15(1) of the Rules of Procedure (RPBA 2020), the Board informed the parties of its preliminary opinion on the case. The Board opined *inter alia* that the subject-matter of

claim 1 appeared to lack novelty in regard to D1. The Board further stated its intention to not take auxiliary requests 1 to 3 into account (Article 12(4) RPBA 2007) for lack of substantiation of these requests. It furthermore indicated that the amendments introduced in claims 1 and 9 of auxiliary request 4 did not appear to meet the requirements of Article 84 and 123(2) EPC.

- VI. The oral proceedings were held on 5 September 2023.
- VII. The appellant requested that the decision under appeal be set aside and the patent be revoked.

The respondent requested that the appeal be dismissed (main request), in the alternative that the patent be maintained in amended form according to one of auxiliary requests 1 to 4 submitted with the letter of 16 December 2019. Furthermore, it requested that the case be remitted to the opposition division if the Board were not in a position to admit and decide substantively on the auxiliary requests 1 to 3.

- VIII. Independent claim 1 of the patent (**main request**) has the following wording:

"A turbine airfoil apparatus (10, 110) comprising:
an airfoil (18, 118) including a concave pressure sidewall (20, 120) and a convex suction sidewall (22, 122) joined together at a leading edge (24, 124) and at a trailing edge (26, 126); an endwall (16, 116) that projects laterally outwardly from the airfoil (18, 118) at one spanwise end thereof, the endwall (16,116) having an outer surface (42,142) facing the airfoil 18, 118) and an opposing inner surface (40, 140);
a plenum (44, 144) defined within the endwall (16, 116)

between the inner (40, 140) and outer surfaces (42, 142) wherein the plenum (44, 144) is forked in plan view, with at least two branches; and at least one film cooling hole (48, 148) passing through the outer surface (42, 142) and communicating with the plenum (44, 144), characterized in each branch having a throat (2, 4, 102, 104) disposed at its upstream end."

Independent claim 9 of the patent has the following wording:

"A method of making a cooling hole pattern in a turbine airfoil apparatus (10, 110) that includes: an airfoil (18, 118) including a concave pressure sidewall (20, 120) and a convex suction sidewall (22, 122) joined together at a leading edge (24, 124) and at a trailing edge (26, 126); an endwall (16, 116) that projects laterally outwardly from the airfoil (18, 118) at one spanwise end thereof, the endwall (16, 116) having an outer surface (42, 142) facing the airfoil (18, 118) and an opposing inner surface (40, 140); and a plenum (44,144) defined within the endwall (16, 116) between the inner (40, 140) and outer surfaces (42, 142) wherein the plenum (44, 144) is forked in plan view, with at least two branches, the method comprising machining through the outer surface (42, 142) so as to define at least one film cooling hole (48, 148) communicating with the plenum (44, 144), characterised in each branch having a throat (2,4,102,104) disposed at its upstream end."

Claims 1 and 9 of **auxiliary request 1** comprise the following additional features appended at the

respective claim ends:

"wherein the throat has a relatively constricted flow area for increasing flow velocity of cooling air".

Claims 1 and 9 of **auxiliary request 2** comprise in addition to the feature added in auxiliary request 1 the further feature appended at the respective claim ends:

"wherein one of the at least two branches further comprises a plurality of spaced-apart turbulators (46) downstream of the throat".

In **auxiliary request 3** the apparatus claims 1 to 8 have been deleted and the sole independent method claim 1 reads as follows (underlining of the amendments added by the Board):

"A method of making a cooling hole pattern in a turbine airfoil apparatus (10, 110) that includes:

casting a blade (10) as a one-piece casting, the blade comprising:

an airfoil (18, 118) including a concave pressure sidewall (20, 120) and a convex suction sidewall (22, 122) joined together at a leading edge (24, 124) and at a trailing edge (26, 126);

an endwall (16, 116) that projects laterally outwardly from the airfoil (18, 118) at one spanwise end thereof, the endwall (16, 116) having an outer surface (42, 142) facing the airfoil (18, 118) and an opposing inner surface (40, 140); and a plenum (44, 144) defined within the endwall (16, 116) between the inner (40, 140) and outer surfaces (42, 142) wherein the plenum (44, 144) is forked in

