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**Datasheet for the decision
of 7 October 2011**

Case Number: T 0848/09 - 3.5.03

Application Number: 02080562.8

Publication Number: 1326153

IPC: G05D 1/00

Language of the proceedings: EN

Title of invention:

Apparatus and method for navigation of an aircraft

Patentee:

The Boeing Company

Opponent:

AIRBUS SAS/AIRBUS OPERATIONS/AIRBUS OPERATIONS Ltd/AIRBUS
OPERATIONS GmbH/AIRBUS OPERATIONS S.L.

Headword:

Aircraft navigation apparatus/BOEING

Relevant legal provisions:

EPC Art. 56

RPBA Art. 12(4)

Relevant legal provisions (EPC 1973):

-

Keyword:

"Admissibility (main request) - yes"

"Inventive step (main request) - no"

"Admissibility (auxiliary requests) - no"

Decisions cited:

G 0009/91, T 0240/04, T 0144/09, T 0379/09

Catchword:

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Case Number: T 0848/09 - 3.5.03

D E C I S I O N
of the Technical Board of Appeal 3.5.03
of 7 October 2011

Appellant:
(Patent Proprietor)

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Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted 3 February 2009
revoking European patent No. 1326153 pursuant
to Article 101(2) EPC.**

Composition of the Board:

Chair: M.-B. Tardo-Dino
Members: T. Snell
B. Noll

Summary of Facts and Submissions

I. This appeal was lodged by the proprietor against the decision of the opposition division revoking European patent No. EP 1326153 on the ground that the subject-matter of claim 1 of the granted patent lacked an inventive step having regard to the disclosure of the following document in combination with common general knowledge (Article 100(a) in combination with Articles 52(1) and 56 EPC):

D3: US-B-6278945

II. In the statement of grounds, the appellant requested that the impugned decision be set aside and the patent be "restored". Additionally, claims of first to third auxiliary requests were filed with the statement of grounds.

In a response to the notice of appeal, the opponent (respondent) requested that the decision of the opposition division be confirmed and the patent be revoked.

Both parties conditionally requested oral proceedings.

III. In a communication accompanying a summons to attend oral proceedings, the board drew attention to the matters to be discussed. *Inter alia*, the board noted that it would be necessary to discuss inventive step starting out from document D3. The board also noted that as none of the auxiliary requests had been presented before the opposition division, although this appears to have been possible, it was at the discretion

of the board whether to admit these requests pursuant to Article 12(4) RPBA (cf. eg T 240/04, point 16 of the reasons).

IV. In a response dated 17 August 2011, the appellant filed claims of amended main and first to third auxiliary requests together with arguments.

V. Oral proceedings took place on 7 October 2011.

The appellant requested that the decision under appeal be set aside and the patent maintained in accordance with the main request or, in the alternative, in amended form on the basis of the first or second auxiliary requests, all filed with letter dated 17 August 2011. The third auxiliary request, ie maintenance of the patent as granted, was withdrawn.

The respondent requested that the appeal be dismissed.

At the conclusion of the oral proceedings, after due deliberation, the board gave its decision.

VI. Claim 1 of the **main request** reads as follows:

"An apparatus for navigation of an aircraft, the apparatus comprising:
a primary navigation system (118) having a global positioning system (102) capable of providing signals indicative of a position of the aircraft and a plurality of micro-electromechanical sensors (104) capable of providing signals indicative of inertial motion of the aircraft;

said plurality of micro-electromechanical sensors of the primary navigation system (118) comprise a micro-electromechanical rate sensor and a micro-electromechanical accelerometer, wherein the signals provided by the global positioning system and the micro-electromechanical sensors are to be utilized for navigating the aircraft; and characterized by: a secondary navigation system (110) capable of performing inertial referencing of the aircraft, and having a laser gyroscope system, (112) comprising no more than three ring laser gyroscopes producing navigation signals utilized in the event the primary navigation system malfunctions."

