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Datasheet for the decision of 11 May 2026

Case Number: T 1494/24 - 3.2.01

Application Number: 18306459.1

Publication Number: 3650349

IPC: B64D15/20, B64D15/12, B64D15/14

Language of the proceedings: EN

Title of invention:
DE-ICING SYSTEM AND METHOD

Patent Proprietor:
Ratier-Figeac SAS

Opponent:
Safran Aircraft Engines

Headword:

Relevant legal provisions:
EPC Art. 54, 56
RPBA 2020 Art. 12(3)

Keyword:
Novelty - main request (no)
Inventive step - auxiliary requests (no)
Statement of grounds of appeal - reasons set out clearly and concisely (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
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Beschwerdekammern

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Case Number: T 1494/24 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 11 May 2026

Appellant: (Opponent)	Safran Aircraft Engines 2 boulevard du Général Martial Valin 75015 Paris (FR)
Representative:	Santarelli Tour Trinity 1 bis Place de la Défense 92400 Courbevoie (FR)
Respondent: (Patent Proprietor)	Ratier-Figeac SAS Avenue Ratier BP 2 46101 Figeac Cedex (FR)
Representative:	Dehns 10 Old Bailey London EC4M 7NG (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted/ electronically transmitted on 25 October 2024 concerning maintenance of the European Patent No. 3650349 in amended form.**

Composition of the Board:

Chairman	G. Pricolo
Members:	J. J. de Acha González
	O. Loizou

Summary of Facts and Submissions

I. The opponent filed an appeal against the Opposition Division's decision that the patent, as amended according to the main request, met the requirements of the EPC.

II. The following documents are relevant for the present decision:

D1: FR 2 914 906 A1;
D2: US 2014/0191084 A1; and
D3: EP 2 428 447 A2.

III. The Opposition Division concluded among others that the subject-matter of claims 1 and 7 was new over D1 and involved an inventive step in view of:

- D2 in combination with D3 or common general knowledge;
- D3 in combination with D2 or common general knowledge; and
- D3 in combination with D1.

IV. In its communication pursuant to Article 15(1) RPBA (Rules of Procedure of the Boards of Appeal), dated 12 February 2026, and in preparation for the oral proceedings set for 11 May 2026, the Board expressed its preliminary opinion on the case. The Board stated that the Opposition Division's conclusions in its decision seemed incorrect with regard to the novelty of the subject-matter of claim over D1. Regarding the first auxiliary request, the Board stated that only the inventive step objections based on D2 or D3 combined with the common general knowledge of a person skilled

in the art appeared to be substantiated in the appellant's statement of grounds of appeal.

V. In a letter dated 23 April 2026, the respondent (patent proprietor) informed the Board that they would not be attending the scheduled oral proceedings.

VI. Oral proceedings before the Board were held on 11 May 2026. The appellant was present, but the respondent did not attend as announced.

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

The respondent (patent proprietor) requested in writing that the appeal be dismissed (main request), or, in the alternative, that the patent be maintained in amended form according to any of the auxiliary requests 1 and 2 filed with the statement of grounds of appeal.

VII. Claim 1 of the main request reads as follows (feature numbering according to the contested decision):

a *A method of de-icing an external surface (111) of a component (110) comprising;*
b *detecting that ice (130) has been shed from the external surface (111) of a component (110), by performing the steps of:*
c *applying power to a heating means (120) to provide heat to said external surface (111);*
d *sensing the temperature of the component (110);*
e *calculating the rate of change of temperature increase of the external surface (111) over time;*
f *detecting a change in said rate of change of temperature increase over time,*
g *wherein said detected change in rate of change of*

temperature increase indicates that said ice has been shed from said external 15 surface (111) of said component (100);

h *the method of de-icing the external surface (111) of the component (110) further comprising the step of, in response to the detection of said ice (130) being shed from said external surface (111), reducing or stopping the power applied to said heating means (120).*

Claim 1 of the auxiliary request 1 differs from claim 1 of the main request in that the term 'component' is replaced with 'blade of (110) an aircraft propeller' in the first instance, and 'blade' in the remaining instances.