plan view, with at least two branches, each branch having a throat (2, 4, 102, 104) disposed at its upstream end, wherein the throat has a relatively constricted flow area for increasing flow velocity of cooling air, wherein the plenum includes a first branch (2, 3, 102, 103) extending in a generally axial direction, and a second branch (4, 5, 104, 105) disposed axially forward of the first branch (2, 3, 102, 103);

wherein the first branch comprises a plurality of spaced-apart turbulators (46) downstream of the throat;

wherein a purge hole (50, 150) passes through the inner surface (40, 140) to exhaust to a secondary flowpath inboard of the endwall, the purge hole (50, 150) communicating with the second branch (4, 5, 104, 105) of the plenum (44, 144);

the method further comprising a revision to the cast blade, the revision comprising plugging the purge hole (50, 150) and machining through the outer surface (42, 142) so as to define at least one film cooling hole (48, 148) communicating with the second branch (4) of the plenum (44, 144)."

Compared to granted claims 1 and 9, in **auxiliary request 4** the following feature has been added to the end of the respective independent claims 1 and 9:

"and in a region (3, 103) of a first of the at least two branches downstream of the throat (2, 102) including a plurality of spaced-apart turbulators (46)".

IX. The arguments of the appellant may be summarised as follows.

Main request

Claim 1 lacked novelty over D1. Although the opposition division had correctly recognised that the ridges disclosed in D1 provided a throat, i.e. a point of minimum cross-sectional area in a flow duct, it was incorrect to conclude that the ridges did not extend along the whole length of the cooling channels, as disclosed in paragraph 33 of D1. The ridge at the upstream most end corresponded then to the claimed throat at the upstream end. The respondent adopted a far too limited interpretation of the expressions "throat" and the "upstream end" in the light of the description. The functions attributed to the term "throat" and its distinction from a turbulator were not defined in the claim.

Auxiliary requests 1 to 3

The references to a "relatively constricted flow area" and the effect on otherwise undefined "cooling air" introduced in the amended claims of the auxiliary requests introduced problems under Article 84 EPC as the scope of the respective independent claims was not clear (especially to the extent these features were intended to distinguish over the ridges in D1 which also provided a constricted flow area that would act to change the velocity of cooling air in a similar fashion). Moreover, auxiliary request 3 was not supported by the original text and it was not clear what inventive significance this was intended to have.

With its reply to the grounds of appeal, the respondent failed to explain how auxiliary requests 1 to 3 might overcome the objections raised in the appeal grounds.

As to the respondent's request for remittal, this would require a set of claims which was admitted into the proceedings as a basis for further prosecution.

Auxiliary request 4

The amendments made in auxiliary request 4 were said to be based on paragraph 21 of the application as filed. This paragraph and paragraph 24 together with Figure 2 related to a specific embodiment which comprised certain other features which were not defined in claim 1. The features described in these paragraphs acted together to provide the described cooling effects and there was no apparent justification for introducing these features in isolation of their original context. By doing this, the proprietor had introduced subject-matter extending beyond the strict content of the original application.

- X. The arguments of the respondent may be summarised as follows.

Main request

Claim 1 was novel over D1, since this did not disclose a throat. Contrary to the opinion of the appellant and the opposition division, D1 also failed to disclose a throat-like feature (e.g. the "ridges", shown in Figure 5) situated at an upstream end of the respective branch. The purpose of the ridges in D1 was to introduce turbulence in the cooling fluid flow. A skilled person would however understand a throat or nozzle, as defined in claim 1, to be different in terms of its structure and function from such a turbulator disclosed in D1. Throats and turbulators were commonly known in the field of fluid mechanics. In contrast to

turbulators which acted on the fluid flow boundary layer, a throat or nozzle reduced the cross-section of a flow passage over a certain length so as to cause an acceleration of the bulk fluid through the throat, without introducing turbulence by acting on the boundary layer. A throat could thus not simply be equated to a point of minimal cross-sectional area of a flow passage. The patent moreover clearly distinguished between these two elements and their respective function, see for example the end of paragraph 16 and paragraph 17.

