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Datasheet for the decision of 13 May 2016

Case Number: T 0915/14 - 3.2.01

Application Number: 07874271.5

Publication Number: 2219946

IPC: B64D13/02, B64D13/06

Language of the proceedings: EN

Title of invention:
CABIN AIR AND HEAT EXCHANGER RAM AIR INLETS FOR AIRCRAFT ENVIRONMENTAL CONTROL SYSTEMS, AND ASSOCIATED METHOD OF USE

Patent Proprietor:
The Boeing Company

Opponent:
Airbus Operations GmbH

Headword:

Relevant legal provisions:
EPC Art. 123(2), 123(3)

Keyword:
Extension beyond the content of the application as originally filed- Main Request and Auxiliary Requests 2 to 12 (yes)
Amendment-Broadening of scope of protection-Auxiliary Request 1 (yes)

Decisions cited:

Catchword:

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Case Number: T 0915/14 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 13 May 2016

Appellant: (Patent Proprietor)	The Boeing Company 100 North Riverside Plaza Chicago, IL 60606-1596 (US)
Representative:	Howson, Richard G.B. Kilburn & Strode LLP 20 Red Lion Street London WC1R 4PJ (GB)
Respondent: (Opponent)	Airbus Operations GmbH Kreetslag 10 21129 Hamburg (DE)
Representative:	Schicker, Silvia Wuesthoff & Wuesthoff Patentanwälte PartG mbB Schweigerstraße 2 81541 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 24 February 2014 revoking European patent No. 2219946 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	G. Pricolo
Members:	Y. Lemblé
	S. Fernández de Córdoba

Summary of Facts and Submissions

I. The appeal of the Patent Proprietor is directed against the decision of the Opposition Division to revoke the European patent No. 2 219 946.

II. In its decision the Opposition Division held that the contested patent contained subject-matter which extended beyond the content of the application as originally filed D0: WO-A-2009/064288 (Article 100 (c) EPC 1973).

III. Oral proceedings were held before the Board on 13 May 2016.
The Appellant requested that the decision to revoke the patent be set aside and the patent be maintained as granted (Main Request), or in the alternative, on the basis of one of the Auxiliary Requests 1 to 12 filed with letter dated 24 March 2016.
The Respondent requested the dismissal of the appeal.

IV. Claim 1 as granted (main request) reads as follows:

1. An environmental control system -ECS (200)- for use with an aircraft (300), the ECS (200) comprising:
a ram air inlet (201) in flow communication with a ram air inlet duct (209) for receiving a flow of outside air;
a ram air outlet (202) in flow communication with the ram air inlet duct (209); and
a controller (220) operably coupled to the ram air outlet (202) and the ram air inlet (201), wherein the ram air inlet (201) includes a variable inlet opening (224) and the ram air outlet includes a variable outlet opening (225), and wherein the controller modulates the variable inlet opening (224) and the variable outlet

opening (225) during operation of the ECS (200) to increase the air pressure in the inlet duct (209) and thereby reduce aerodynamic drag.

Claim 8 as granted reads as follows:

A method of operating an environmental control system - ECS (200)- on an aircraft (300) in flight, the method comprising:
receiving a flow of outside air in a ram air inlet duct (209);
modulating a ram air inlet opening (224) in flow communication with the ram air inlet duct (209); and
modulating a ram air outlet opening (225) in flow communication with the ram air inlet duct (209),
wherein the ram air inlet opening (224) and the ram air outlet opening (225) are modulated to increase the air pressure in the inlet duct (209) and thereby reduce the aerodynamic drag caused by the ECS (200).

In claim 1 and method claim 8 of the Auxiliary Request 1 the wording "to increase the air pressure in the inlet duct and thereby reduce aerodynamic drag" (wording A of claims 1 and 8 of the Main Request) has been replaced by the following wording: "to increase the air pressure in the inlet duct and reduce aerodynamic drag" (wording A0).

Claim 1 and/or the method claim of all the further Auxiliary Requests 2 to 12 either include wording A ("to increase the air pressure in the inlet duct and thereby reduce aerodynamic drag") or the wording "to increase the air pressure recovery factor in the inlet duct and thereby reduce aerodynamic drag".

