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**Datasheet for the decision
of 16 December 2011**

Case Number: T 1519/08 - 3.4.01

Application Number: 97202843.5

Publication Number: 829848

IPC: G10K 11/175

Language of the proceedings: EN

Title of invention:

Fluidic element noise and vibration control constructs and methods

Patentee:

The Boeing Company

Joint Opponents:

AIRBUS Deutschland GmbH
AIRBUS France SAS
AIRBUS UK Ltd
AIRBUS España S.L.
AIRBUS SAS

Headword:

-

Relevant legal provisions:

EPC Art. 56
EPC R. 99(1), 101(2)

Relevant legal provisions (EPC 1973):

EPC Art. 100(c)

Keyword:

-

Decisions cited:

T 0455/94, T 0736/95, G 0010/91, T 0467/02, T 0151/05,
T 1018/02

Catchword:

-



Case Number: T 1519/08 - 3.4.01

D E C I S I O N
of the Technical Board of Appeal 3.4.01
of 16 December 2011

Joint Appellants:
(Joint Opponents)

AIRBUS Operations GmbH
(ex AIRBUS Deutschland GmbH)
Kreetslag 10
D-21129 Hamburg (DE)

AIRBUS Operations SAS
(ex AIRBUS France SAS)
316, route de Bayonne
F-31060 Toulouse (FR)

AIRBUS Operations Ltd.
(ex AIRBUS UK Ltd.)
New Filton House, Filton
Bristol BS99 7AR (GB)

AIRBUS Operations S.L.
(ex AIRBUS España S.L.)
Avenida de John Lennon S/N
Madrid (ES)

AIRBUS SAS
1, Rond-Point Maurice Bellonte
F-31700 Blagnac (FR)

Representative:

Barth, Stephan Manuel
Reinhard, Skuhra, Weise & Partner GbR
Patent- und Rechtsanwälte
Friedrichstrasse 31
D-80801 München (DE)

Respondent:
(Patent Proprietor)

The Boeing Company
100 North Riverside Plaza
Chicago
IL 60606-2016 (US)

Representative:

Howson, Richard G.B.
Kilburn & Strode LLP
20 Red Lion Street
London WC1R 4PJ (GB)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 21 July 2008 rejecting the opposition filed against European patent No. 829848 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman: B. Schachenmann
Members: G. Assi
 F. Neumann

Summary of Facts and Submissions

- I. The joint appellants (joint opponents AIRBUS Deutschland GmbH, AIRBUS France SAS, AIRBUS UK Limited, AIRBUS España S.L. and AIRBUS SAS) lodged an appeal, received on 1 August 2008, against the decision of the opposition division, dispatched on 21 July 2008, rejecting an opposition against the European patent No. 0 829 848 (application number 97202843.5). The appeal fee was paid on 1 August 2008. The statement setting out the grounds of appeal was received on 21 November 2008.
- II. The opposition had been filed against the patent as a whole and was based on the ground pursuant to Article 100(a) EPC 1973 that the subject-matter of the patent was not patentable within the terms of Articles 52(1) and 56 EPC 1973 having regard to the following documents among others:
- (O1) US-A-5,540,248;
 - (O2) T.M. Drzewiecki et al., "*Acousto-fluidic drivers for use with active noise control systems*", CEAS-AIAA-95-060 Conference Proceedings, 1995, pages 455-463, ISBN 3-922010-85-7;
 - (O3) O. Bschorr, "*Fluidischer Antischallgeber*", Fortschritte der Akustik DAGA 1990, pages 501-504;
 - (O4) DE-A-40 11 658.
- III. Oral proceedings before the Board were held on 16 December 2011.
- IV. The joint appellants requested that the contested decision be set aside and the patent be revoked in its entirety.

Alternatively, the joint appellants requested that the case be remitted to the opposition division for further prosecution.

- V. The respondent (proprietor of the patent THE BOEING COMPANY) requested that the appeal be rejected as inadmissible.

Should the appeal be considered admissible, the respondent requested that the ground for opposition under Article 100(c) EPC 1973, raised by the joint appellants with a letter of 25 June 2008, not be admitted into the procedure.

Should the ground for opposition under Article 100(c) EPC 1973 be admitted into the procedure, the respondent requested that the case be remitted to the opposition division for further prosecution.