Auxiliary requests 1 to 3

The auxiliary requests 1 to 3 had been filed during the opposition procedure and thus were part of the proceedings so that the Board could not exclude these from the appeal proceedings. The requests had been substantiated upon filing before the opposition division and no further substantiation was then required when filing the same requests on appeal. Moreover, the purpose of the amendments to the claims of auxiliary request 1 to 3 was self-evident in view of the preceding discussions on novelty and inventive step. Since the objection raised by the appellant under Article 84 EPC against the amendments in auxiliary requests 1 and 2 was not substantiated and constituted merely an incomprehensible allegation, the respondent was not obliged to respond to this. Similarly, the objection to auxiliary request 3 did not require any further reply since the basis for the amendments had been indicated already when filing the corresponding request in the opposition procedure. Under these circumstances a response to these unsubstantiated objections would only have unnecessarily increased the burden of costs incurred by the respondent.

The Rules of Procedure of the Boards of Appeal only set out guiding principles for the conduct of an efficient procedure, they were however not mandatory to be followed. This was particularly relevant in the present case, where the consideration of the auxiliary requests 1 to 3 did not further complicate the matter to be discussed, as their subject-matter had been known by the other party at least since their filing in the opposition procedure. The Rules of Procedure should thus not be applied too strictly in these circumstances since this would only go to the detriment of the respondent. Since these requests were in the opposition procedure, the Board should rather remit the case to the opposition division.

Auxiliary request 4

The amendments to the claims were based on paragraph 21 of the application as filed. The granted claim also related to the embodiment disclosed in this paragraph. The application as filed viewed as a whole taught that the features taken from this embodiment could be generalised; many of the features included in paragraph 21 were to be found in the dependent claims as filed. It could thus be concluded that these features were just optional for this embodiment and did not need to be included in the claims when adding the feature relating to the turbulators. The turbulators had a specific effect which was independent from all other features of the embodiment.

Reasons for the Decision

Main request

1. Contrary to the conclusion reached by the opposition division in its impugned decision, the Board finds that the subject-matter of granted claim 1 lacks novelty (Article 54(1) and (2) EPC) in view of D1.
2. As acknowledged by the opposition division the features of the preamble of granted claim 1 are known from D1, which was also not disputed by the respondent. The only question which requires a decision by the Board in regard to the requirement of novelty is thus whether the turbine airfoil apparatus of D1 comprised also the feature defined in the characterising portion of claim 1, i.e. "each branch having a throat disposed at its upstream end". The Board considers this to be the case.
3. The Board agrees with the interpretation suggested by the appellant of the feature "throat" as defining a reduced cross-sectional area or constriction in a flow duct. This interpretation is corroborated by the description of the patent, where it is stated in column 3, lines 53 to 55, that "the second region has a relatively constricted flow area, seen as a reduced width or lateral dimension [...] This functions as a throat or nozzle to increase flow velocity [...]".

The Board cannot see that this interpretation would be technically unreasonable. It is rather well known in the field of fluid dynamics (following from Bernouilli's principle) that a constriction in a fluid flow path provides for an increase in flow velocity, which is in line with the passage of the description

referred to in the previous paragraph. This applies irrespective of the specific shape and scale of the constricting feature. Apart from unsubstantiated allegations, the appellant has submitted no evidence contradicting this understanding. Whether boundary layer effects lead to a turbulent or laminar flow at or after the constriction (or throat) is irrelevant in that respect since such effects depend on many other parameters (fluid flow characterising parameters, such as Reynold number, pressure, density, and scale), nothing of which is defined in the apparatus claim.

The Board does not agree with the respondent's central argument that a throat would be understood by the skilled person as implying certain further structural and functional limitations in regard to its scale, shape and effect on the (bulk) fluid flow through it. The respondent has not submitted any evidence for its allegation that the term throat indeed had such a well defined limited meaning in the field of fluid mechanics or thermodynamics. The respondent's arguments rely rather on an interpretation of the term throat in the light of the description of the patent, specifically on the fact that in one embodiment of the turbine airfoil apparatus of the patent a certain region of a branch may (optionally) be provided with turbulators (ribs, fins, pins or the like, see column 4, lines 6 to 10), additionally to the throat. The Board acknowledges that such turbulators are shown in Figure 3 of the patent together with a throat. This indeed provides an indication that different structural and functional features may have been intended to be implied by the terms "throat" and "turbulator". However, the claim defines neither turbulators, nor the specific configuration (shape and scale) and effects potentially sought for by the term "throat" in contrast to

turbulators. Nor does the description comprise a specific definition in this regard. The Board therefore considers that there is no reason to adopt such a more limited interpretation.