V. The Appellant's submissions may be summarized as follows:

Contrary to the Opposition Division’s decision, the term "thereby" in the last feature of claim 1 as granted did not imply a causal link between an increase in air pressure in the inlet duct and a reduction in aerodynamic drag. From the content of the application as originally filed and published as W0 2009/064288 (D0) the skilled person would clearly recognise that the wording "and thereby reduce aerodynamic drag" only served to clarify that the modulation by the controller of the variable inlet opening and the variable outlet opening during operation of the ECS reduced aerodynamic drag in addition to an increase of the air pressure in the inlet duct and not that an increase in pressure in the inlet duct caused a reduction in aerodynamic drag. For example page 2, lines 24 to 28 of D0, mentioned that "… the controller automatically modulates at least one of the variable inlet opening and the variable outlet opening on a specific schedule during operation of the aircraft to reduce the aerodynamic drag associated with the ECS ram system and increase the air pressure recovery in the inlet duct". A skilled person would therefore understand claim 1 of the patent to mean that the modulation by the controller caused the reduction in aerodynamic drag and the increase of air pressure in the inlet duct. Any other interpretation would be contrary to the context of D0. In the same way, page 5, lines 22-26 and page 6, lines 18-24 in D0 unambiguously severed the idea of a causal link between the increase in pressure in the inlet duct and the reduction of aerodynamic drag.
With regard to "air pressure in the inlet duct" in claim 1 of the patent and the term "air pressure recovery in the inlet duct" as mentioned in D0, there

was a direct relationship between the two terms. The Opposition Division had erred in its conclusion that document D8 (extract from Fundamentals of Compressible Fluid Dynamics, P. Balachandran) suggested that there was no single definition between the pressure recovery factor and the pressure. The patent used air pressure recovery or air pressure recovery factor to measure performance. In document D8, this was termed stagnation pressure recovery factor. A skilled person would understand that air pressure recovery factor and stagnation pressure recovery factor were one and the same. The reference to pressure in claim 1 as granted, would be understood by a skilled person to correspond to the actual total stagnation pressure in the equation (11.2) of D8. From consideration of the above equation, which was an accepted industry definition of pressure recovery factor, a skilled person would accordingly understand that there was a direct relationship between the pressure specified in claim 1 and the pressure recovery factor mentioned in D0. The claim did not therefore contravene Article 123(2) EPC.

In the First Auxiliary Request, the independent claims of the Main Request had been further limited by the deletion of the term "thereby" (see independent claims 1 and 8). The deletion of the term "thereby" resulted in a meaning which was in fact narrower in scope than that of claim 1 as granted. This was because the further limitation that the modulation by the controller of the variable inlet and variable outlet opening reduced aerodynamic drag meant that the aerodynamic drag was actively reduced. This amendment was thus a limitation of the claims of the patent as granted and therefore did not contravene Article 123(3) EPC nor Article 123(2) EPC.

VI. The Respondent countered essentially as follows:

The words "and thereby" specified a causal relationship between drag reduction and pressure increase, which was clearly not disclosed in the original disclosure D0, particularly not in original independent claim 11 and not in the original description. The claimed relationship was also not derivable from the drawings. The patentee correctly asserted that the original application D0, as understood by the skilled person, did not teach a causal relationship between pressure increase and drag reduction, while the adverbial clause "and thereby" did not allow for any other interpretation but subordinating the drag reduction to the pressure increase, thus extending beyond the content of the original disclosure D0. While claim 1 was unambiguous as to the causal relation, the original disclosure D0 was ambiguous as to the cause of the reduction in aerodynamic drag. Auxiliary requests 2 to 12 had the same defect.

In Auxiliary Request 1, the deletion of the term "thereby" from granted claims 1 and 8, as correctly found by the Opposition Division in its decision, resulted in a broadening of the scope of protection conferred by granted claims 1 and 8 and violated Article 123(3) EPC.

Reasons for the Decision

1. The appeal is admissible.

2. Main request; Extension beyond the content of the application as originally filed (Article 123(2) EPC)

2.1 The Opposition Division held that the contested patent contained subject-matter which extended beyond the content of the application as originally filed D0: WO-A-2009/064288 (Article 100 (c) EPC 1973) because the wording "to increase the air pressure in the inlet duct and **thereby** reduce the aerodynamic drag" in claim 1 and method claim 8 as granted (wording A) implied a causal link between drag and air pressure which was not disclosed in D0 and therefore contravened Article 123(2) EPC.

2.2 If claim 1 as granted is compared with claim 1 of the application as originally filed D0, no basis can be found for wording A in the original claim. Indeed, claim 1 as filed refers to the structural configuration of an environmental control system (ECS) and does not contain the method features specifying a "controller [which] modulates the variable inlet opening and the variable outlet opening during operation of the ECS to increase the air pressure in the inlet duct and thereby reduce aerodynamic drag". As mentioned by the Opposition Division, these features derive from the method claim 11 as originally filed, however with a different wording ("to increase the air pressure in the inlet duct and reduce the aerodynamic drag caused by the ECS": wording A0).