Moreover, the respondent requested that the patent be maintained as granted (main request) or in amended form in accordance with one of the auxiliary requests I-IV filed with a letter of 23 May 2008, with one of the additional auxiliary requests IIa and IIb filed with a letter of 20 March 2009 to be considered after the auxiliary request II, or with one of the additional auxiliary requests V, VI, VIa, VII, VIII and VIIIa filed with a letter of 13 October 2011 to be considered after the auxiliary request IV.

- VI. The wording of independent claims 1 and 9 according to the respondent's main request reads as follows:

"1. Construct for attenuating sound waves in a fluid environment, the construct comprising:

- (a) an array of fluidic elements (40a, 41a, 42a, 43a, 44a, 45a, 46a), at least some of the fluidic elements comprising fluidic amplifiers (41, 43, 45), the array having a face plate (46) and a back plate (40);
- (b) at least one fluid supply port (40b) in the back plate (40) for receiving a supply of fluid;
- (c) at least one input port (m) in the face plate (46) of the array for sensing sound pressure (55) in the environment where sound is to be controlled; and
- (d) at least one output port (p) in the face plate (46) in proximity to the input port (m), the output port adapted for outputting a sufficient volume of fluid into the environment where sound is to be controlled to counteract sound in the environment;
- (e) at least one dump port (40j) for dumping an unwanted portion of the amplified sound pressure extending from the back plate (40) of the array to a zone spaced a sufficient distance away from the face plate of the array to eliminate interference with output sound waves from the output port (p)."

"9. Method of absorbing sound waves in a fluid environment, the method comprising:

- (a) arranging a fluidic construct, comprising an array of fluidic elements (40a, 41a, 42a, 43a, 44a, 45a, 46a) in controlled fluid communication with each other, in the environment, the array having a face plate (46) facing the sound waves (55) to be absorbed;

- (b) *supplying a pressurized fluid to supply ports (40b, 40bb) of the fluidic construct;*
- (c) *sensing sound pressure of sound waves to be absorbed at input ports (m) in the face plate;*
- (d) *modulating the pressure of the supply fluid in response to the sensed sound pressure to generate first modulated fluid out of phase with the sensed sound waves and second modulated fluid in phase with the sensed sound waves, while flowing the supplied fluid though [sic] the fluidic elements;*
- (e) *outputting the first modulated fluid from first output ports (p) in proximity to the input ports (m) to reduce the sound pressure of the sound waves; and*
- (f) *outputting the second modulated fluid from second output ports (40j) arranged a sufficient distance away from the input ports to eliminate interference with output sound waves from the first output ports."*

The remaining claims 2-8 and 10-15 according to the respondent's main request are dependent claims.

Reasons for the Decision

1. The revised version of the European Patent Convention ("*EPC 2000*") entered into force on 13 December 2007. In the present decision, reference is made to "*EPC 1973*" for the EPC valid until that time or to "*EPC*" for the EPC 2000 (EPC, 13th Edition, Citation Practice, pages 4-6) depending on the version to be applied according to Article 7(1), second sentence, of the Revision Act dated 29 November 2000 (Special Edition

No. 1, OJ EPO 2007, 196) and the decisions of the Administrative Council dated 28 June 2001 (Special Edition No. 1, OJ EPO 2007, 197) and 7 December 2006 (Special Edition No. 1, OJ EPO 2007, 89).

2. **Admissibility of the appeal**

2.1 The respondent submitted (see letter of 20 March 2009, page 2) that the notice of appeal dated 1 August 2008 did not contain the name and the address of the appellant, contrary to the provisions of Rule 99(1)(a) EPC.

During the oral proceedings on 16 December 2011, the Board agreed that the notice of appeal filed on 1 August 2008 does not comply with Rule 99(1)(a) EPC, as the respondent had submitted, and invited the representative of the joint appellants to remedy this deficiency pursuant to Rule 101(2) EPC. In reaction thereto, the representative agreed to immediately remedy the deficiency noted and handed over an amended notice of appeal naming the joint opponents as the joint appellants (see minutes of the oral proceedings). The respondent agreed that the amended notice of appeal contained the names and the addresses of the joint appellants.