4. As regards the expression "at its upstream end" of the branch, the Board does not share the view of the appellant that this expression should be entirely disregarded when comparing the subject-matter of claim 1 with the prior art. The Board also does not consider this expression to be limited to designate the upstream most end point of a branch, as argued by the respondent in the oral proceedings before the Board, or to designate an upstream end portion as extending a maximum of 10% of the total branch length, as argued previously before the opposition division. These are rather arbitrary limitations of the claimed expression, for which there is no basis in the claim or elsewhere in the patent.

The Board also cannot see that the term "end" would be more specific in regard to its extension than the terms "region" or "portion", as considered by the opposition division.

In its broadest, technically reasonable interpretation, the Board sees the upstream end of a flow duct to be the upstream half, the downstream end of the flow duct the downstream half thereof.

The Board further notes that a broad interpretation of the upstream end does not imply a specific limit for the extension of the upstream end of a branch. It has rather to be decided on a case-by-case basis whether the skilled person would reasonably consider, for a given apparatus of the prior art, that the relevant

feature is indeed situated "at the upstream end" of a respective branch.

During the oral proceedings before the Board the respondent presented a specific graphic interpretation of the extension of a throat at the upstream end of the branch, based on Figures 2 and 3 of the patent. However, in the absence of any support for the underlying assumptions in the further parts of the patent used for this interpretation, the Board is not convinced by this argument.

5. Taking into account the interpretation of the features of the characterising portion of claim 1 as set out here in points 3. and 4., the Board reaches the following conclusion in regard to the disclosure in D1.

Figure 5 of D1 shows a cooling passage 56 which can undisputedly be identified with the branch defined in the characterising portion of claim 1. The (circumferential) ridges 74 in this cooling passage 56 shown in Figure 5 and described in paragraph 33 of D1 indeed present constricted flow areas within the meaning indicated in point 3. above. As mentioned above, at least to a certain extent and depending on the specific fluid flow conditions (which are not defined in claim 1) these ridges will also provide for an increase in flow velocity. They consequently form throats within the meaning of claim 1. This had also been acknowledged by the opposition division. As the potential differences in terms of shape, scale and function between a turbulator and a general throat are not reflected in claim 1 (see above), the Board disagrees with the respondent's argument that the turbulators of D1 cannot be equated in a technically reasonable way with the claimed throat.

Moreover and contrary to the opposition division and the arguments of the respondent, the Board considers that paragraph 33 also discloses that the identified branch shown in Figure 5 comprises a ridge i.e. a throat also at its upstream end. Paragraph 33 of D1 discloses that the "turbulated cooling passages 56 include ridges 74 formed along their length to create turbulence". The Board agrees with the appellant that this would be understood by the skilled person to mean that ridges are indeed provided over the entire length. The upstream most ridge would then be provided necessarily at the upstream end of the cooling passage or branch. In this respect it is not relevant that the Figures 3 and 5 do not show ridges disposed over the entire length of the respective cooling passage. Indeed Figure 5 only illustrates a top cross-sectional view of two turbulated, curved cooling passages provided with ridges (see paragraph 14 of D1), and it is not apparent that the illustrated view represents the entire passage length. Nevertheless, the literal teaching in paragraph 33 ("along their length") is unambiguous as to the extension of the ridges within that passage.

The Board therefore concludes that, in addition to the features defined in the preamble of claim 1, the features in the characterising portion are also disclosed in D1, so that the subject-matter of claim 1 lacks novelty (Article 54(1) and (2) EPC).

6. It follows that the opposition ground under Article 100(a) in combination with Article 54 EPC prejudices maintenance of the patent as granted, so that the respondent's main request cannot be allowed.