2.3 In terms of method features, wording A of granted claims 1 and 8 contains the word "thereby" which implies a causal relationship between the increase of the air pressure in the inlet duct, as a result of the modulation of the ram air inlet opening and the ram air opening, and the aerodynamic drag. This causal link was apparently deliberately introduced in claim 1 and method claim 8 as granted in examination proceedings (see letter of the Appellant dated 30 July 2010, page

2, third paragraph from below). Even in opposition proceedings the Appellant maintained that claims 1 and 8 as granted taught a specific relationship between the pressure and the drag (see page 1, fourth paragraph of the minutes of the oral proceedings before the Opposition Division). The application as originally filed D0 does not, however, disclose this causal relationship.

2.4 In appeal proceedings the Appellant relied on several passages of D0 (page 2, lines 24 to 28; page 5, lines 22-26; page 6, lines 18-24) to assert that the skilled person would interpret the claims and readily understand that the word "thereby" did not introduce a causal link and only meant that it was the modulation by the controller which caused the reduction in aerodynamic drag and the increase of air pressure in the inlet duct.

The Board judges that the wording of the claim is not open to interpretation, the term "thereby" undoubtedly introducing the above-mentioned causal link. Referring the term "thereby" to the wording "the controller modulates", as is the Appellant's intention in these appeal proceedings, simply does not make sense, both in terms of logic and grammar. But even if the claim was open to interpretation, the description and the figures do not support the interpretation made by the Appellant.

Examining the passages cited by the Appellant, the Board notes that they all refer to a "pressure recovery factor" which should be optimized or a "pressure recovery" which should be improved or increased while simultaneously reducing the aerodynamic drag of the system. Fig. 6B of D0 shows that, if the drag should be minimized across a range of desired mass flows for operating the system, it is more advantageous for some

given mass flow requirements (especially in the range 0.2 to 0.5) to keep the inlet at a low opening percentage while optimizing pressure recovery, than to work with a wider inlet and a comparatively higher pressure recovery. Within this context of operating the ECS, even the original wording of claim 11 "modulated to increase the air pressure in the inlet duct and reduce the aerodynamic drag" (wording A0) does not seem fully consistent with the teaching which is reflected in Fig. 6A-6B, 7A-7B and 8A-8C (see especially first paragraph of page 13 in D0; [0038] of the patent specification) and which refers to the conjunction of an action on the inlet to reduce the system drag on the one hand, combined with an adjustment on the outlet opening position to increase air pressure **recovery** on the other hand.
Thus, there is no direct and unambiguous basis in D0 for wording A of claim 1, even with the interpretation proposed by the Appellant. As already noted by the Opposition Division, the air pressure in the inlet duct and the pressure recovery or pressure recovery factor in the inlet duct are not identical quantities and there is no indication in D0 that theses quantities might be strictly equivalent for all given inlet and outlet opening positions and under all operating circumstances of the ECS.

2.5 The Board concludes that the subject-matter of claims 1 and 8 of the granted patent extends beyond the content of the application as originally filed (Article 123(2) EPC).

3. Auxiliary request 1

The deletion of the term "thereby", i.e. the deletion of the causal relationship between the air pressure in

the inlet duct and the reduction of the aerodynamic drag, from granted claims 1 and 8 constitutes a deletion of a feature that makes a functionally limiting contribution to the way the claimed subject-matter operates, namely that the modulation of the variable inlet opening and the variable outlet opening leads to an increase in the air pressure in the inlet duct and, as a consequence, automatically reduces aerodynamic drag under all operating circumstances of the ECS. Claims 1 and 8 now include the possibility that the controller operates in such a manner that it modulates the variable openings by taking into account both the parameter air pressure and the parameter aerodynamic drag, i.e. the possibility that the controller includes a specific program (as a technical feature thereof) in which data relating to both parameters are processed. Claims 1 and 8 as granted, by defining that the reduction of aerodynamic drag is a direct consequence of an increase in air pressure in the inlet duct, implied the that only parameter to be taken into account was the air pressure in the inlet duct and consequently excluded the above-mentioned possibility. It results that, as correctly found by the Opposition Division in its decision, the deletion of the term "thereby" from granted claims 1 and 8 extends the scope of protection conferred by granted claims 1 and 8 and violates Article 123(3) EPC.

4. Auxiliary requests 2 to 12

All these requests contain wording A or an equivalent wording including the word "thereby", implying the above-mentioned causal relationship. It follows that these auxiliary requests must also be rejected because they extend beyond the content of the originally filed

application D0 (Article 123(2) EPC) for the same reasons as exposed in point 2 above.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Vottner G. Pricolo

Decision electronically authenticated