Claim 1 of the **first auxiliary request** is the same as claim 1 of the main request except that the characterising part reads as follows:

"a secondary navigation system (110) capable of performing inertial referencing of the aircraft, and having a laser gyroscope system (112) producing navigation signals utilized in the event the primary navigation system malfunctions, and wherein the micro-electromechanical rate sensors and micro-electromechanical accelerometers are distributed in four clusters located on the wing main spar."

Claim 1 of the **second auxiliary request** is the same as claim 1 of the first auxiliary request except that the following wording is added to the end of the claim:

"where the structural bending motion of the aircraft is minimized".

Reasons for the decision

1. *Admissibility of the main request*

In accordance with Article 12(4) of the Rules of Procedure of the Boards of Appeal (RPBA), the board has the discretion "to hold inadmissible facts, evidence or requests which could have been presented or were not admitted in the first instance proceedings".

The respondent argued that the main request should not be admitted as it was not submitted during opposition proceedings, despite the fact that the patent proprietor had been asked by the chairman of the opposition division whether it wished to file "an auxiliary request" (cf. point 18 of the minutes of oral proceedings). The respondent also argued that appeal proceedings concerned a judicial procedure whose primary purpose was to determine the correctness of the decision taken by the opposition division. The respondent referred to decisions T 379/09, T 144/09 and T 240/04 to provide support for its view.

The board concurs with the respondent that the primary purpose of the appeal procedure is to check the correctness of the decision of the department of first instance. It is also established case law that the parties should not in general be able to change the factual and legal framework of the case during the appeal phase; however, this does not mean their procedural situation becomes frozen following the decision from the department of first instance. In accordance with Article 12(4) RPBA, amendments are possible, provided that these amendments are justified

by the normal development of the proceedings. Amendments may for instance be justifiable having regard to the principle of procedural economy (which is not the main justification here, but at least there is no conflict since no delay to the proceedings has ensued), or, as is the case here, be a normal reaction of a party given the circumstances of the case.

In the cases cited by the respondent where the new requests were not admitted under Article 12(4) RPBA, the circumstances were different, namely:

- In T 379/09, the patent proprietor filed the new request aimed at overcoming an objection raised by the opposition division only one month before the oral proceedings before the board of the appeal although the nature of the objection had been set out in the summons to oral proceedings issued by the opposition division. Furthermore, admitting the request would have caused a considerable delay of the procedure.
- In T 144/09 (cf. point 1.14), the proprietor had made a "considered and deliberate choice" not to file an amended request, despite being given the opportunity to do so after the objection had been explained.
- In T 240/04 (cf. point 16), the new request introduced subject-matter which had not been considered by the first instance and, above all, diverged from what had been discussed before; instead of convergence there was a jump to another invention.

By contrast, in the present case the board considers the filing of the present main request to be a legitimate and normal reaction to the decision to revoke the patent, because the amendment concerns the addition of a feature of a dependent claim which

further limits the subject-matter distinguishing the invention with respect to the disclosure of document D3. As the added feature was previously in a dependent claim, it can be assumed that the claimed subject-matter has been searched. Moreover, the request was filed at the earliest possible stage of the appeal proceedings, namely with the statement of grounds. The filing of this request therefore did not give rise to any procedural complications preventing a discussion of the request at the oral proceedings. Even if, theoretically, the patent proprietor might have been able to file this request at the end of the oral proceedings before the opposition division, the board sees a difference with the other cited cases above, in particular with T 144/09, since it does not appear that the patent proprietor made a "considered and deliberate choice" not to file the request. Rather, the reasons for the revocation of the patent were not so explicitly known as in case T 144/09 and plausibly the formulation of a suitable new request overcoming the objection was not immediately evident. In such circumstances it would be unreasonable to penalise the non-filing of an auxiliary request at the end of oral proceedings by later invoking Article 12(4) RPBA in appeal proceedings.