2.2 The respondent also submitted (see letter of 20 March 2009, page 2) that the notice of appeal did not contain a request defining the subject of the appeal, contrary to the provisions of Rule 99(1)(c) EPC.

However, the notice of appeal was filed against the opposition division's decision to reject the opposition

against the European patent No. 0 829 848. Under these circumstances, the very fact that a notice of appeal was filed clearly implies the request to set aside the contested decision and to revoke the patent.

2.3 The Board has no further objections concerning the admissibility of the appeal.

2.4 Therefore, the appeal is admissible.

3. **Ground for opposition under Article 100(c) EPC 1973**

3.1 The ground for opposition under Article 100(c) EPC 1973 was raised by the joint appellants with a letter of 25 June 2008 (see also the grounds of appeal, page 2, A1, first sentence) after the expiry of the time limit laid down in Article 99(1) EPC. It thus constitutes a fresh ground and was not admitted into the procedure by the opposition division (contested decision, Reasons, point 3).

3.2 The joint appellants held that a ground for opposition could also be implicit (decision T 455/94, unpublished). In the present case, paragraph B1 of the notice of opposition concerned the definition of the invention according to claim 1 of the granted patent, whereas paragraph B1.1 dealt with the issue of lack of clarity of claim 1. The observation in paragraph B1 that paragraph [0006] of the granted patent was incorrect because claim 1 did not comprise an essential feature of the invention, namely "*an array made up of a plurality of grouped stacks of sheets having cut out fluidic elements thereon*", should therefore be understood as implicitly relating to the ground for

opposition of Article 100(c) EPC 1973. It was held that it could be inferred from this observation that the general "array" of claim 1 included non-stacked arrangements of fluidic elements which were not originally disclosed.

In the Board's view, this argument is not convincing because the observation in paragraph B1 mentioned above does not necessarily imply an objection under Article 100(c) EPC 1973. Rather, it may be understood as an objection concerning an inconsistency between claim 1 and the description of the granted patent under Article 84 EPC 1973 which, however, is not a ground for opposition.

- 3.3 The joint appellants also submitted that the opposition division did not duly exercise its discretionary power to decide whether to admit the ground for opposition under Article 100(c) EPC 1973 into the procedure, because it did not sufficiently deal with the arguments produced by the joint appellants (decision T 736/95, OJ EPO 2001, 191). It could indeed be inferred from the minutes of the oral proceedings of 27 June 2008 before the opposition division (paragraph 2.3) that this issue was only briefly dealt with, despite the fact that the interpretation of the term "array" was a recurrent theme throughout the whole opposition proceedings.

The Enlarged Board of Appeal held in decision G 10/91 (OJ EPO 1993, 420) that "*An Opposition Division or a Board of Appeal is not obliged to consider all the grounds for opposition referred to in Article 100 EPC [1973], going beyond the grounds covered by the*

statement under Rule 55(c) EPC [1973]" (Headnote, point 1; underlining added).

With particular regard to the opposition proceedings the Enlarged Board of Appeal stated that "*In principle, the Opposition Division shall examine only such grounds for opposition which have been properly submitted and substantiated in accordance with Article 99(1) [EPC 1973] in conjunction with Rule 55(c) EPC [1973].*

Exceptionally, the Opposition Division may in application of Article 114(1) EPC [1973] consider other grounds for opposition which, prima facie, in whole or in part would seem to prejudice the maintenance of the European patent" (Headnote, point 2; underlining added).

In the present case, the opposition division, in the exercise of its discretionary power acknowledged in G 10/91, held that the ground under Article 100(c) EPC 1973 was not prima facie relevant and therefore disregarded it (contested decision, Reasons, point 3). The Board does not have any criticism against the opposition division's approach. The fact that in the oral proceedings before the opposition division this issue was only briefly dealt with corresponds to a prima facie assessment and cannot, as such, be considered as a procedural deficiency.

With regard to the appeal proceedings the Enlarged Board of Appeal unequivocally held that "*Fresh grounds for opposition may be considered in appeal proceedings only with the approval of the patentee" (Headnote, point 3; underlining added).*

In the present case, the respondent explicitly withheld its approval (letter of 20 March 2009, page 4, first paragraph).