Claim 1 of the auxiliary request 2 differs from claim 1 of the auxiliary request 1 in that the feature g reads as follows (differences underlined by the Board):

g *wherein said detected change in rate of change of temperature increase indicates that said ice has been shed from said external 15 surface (111) of said blade (100), <u>if the change in said rate of change of temperature exceeds a threshold</u>;*

Reasons for the Decision

1. *Main request - Novelty*

1.1 The subject-matter of claim 1 is not new in view of the de-icing method disclosed in D1 (Article 54 EPC).

The main request corresponds to the main request underlying the decision under appeal.

Claim 1 is identical to granted claim 1.

1.2 The Opposition Division concluded that D1 did not disclose feature h.

1.3 This is the only feature contested by the parties as regards novelty of the subject-matter of claim 1 over D1.

1.4 Regarding the wording of feature h, the respondent and the Opposition Division are correct in that the wording establishes a direct causal link: the detection of shedding must trigger the specific action of reducing or stopping power with a certain degree of immediacy. Maintaining power unchanged for a while before reducing or stopping it might arguably fall within the claimed wording if the delay is minor (e.g., inherent processing) and the eventual reduction is still causally tied to the detection. However, prolonged maintenance would break the causal responsiveness. The patent's description repeatedly ties the invention to prompt power savings ("immediate detection... immediately halted" [0042]; "following the detection... reduced" [0034]; prevents "excessive power" after shedding [0035]). A significant delay where power stays high (or rises) post-shedding undermines the efficiency goal and wouldn't be seen as "in response to" the detection.
So the phrasing conveys direct causation, implies promptness without mandating strict immediacy, and excludes deliberately chosen intermediate phases.

1.5 The appellant is however right in that the method disclosed in D1, with reference to Figure 4, shows feature h. Figure 4 is schematic, and the description on page 31 clearly states that shed ice is detected by identifying changes in the rate of temperature increase from parts 18 and 20 of the temperature vs. time curve (see also the alternative methods of shed ice detection by comparing the derivatives P1, P2 and P3 of the temperature vs. time curve on page 27). Once this change is detected, the cooling phase begins, which is carried out without heating. The third operating mode is disclosed, making reference to the previous two. These modes all present the prolongation of the heating phase after the detection of shed ice as optional (see page 19, lines 3 to 15: 'de préférence'; page 20, second paragraph: 'avantageusement'; page 21, first paragraph: 'de manière préférée'; page 23, second paragraph: 'éventuellement'), contrary to the conclusions of the Opposition Division (see point 14.9 of the contested decision).

Consequently, feature h is disclosed in D1.

2. *Auxiliary request 1 - inventive step*

2.1 The subject-matter of claim 1 does not involve an inventive step in view of the combination of D1 with D3 (Article 56 EPC).

2.2 The auxiliary request 1 corresponds to the auxiliary request 1, which was filed during the opposition proceedings and on which the Opposition Division did not get to decide in view on its conclusion regarding the main request.

Claim 1 is a combination of granted claims 1 and 2.

Granted claim 2 specifies that the component is a blade of an aircraft propeller (referred to as feature **i** in the following).

2.3 In its communication under Article 15(1) RPBA, the Board expressed concerns regarding the substantiation of the inventive step objections against the subject-matter of claim 1 of the auxiliary request 1, as set out in the appellant's statement of grounds of appeal. Specifically, the Board considered that the appellant had at most substantiated the combinations of D2 or D3 with common general knowledge of the skilled person (see point 2.2 of the communication).

The respondent did not raise any objections or arguments regarding the substantiation of the attacks on inventive step of claim 1 of auxiliary request 1.

However, the appellant is correct that the objection of lack of inventive step of D1 in combination with D3 is substantiated in their statement of grounds of appeal. In particular, the appellant set out the reasons why the subject-matter of claim 1 of the main request lacked novelty in view of D1. Furthermore, under point 7.1, which addressed the additional features of the granted dependent claim 2 and was referred to when considering the inventive step of claim 1 of auxiliary request 1 (see point 8.1 of the statement of grounds of appeal), the appellant addressed the problem arising from feature i and explained why the proposed solution was obvious in view of D3. Therefore, the requirements of Article 12(3) RPBA are met, since the appellant clearly and concisely set out in their statement of grounds of appeal the reasons why the decision under appeal should be reversed, expressly specifying the

objections, arguments and evidence relied on regarding the lack of inventive step of the subject matter of claim 1 of auxiliary request 1, in view of the combination of D1 and D3.

The same reasoning applies to the subject-matter of claim 1 of the auxiliary request 2, in view of point 8.2 of the appellant's statement of grounds of appeal.