The board therefore decided to exercise its discretion to admit the main request.

2. *Inventive step - main request - claim 1*

2.1 The present patent relates to aircraft navigation systems. Paragraphs [0004]-[0006] of the description of the patent give an overview of some commonly known

systems, which the appellant did not deny belonged to the common general knowledge of the skilled person. As stated in the description of the patent, most modern commercial aircraft are equipped with traditional (ie non-fault-tolerant), or less commonly, fault-tolerant Air Data Inertial Reference Units (ADIRU) to perform stand-alone inertial navigation. Generally, aircraft have more than one, typically three, traditional ADIRUs operating in parallel in a redundant arrangement, whereby each traditional ADIRU has three ring laser gyroscopes. A configuration of three traditional ADIRUs therefore requires nine ring laser gyroscopes. Alternatively, a fault-tolerant ADIRU is also known which comprises six ring laser gyroscopes. An aircraft equipped with a fault-tolerant ADIRU carries a back-up unit (called a "Secondary Attitude Air data reference Unit", SAARU) for the rare event that the ADIRU malfunctions. As stated in column 2, lines 31-33, **"The components of the SAARU are intentionally dissimilar to the ADIRU to preclude common failures in both units. That is, the SAARU generally will not include ring laser gyroscopes if the ADIRU includes ring laser gyroscopes"** (board's emphasis).

- 2.2 It was common ground between the parties at the oral proceedings that document D3 represents the closest prior art document on file.

Document D3 concerns an apparatus for navigation of an aircraft, examples being given of "strike weapons [eg guided missiles], unmanned airborne vehicle[s] and avionics platforms" (cf. col. 4, lines 21-26). D3 describes a fault-tolerant navigation system comprising an integrated GPS/IMU ("inertial measurement unit")

system in which both GPS signals and inertial signals are combined using a Kalman filter to optimize the accuracy of the navigation system output. The IMU may comprise a plurality of micro-electromechanical sensors including [angular] rate sensors ("Silicon Micromechanical Gyros") and accelerometers ("Silicon Micromechanical Accelerometers") (cf. col. 2, lines 55 and 59 and col. 10, lines 14-15). The integrated GPS/IMU system described in D3 is regarded as a "primary navigation system" within the meaning of claim 1 of the main request.

2.3 It was not disputed by the appellant that the subject-matter of claim 1 differs from disclosure of document D3 in the feature:

"a secondary navigation system capable of performing inertial referencing of the aircraft, ... said secondary navigation system [having] a laser gyroscope system ... producing navigation signals utilized in the event the primary navigation system malfunctions".

2.4 This feature provides the technical effect of having a back-up system in case the primary navigation system should fail totally. The problem to be solved is therefore regarded by the board as being how to safeguard against a total failure of the primary system.

2.5 The appellant argued in the statement of grounds that the problem was how to safeguard against a malfunction of the primary system and that D3 already provided a solution to this problem as the navigation system of D3 can be reconfigured to use either the GPS signals or the inertial reference signals from the IMU. The board

however considers the appellant's formulation of the problem to be too general since the technical effects of the secondary system are only relevant for specific malfunctions from which recovery is not possible in D3, ie total failure of the primary system, caused by eg a malfunction of the Kalman filter and its associated processing, or a loss of power to the primary system.

2.6 Although this problem is not addressed in D3, in the board's view it is obvious that the skilled person would need to solve this problem since total failure of the primary navigation system of, for example, a strike weapon could have catastrophic consequences. In order to solve the problem of total failure, it would, in the board's view, be obvious to provide a back-up system in the form of a secondary navigation system. This follows both from the skilled person's common general knowledge of aircraft navigation systems as set out in the description of the present patent as well as from the general engineering principle of providing redundancy for critical elements of a system. A further principle known to the skilled person (see above) is that the redundant navigation system should use different components to the primary system. Since the primary system of D3 uses fibre optic gyroscopes, it follows that ring laser gyroscopes would be an obvious alternative (cf. D3, col. 2, lines 52-54).