3.4 For these reasons, the ground for opposition under Article 100(c) EPC 1973 is not admitted into the procedure.

4. **Respondent's request for remittal of the case to the opposition division**

Since the ground for opposition under Article 100(c) EPC 1973 is not admitted into the procedure, the respondent's request for remittal of the case to the opposition division for further prosecution is baseless.

5. **Ground for opposition under Article 100(a) EPC 1973 in connection with Article 56 EPC 1973 with regard to the respondent's main request**

5.1 As a step preliminary to the assessment of whether the subject-matter of claim 1 of the granted patent is inventive, the question of how said claimed subject-matter should be understood was considered. The discussion specifically concerned the feature (a) which relates to "*an array of fluidic elements, at least some of the fluidic elements comprising fluidic amplifiers, the array having a face plate and a back plate*" (reference numerals omitted).

5.1.1 An interpretation of the claimed subject-matter may be made by taking into account the whole context of the disclosure of the patent (decision T 467/02, unpublished; Reasons, point 2.3). The claimed

expression "*array of fluidic elements*" is defined in column 6 (lines 1-4) of the granted patent by stating that "*an array of fluidic elements will include several stacks, each of which has at least one, and preferably several, fluidic elements*". Moreover, with regard to the claimed "*fluidic elements*" it is noted that the description of the granted patent only discloses embodiments in which the fluidic elements are cut out of a sheet.

- 5.1.2 On the other hand, an ambiguous text may be construed against the interest of the person responsible for drafting it, i.e. the respondent in the present case, and in favour of the person on whom it is legally imposed, i.e. the joint appellants as members of the public in the present case (decision T 151/05, unpublished; Reasons, point 3.2.2). This would plead for a wide interpretation as advocated by the joint appellants. Thereby, although a claim must not be interpreted in a way which is illogical or does not make any sense, the description cannot be used to give a different meaning to a claim feature which in itself imparts a clear credible technical teaching to the skilled reader (decision T 1018/02, unpublished; Catchword).

With this approach, the joint appellants submitted that the claimed expression "*array of fluidic elements*" could be understood as meaning a plurality of fluidic elements arranged one aside another between a face plate and a back plate, the array not being made of stacks of sheets having cut out fluidic elements thereon, each fluidic element having an input port, an output port, a fluid supply port and a dump port. In

support of their submissions, the joint appellants drew attention to a letter of 14 April 2006 (page 2, first paragraph), in which the respondent stated that there was no justification for the introduction of the feature of the array being made of a plurality of grouped stacks of sheets having cut out fluidic elements thereon into the independent claims of the granted patent.

- 5.1.3 The joint appellants and the respondent, however, agreed that the construct of claim 1 of the granted patent essentially comprised an "*array of fluidic elements*" (independently of its exact meaning) having a face plate and a back plate (feature (a)), at least one fluid supply port in the back plate (feature (b)), at least one input port in the face plate (feature (c)), at least one output port in the face plate (feature (d)), and at least one dump port in the back plate (feature (e)). The provision of at least one dump port implies that the claimed construct is monopolar.

It is this combination of features, in particular the arrangement of the ports, which plays an essential role in the evaluation of inventive step, as will result from the following. With regard to the feature "*array of fluidic elements*", its exact meaning can be left open for the purpose of assessing inventive step.

- 5.2 The boards of appeal have repeatedly emphasised that the closest prior art document for assessing inventive step is normally a document disclosing subject-matter conceived for the same purpose or aiming at the same objective as the claimed invention and having the most relevant technical features in common, i.e. requiring

the minimum of structural modifications (Case Law of the Boards of Appeal of the EPO, Sixth Edition, 2010, paragraph I.D.3.1).

- 5.2.1 Document O1 (column 1, lines 5-9; column 2, line 45 to column 3, line 48) relates to means for providing high-gain, high-fidelity fluidic acoustic signal amplification, in particular for broadcasting amplified sound into large spaces over distances in the order of hundreds of feet, operable without electricity or mechanical moving parts. In this context, a so-called "*near-field cancellation*" is mentioned in column 11, lines 10-15. However, this means that when a speaker pair is situated near a sound source, audience members close to the source will hear the sound basically unamplified while those further away from the source will receive the benefit of the amplification.