Auxiliary requests 1 to 3 and request for remittal to the opposition division

7. The Board decided to not take auxiliary requests 1 to 3 into account because the respondent failed to substantiate these requests in its reply to the appellant's statement of grounds of appeal, contrary to the requirements set out in Article 12(4) RPBA 2007 by reference to Article 12(2) RPBA 2007 .
- 7.1 It is undisputed that auxiliary requests 1 to 3 are identical to auxiliary requests 1 to 3 submitted during the opposition procedure. Nevertheless, when re-submitting these requests with its reply to the statement of grounds of appeal, the respondent omitted any comment in respect to the question of why the amendments to the independent claims of the respective auxiliary request might overcome the outstanding objections and therefore might justify amending the impugned decision (see Article 12(2) RPBA 2007) in the sense that the patent could be maintained in a correspondingly amended form.
- 7.2 The respondent's argument that such justification was provided already before the opposition division and therefore not required to be repeated when filing its reply to the appeal grounds fails already in view of the very wording of Article 12(2) RPBA 2007 (referred to in Article 12(4) RPBA 2007), stating that the reply should specify expressly *inter alia* all the facts and arguments relied on.
- 7.3 Moreover, in its statement of grounds of appeal the appellant had raised specific objections under Articles 84 and 123(2) EPC against the amendments of the claims in auxiliary requests 1 to 3, to which the respondent

gave no consideration at all in its reply. Clearly these corresponding objections could in any case not have been replied to by the respondent when the auxiliary requests had been first filed in the opposition proceedings. That the clarity objections against the claims of auxiliary requests 1 and 2 were unsubstantiated or incomprehensible and would thus not have required a response, as argued by the respondent in the oral proceedings before the Board, is also found unconvincing. The Board cannot see that, for example, the appellant's objection under Article 84 EPC to the terminology "relatively constricted" in auxiliary requests 1 and 2 (see above item IX.) would have necessitated more substantiation. Even if this were the opinion of the respondent when submitting its reply, the Board is not convinced by the view that a corresponding comment in this sense would have unreasonably increased the respondent's burden of cost and could therefore remain unreflected. For similar reasons, the Board also considers the somewhat short statement of the appellant questioning the disclosure of amended claim 1 of auxiliary request 3 to be sufficiently substantiated and thus required a reply from the respondent. This is so because the amendments to the corresponding independent claim in the present case are considerable (see item VIII. above) and it is not immediately apparent from which part of the application as filed such subject-matter may be derived.

- 7.4 The Board also rejects the respondent's view that the Rules of Procedure of the Boards of Appeal would provide only guiding principles for the conduct of an efficient procedure and should not be applied too strictly to the detriment of the patent proprietor, in particular in cases, such as the present, where

auxiliary requests were already submitted in the opposition proceedings but were not considered because the opposition against the patent was rejected. Article 23 RPBA 2007 explicitly states the binding nature of the Rules of Procedure upon the Boards of Appeal, provided that they do not lead to a situation which would be incompatible with the spirit and purpose of the Convention. The Board cannot see that Article 12(2) RPBA 2007 would introduce such incompatibility when setting out the same requirements for all parties to the proceedings, appellant and respondent, opponent and patent proprietor. In the same way as the appellant-opponent has to raise and substantiate all objections it intends to pursue in the appeal proceedings in the statement of grounds of appeal, irrespective of the fact that they had already been raised in the opposition proceedings, the respondent-proprietor is required to present all facts and arguments in its reply to support and substantiate its requests for maintenance of the patent, be it as granted or in amended form according to the auxiliary requests submitted with the reply. The Board therefore cannot see that the application of the Rules of Procedure under the present circumstances would solely be to the detriment of the respondent.

8. The Board also rejects the respondent's request for a remittal of the case to the first instance under the above circumstances (auxiliary requests 1 to 3 not being taken into account).
- 8.1 At the oral proceedings, the respondent requested that the request for remittal be dealt with before a decision was taken on the issue of admittance of the auxiliary requests. As justification for this prioritisation of the request for remittal, the

respondent submitted that in the event of a remittal to the opposition division, the requests that had been filed in the opposition proceedings, thus also including auxiliary requests 1 to 3, could then be further pursued since they were part of the opposition proceedings.