2.4 The subject-matter of claim 1 differs from the method of D1 on account of feature i.

2.5 The appellant formulated the objective technical problem as de-icing a moving aircraft surface.

The respondent did not object to the formulation of the objective technical problem and the Board concurs with it.

2.6 The respondent argued that D3 did not directly and unambiguously disclose the application of its ice-detection method to propeller blades. The single reference to propellers in paragraph [0047] had no clear connection to the actual method of the invention disclosed therein. They contended that D3 focused primarily on known de-icing structures and, more specifically, on wings, with the core method (detecting ice via the rate of change of surface temperature) only being introduced from paragraph [0048] onwards in the context of wings. Therefore, they concluded that D3 failed to provide a direct and unambiguous teaching of using the disclosed method on propellers.

2.7 These arguments do not hold for the following reasons. Although the reference to propellers is brief in paragraph [0047], D3 explicitly states that a similar

arrangement may be provided on other exposed parts of the aircraft structure, such as on propeller leading edges. The core detection principle — heating the surface and monitoring sudden changes in the rate of temperature increase to detect ice — is presented in general terms and is not limited to wings. Moreover, the relevant question is whether the skilled person would obviously consider applying the teaching to propellers. Given that D3 itself mentions propeller leading edges and propellers are a well-known critical icing surface, adapting the method of D1 is a straightforward and obvious step in view of the disclosure of D3.

D3 teaches exactly the same core technical principle as the patent in suit and D1: it uses a heater for the surface, monitors the rate of change of surface temperature while heating, and detects the presence (or shedding) of ice through sudden deviations in that rate of change (see figure 4 and paragraphs [0063]–[0065]). D3 even describes this approach as a way to detect both the formation of ice and the moment the ice layer is removed as in D1.

The skilled person would therefore immediately recognise that the heater-plus-temperature-sensor-plus-rate-of-change technique disclosed in D1 can be straightforwardly applied to propeller blades, which are well-known icing-prone surfaces. No inventive step is required; D3 teaches that the detection principle with its hardware and method is suitable for propellers.

Consequently, it would be obvious in view of D3 to apply the ice-detection method of D1 to propeller blades.

3. *Auxiliary request 2 - inventive step*

3.1 The subject-matter of claim 1 of auxiliary request 2 does not involve an inventive step in view of the combination of D1 with D3 (Article 56 EPC).

3.2 As the amended feature g in claim 1 is implicitly disclosed in D1, the same reasoning applies to the subject matter of claim 1 of auxiliary request 2 as to that of claim 1 of auxiliary request 1.

3.3 In particular, the use of a threshold is already implicit in granted claim 1. The claim requires the detection of a "change" in the rate of temperature variation, and that this change indicates ice shedding. However, not every change in the rate of temperature increase corresponds to ice shedding — only a sudden or brutal change does. For the claimed method to work reliably, it is therefore implicitly necessary to associate ice shedding with a certain threshold value of variation in the rate of temperature change.

The same reasoning applies to the method disclosed in D1. In D1, Figure 4 shows a sudden increase in the heat transfer coefficient at the moment of ice shedding. D1 explicitly describes determining the end of the temperature plateau (corresponding to the ice accretion phase) by detecting the transition of the temperature slope from a weakly positive value below a first threshold to a strongly positive value above a second threshold. Thus, D1 implicitly relies on a threshold to detect the passage from a slowly evolving temperature to a suddenly and rapidly evolving temperature. Since temperature evolves continuously, detecting this

transition necessarily involves applying a threshold to the rate of change.

Claim 1 of the auxiliary request 2 does not specify any particular value or order of magnitude for the threshold either. Even a threshold on the order of the measurement precision of the sensor would anticipate the claimed feature. Consequently, any practical detection device — including those of D1 and D3 — inherently implements and discloses such a threshold. In reality, the detection of any phenomenon based on the evolution of a parameter always requires an implicit threshold; without one, the system would react continuously and could lead to constant oscillations between activation and deactivation. Such a threshold is also explicitly disclosed in D3 (see paragraphs [0017] and [0065]).

3.4 In their appeal submissions, the respondent did not refute the appellant's argument regarding the implicit disclosure of a threshold in claim 1 of the patent and D1.

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:

M. Schalow G. Pricolo

Decision electronically authenticated