The disclosure of O1 is thus not conceived for the same purpose as the claimed invention, i.e. active noise attenuation by fluidic elements.

For this reason, the Board agrees with the respondent (letter of 14 April 2006, page 2, third and fourth full paragraphs) and the opposition division (contested decision, Reasons, point 5.1) that O1 should not be regarded as a document representing the closest prior art.

- 5.2.2 Document O2 relates to the use of acousto-fluidic amplifiers to generate the acoustic power necessary to produce the anti-sound needed to actively reduce the noise generated by a turbofan engine. Such active noise suppression basically relies on the destructive

interference between unwanted sounds and sound generated by an active source in the form of an acoustic driver controlled by a computer algorithm that predicts the required amplitude and phase for the cancellation to occur. O2 draws attention to the emerging technology of acousto-fluidics that would permit a fluidic implementation of an acoustic driver and a fluidic microphone pickup. Figure 1 shows a notional light-weight low-cost acousto-fluidic driver operated by a low-power piezoelectric input source. The operating principle on which such a driver relies is explained in relation to Figure 2 which shows a so-called laminar proportional amplifier (LPA) considered to be the fundamental element for acousto-fluidic signal processing. This element, which is also shown in Figure 4, appears to operate in a similar way to the fluidic amplifier of Figure 1 of the granted patent. In this respect, O2 would be relevant. However, O2 envisages an active noise control system with an electric input. Figure 11 shows a prototype acousto-fluidic driver installed in the active noise control system on a turbofan engine. The driver is controlled by input speakers driven via a power amplifier by an algorithm receiving a signal from an error microphone.

Therefore, the Board agrees with the respondent (letter of 14 April 2006, paragraph bridging pages 2 and 3) and the opposition division (contested decision, Reasons, point 5.1) that O2 should not be regarded as a document representing the closest prior art.

5.2.3 Document O3 relates to a fluidic element for attenuating sound by destructive interference. It is clearly stated that the sound to be attenuated is taken

as the input signal of the fluidic element (Abstract). Figure 1(b) shows a fluidic amplifier corresponding to that of Figure 1 of the granted patent. In a bipolar arrangement ("*Zweipol-Schaltung*") both outputs of the fluidic amplifier are used. In a monopolar arrangement ("*Koinzidenzschaltung*") only one output is used, the other one being dumped.

Therefore, the Board agrees with the opposition division (contested decision, Reasons, point 5.1) that O3 can be considered as a closest prior art document.

5.2.4 Document O4 also relates to a fluidic element for attenuating sound by destructive interference, the sound to be attenuated being taken as the input signal of the fluidic element (column 1, lines 29-37). Figures 1-6 and 9 show bipolar arrangements, whereas Figures 7 and 8 show monopolar ones.

Therefore, the Board agrees with the opposition division (contested decision, Reasons, point 5.1) that O4 can also be considered as a closest prior art document.

5.2.5 The remaining documents mentioned in the notice of opposition (page 14, last paragraph) were cited merely as a precautionary measure. As they are not relied upon in the appeal proceedings, the Board has no reason to consider them.

5.3 The assessment of inventive step of the subject-matter of claim 1 of the granted patent made by the joint appellants is based on various approaches, in particular the combination of O4 with the common

general knowledge of a skilled person (grounds of appeal, page 15, D1), the combination of O3 with O1 (grounds of appeal, page 16, D2), and the combination of O1 with O2 (grounds of appeal, page 17, D3).

5.3.1 With regard to the combination of O4 with common general knowledge, the Board first notes that a fluidic amplifier of the kind shown in Figure 1 of the granted patent and its operation are known from O4 (Figure 2).

The basic bipolar arrangement according to O4 is shown in Figure 1 (see also claim 1). A fluidic amplifier 1 is provided in an undefined structure, in which a source 3 of periodic sound is arranged. The fluidic amplifier comprises an input port 5 connected to an end of a control duct 2, the other end of which is near the source of sound, and two output ports 41, 42 connected to acoustic adapters 6. As shown in Figures 2-4, the fluidic amplifier comprises a fluid supply duct 7, two control ducts 21, 22 and two output ducts 23. As already stated, the basic structure of the known fluidic amplifier 1 in principle corresponds to that of the fluidic amplifier 10 of Figure 1 of the granted patent.