8.2 According to Article 111(1) EPC the Board of Appeal may either exercise any power within the competence of the department which was responsible for the decision appealed or remit the case to that department for further prosecution. It is clear from this provision that it is up to the Board of Appeal to decide in which form it exercises its competences. This means that there is no right of the parties to choose in which form the Board of Appeal should exercise its competences under Article 111(1) EPC. Thus, the Board is entitled to decide on the issue of admittance of the auxiliary requests without being bound to the respondent's request for prioritisation of the request for remittal.

8.3 Furthermore, the reasons given by the respondent for prioritising the request for remittal are not convincing for the following reasons. Prioritising the request for remittal would have the effect of circumventing the substantiation requirements of Article 12(2) RPBA 2007, as this provision does not apply in opposition proceedings. The respondent's request for prioritisation of the request for remittal therefore comprises implicitly the request not to apply the substantiation requirements of Article 12(2) RPBA 2007. It is evident that such a request, which is against the applicable law, cannot be followed.

8.4 A case can only be remitted if it is clear on what basis the opposition division should further proceed. In the present case, the Board of Appeal decided on the respondent's main request and did not admit auxiliary requests 1 to 3 into the proceedings. The Board of Appeal also dealt itself with auxiliary request 4 (see point 9 below). Thus, there are no requests left on the basis of which the opposition division could proceed. The request for remittal is therefore rejected.

Auxiliary request 4

9. The subject-matter of amended claim 1 of auxiliary request 4 extends beyond the content of the application as filed, contrary to the requirement of Article 123(2) EPC.

9.1 The added feature "in a region of a first of the at least two branches downstream of the throat including a plurality of spaced-apart turbulators" is based on paragraph 21 of the application as filed (reference is made to the published international application, WO 2013/188869 A1, underlying the patent in suit). This paragraph relates to a specific embodiment of the turbine airfoil apparatus illustrated in Figures 2 and 3. Accordingly, this apparatus comprises first and second branches, both branches comprising two regions. The upstream region of each branch comprises a throat. Only the downstream region of the first branch is provided with the plurality of turbulators. Cooling air exits this downstream region including the turbulators through a plurality of film cooling holes (see in particular the passage of paragraph 21 starting in the second line on page 5 of the published application). There is no indication in paragraph 21 nor in any other part of the original application - at least no such

passage was indicated by the respondent and the Board on its own motion is unable to find a corresponding disclosure - that the cooling air may exit the region provided with the turbulators by any other means than by the film cooling hole(s) provided in that same region. Despite the preamble of claim 1 defining the presence of at least one film cooling hole, its location is not linked to any particular branch or region referred to in the amended claim, let alone to the specific region disclosed in combination with the turbulators in paragraph 21 and Figures 2 and 3. At least this feature disclosed in combination with the added feature in the cited paragraph on which amended claim 1 is based, has been omitted when amending claim 1 with the above cited feature. Absent any further source of disclosure, the resulting subject-matter, which extends to embodiments in which no film cooling hole is provided in the region provided with the turbulators, is not directly and unambiguously derivable from the application as filed.

- 9.2 The Board does not share the respondent's view that the turbulators are disclosed in a general manner. In fact, the passage referred to in paragraph 21 is the only passage which mentions turbulators in the cooling arrangement of the turbine airfoil apparatus's endwall. As set out above, there is nothing in this paragraph which would lead the skilled person to generalise that disclosure. That some features disclosed for the specific embodiment of Figures 2 and 3 were to be found in originally filed dependent claims, and were thus to be seen as optional features for the subject-matter of the independent claim, does not mean that all other features disclosed in the context of the specific embodiment are also optional for that embodiment. The original dependent claims neither define turbulators,

nor are the film cooling holes in the region comprising the turbulators in the specific embodiment of Figures 2 or 3 presented as optional to that embodiment. Whether the presence of the film cooling holes is linked to the effect sought by the turbulators, which effect is not even defined in the claim, is not decisive in the present case. The embodiment concerns a specific cooling arrangement and it is not disclosed that only (an arbitrary) part of the effects was intended to be achieved.

10. Absent any set of claims which would meet the requirements of the EPC, the request of the appellant to revoke the patent must be allowed (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. Hannam

Decision electronically authenticated