2.7 The appellant argued that ring laser gyroscopes are expensive and, in the context of document D3, would be rejected on cost grounds as one of the aims of D3 is to provide a low cost solution. The board is not convinced by this argument, since cost is merely an arbitrary design constraint which can be dispensed with as

desired. In the board's view, it is equally conceivable that the skilled person starting out from D3 would wish to give aspects such as reliability and precision a higher priority than cost.

2.8 In providing a secondary system incorporating ring laser gyroscopes, it would be a natural choice to consider a "traditional" ADIRU, which, as follows from the introductory part of the description, is a well-known stand-alone navigation system using three ring laser gyroscopes. The appellant argued that in the prior art, ADIRUs were only either provided in triplicate (ie nine gyroscopes), or as an integrated fail-safe unit comprising six gyroscopes. However, in the board's view it would readily occur to the skilled person to use only a single stand-alone traditional ADIRU for the secondary system, based on the same principle of using a non-fault-tolerant secondary navigation system as described in paragraph [0006] of the description of the patent in suit in respect of a SAARU. The skilled person would therefore not require inventive skill to include a secondary navigation system comprising not more than three ring laser gyroscopes.

It follows that the subject-matter of claim 1 of the main request does not involve an inventive step (Articles 52(1) and 56 EPC).

3. *Admissibility of the first and second auxiliary requests*

3.1 As already mentioned in connection with the main request, the board has the discretion not to admit

requests which could have been filed in the first instance proceedings (cf. Article 12(4) RPBA).

3.2 Whereas claim 1 of the main request was amended with respect to the granted version to add a further limiting feature relating to the secondary navigation system (ie the secondary system comprises not more than three ring laser gyroscopes), this feature has been omitted from claim 1 of the first and second auxiliary requests and instead a different feature added, namely that "the micro-electromechanical rate sensors and micro-electromechanical accelerometers are distributed in four clusters located on the wing main spar". This feature is not found in any claim of the granted patent but has been taken from the description.

3.3 This new feature concerns an entirely different technical problem to that previously discussed in respect of the main request. The development of the appellant's requests is therefore "divergent". Moreover, this feature probably has not been searched. Thus, if the board were to admit this request, it would not be in a position to decide, but would be compelled to remit the case to the department of first instance. This would not only put the opponent at a disadvantage but would also run counter to the principle of procedural economy (cf. T 240/04, point 16.3 of the reasons, not published). If the appellant had wished to change completely the scope of the invention in this way, this should have been done during the opposition procedure, since the main purpose of opposition appeal proceedings is to give the losing party the opportunity to challenge the impugned decision (cf. G 9/91, OJ EPO

1993, 408, point 18 of the reasons) rather than to consider issues not put before the opposition division.

3.4 The appellant argued that it was only at the oral proceedings before the opposition division that the danger to maintenance of the patent had been appreciated due to the strength of the opponent's oral arguments and, by then, it was too late to react by filing new requests, especially as his client was based in the USA. Moreover, the appellant did not wish the case to be remitted. However, in the board's view it is the normal responsibility of a party to anticipate that its main request may be refused at oral proceedings and to file any auxiliary requests in good time. Moreover, the requirements of convergence and that there be no delay to the proceedings, ie matters which contributed to the main request being deemed admissible, are not met in the case of these two auxiliary requests. It is also not relevant that the appellant did not wish to have the case remitted because, for the reasons given above, this does not alter the fact that the board would not have been in a position to decide on the auxiliary requests.

For these reasons, the board decided not to admit the first and second auxiliary requests.

4. *Conclusion*

As claim 1 of the appellant's main request is not allowable and the first and second auxiliary requests not admissible, it follows that there is no allowable request of the appellant on file. Consequently, the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar:

The Chairman:

G. Rauh

M.-B. Tardo-Dino