Claim 1 of the granted patent essentially differs from the disclosure of O4 (Figures 1-4) in that it concerns a monopolar construct comprising an array of fluidic elements, at least some of which are fluidic amplifiers, the array having a face plate and a back plate, in that the input port(s) and the output port(s) are arranged in the face plate in proximity to each other, and in that the fluid supply port(s) and dump port(s) are arranged in the back plate.

The effect achieved by dumping modulated fluid in phase with the sensed sound waves in the back plate (monopolar arrangement) and by providing the output port(s) in proximity to the input port(s) in the face plate, as claimed, is the attenuation of sound waves across a broad frequency band in a reliable and a cost-effective manner (granted patent, paragraph [0004]; respondent's letter of 14 April 2006, paragraph 2).

The Board considers that O4 does not give any hint inducing a skilled person to change the arrangements of Figures 1-4 according to the teaching of claim 1 of the granted patent. The skilled person would at most infer from Figure 5 that an array of fluidic amplifiers, as shown in Figure 1, can be arranged spatially offset from each other. This acknowledgment, however, does not lead to the construct of claim 1 of the granted patent.

In the oral proceedings the joint appellants based their argumentation mainly on Figure 7 of O4 which discloses a monopolar arrangement.

As shown in Figure 7, a fluidic amplifier 1 is placed between a non-radiating resonator 11 and an acoustic adapter in the form of a horn 6. The fluidic amplifier has a dumping port 42 connected to the resonator and output port 41 connected to the horn. O4 does not mention that this fluidic amplifier has a face plate and a back plate. Neither does O4 describe the input port and the fluid supply port of the fluidic amplifier. Assuming that these ports are those shown in Figure 7 without a reference number, they are arranged on a side of the fluidic amplifier.

O4 also discloses in Figure 8 a further monopolar arrangement which, however, is not more relevant than that of Figure 7.

The appellant submitted that the skilled person would want to modify the structure of Figure 7 of O4 to provide a fluidic amplifier having a planar configuration. With this aim, the positioning of the various ports would present the skilled person with a one-way street scenario. The input and output ports could not be located in the side, as is the case in O4, but instead, would have to be located in the front face. The dump port would logically have to be provided in the rear face. The supply port could either be provided in the front or the rear face; the mere choice of either of these options could not be considered as involving any inventive activity.

However, O4 contains no incentive for the skilled person to consider modifying the geometry of the fluidic amplifier unit. As indicated in the description of the contested patent (see, e.g., paragraphs [0009], [0014] and [0022]), a planar configuration is advantageous in that it allows the individual fluidic elements to be combined in an extensive, flat and thin arrangement (referred to in the description, paragraph [0009], as "*sound absorbing wallpaper*") which enables a spatially distributed sound cancellation to be achieved. This reason for adopting a planar configuration is not in any way suggested in O4 and does not appear to be obvious without the use of hindsight.

In summary, the skilled person would not arrive at the construct of claim 1 of the granted patent starting from the disclosure of O4 even taking his technical knowledge into account, unless hindsight is used.

5.3.2 With regard to the combinations of O3 with O1 and of O1 with O2, they are not convincing in view of the fact that O1 and O2 are not relevant, O1 concerning fluidic acoustic signal amplification and O2 relating to fluidic noise control with an electric input (see above).

5.4 The argumentation mentioned above with regard to claim 1 of the granted patent also applies to the independent claim 9 of the granted patent, which defines a method for attenuating sound waves using the construct of claim 1.

5.5 In conclusion, the ground for opposition under Article 100(a) EPC 1973 in connection with Article 56 EPC 1973 does not prejudice the maintenance of the patent as granted.

Thus, the respondent's main request is allowable.

6. **Respondent's auxiliary requests**

The respondent's auxiliary requests need not be considered because the main request is allowable.

7. Joint appellants' request for remittal of the case to the opposition division

The Board has found the respondent's main request, which concerns the granted patent, to be allowable. The Board arrived at this finding on the basis of the same evidence, namely documents 01 to 04, as that used by the opposition division in coming to the same conclusion. The Board therefore sees no reason which could justify the remittal of the case to the opposition division for further prosecution.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

R. Schumacher

B. Schachenmann