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**Datasheet for the decision  
of 07 April 2011**

**Case Number:** T 1202/07 - 3.5.03

**Application Number:** 95203000.5

**Publication Number:** 0743584

**IPC:** G05D 1/06

**Language of the proceedings:** EN

**Title of invention:**

Aircraft vertical position control system

**Patentee:**

The Boeing Company

**Opponent:**

Airbus SAS

**Headword:**

Aircraft control system/BOEING

**Relevant legal provisions:**

EPC Art. 123(3)

**Relevant legal provisions (EPC 1973):**

-

**Keyword:**

"Extension of protection (all requests) - yes"

**Decisions cited:**

G 0001/93, T 1018/02, T 0190/99, T 0749/03, T 0108/91,  
T 0438/98

**Catchword:**

-



Case Number: T 1202/07 - 3.5.03

**DECISION**  
of the Technical Board of Appeal 3.5.03  
of 07 April 2011

**Appellant:** Airbus SAS  
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**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
14 May 2007 concerning maintenance of European  
patent No. 0743584 in amended form.

**Composition of the Board:**

**Chairman:** R. Menapace  
**Members:** T. Snell  
F. van der Voort

## Summary of Facts and Submissions

- I. This appeal is against the interlocutory decision of the opposition division which found that European patent No. 0743584 in amended form, in accordance with the claims of a second auxiliary request, met the requirements of the EPC.
- II. The opposition had been filed against the patent as a whole on the grounds of Articles 100(a) and (b) EPC. In the course of the opposition proceedings, the opposition division introduced of its own motion a new ground of opposition under Article 100(c) EPC.
- III. In the impugned decision, the opposition division held that the following wording of claims 1 and 7 of the proprietor's (now respondent) main request (ie the claims as granted) represented "unallowable added subject-matter" (ie, implicitly, that the ground of opposition under Article 100(c) EPC prejudiced the maintenance of the patent): "the command processor includes a filter having a damping ratio which is variable dependent on a feedback component".

The opposition division however held that the claims of a second auxiliary request (corresponding to the respondent's present main request) met the requirements of the EPC, including that of Article 123(3) EPC. The wording of the above phrase had been amended to read "the command processor includes a filter having a damping ratio which is variable, **the filter being** dependent on a feedback component" (board's emphasis).

IV. The opponent (appellant) lodged an appeal against the decision. The appellant requested that the decision of the opposition division be set aside and the patent revoked in its entirety.

The appellant also filed a conditional request for oral proceedings.

In the statement of grounds of appeal, the appellant submitted, *inter alia*, that claims 1 and 7 of the request held to be allowable by the opposition division did not comply with Article 123(3) EPC.

V. In a response to the notice of appeal, the patent proprietor (respondent) requested that the patent be maintained in the form upheld by the opposition division in its interlocutory decision. Claims of first to third auxiliary requests were also submitted.

Oral proceedings were conditionally requested.

VI. In a communication accompanying a summons to attend oral proceedings, the board, *inter alia*, noted the following:

".... it will be necessary [at the oral proceedings] to consider the meaning of the phrase of granted claims 1 and 7 "a filter having a damping ratio which is variable dependent on a feedback component ..." and whether this phrase implies a limitation of the claims to include a damping ratio which is variable dependent on a feedback component, or whether, as argued by the respondent, the phrase should, in the light of

the description and drawings, be interpreted in the sense that the damping ratio is variable and the filter is dependent on a feedback component",

and

"If the board were to conclude that the phrase should be construed in the sense that the damping ratio is dependent on a feedback ratio, as regards Article 123(3) EPC, it will have to be considered whether the respondent is in an inescapable Article 123(2) and (3) EPC trap (cf. G 1/93)."

VII. With a response received on 7 March 2011, the respondent filed claims of first to eighth auxiliary requests to replace the auxiliary requests on file. The respondent also requested that the board consider alternative wordings of the claims of various of the auxiliary requests. The respondent argued, *inter alia*, that the requirement of Article 123(3) EPC was complied with.

VIII. Oral proceedings took place on 07 April 2011.

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

The respondent requested that the appeal be dismissed or, alternatively, that the decision be set aside and that it be found that the patent on the basis of the claims of any one of the auxiliary requests 1 to 8 in all the various versions filed on 7 March 2011 meets the requirements of the EPC.

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

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

"A vertical position control system which receives input signals including selected altitude ( $h_s$ ), selected vertical speed ( $\dot{h}_s$ ), current altitude ( $h$ ), and current vertical speed ( $\dot{h}$ ), the control system including

(a) a command processor (24) that computes a command trajectory in terms of a commanded altitude ( $h_c$ ) and a commanded vertical speed ( $\dot{h}_c$ );

(b) a first combining unit (26) operatively connected to an output of said processor and for combining current altitude ( $h$ ) with commanded altitude ( $h_c$ ) to produce a differential commanded altitude signal ( $\Delta h_c$ );

(c) a first multiplier (29) operatively connected to an output of said first combining unit for converting the differential commanded altitude signal ( $\Delta h_c$ ) into a proportional pitch attitude command ( $\Delta \theta_c$ );

(d) a smoothing integrator (62) operatively connected to an output of said first multiplier and having an output representing pitch attitude command ( $\theta_c$ ),

(e) a second combining unit (68) operatively connected to a combination of the output of said integrator and the output of said first multiplier for combining the pitch attitude command ( $\theta_c$ ) and a current pitch attitude ( $\theta$ ) to form a pitch attitude error ( $E_\theta$ ), and

(f) a second multiplier (72) operatively connected to the output of said second combining unit for filtering the pitch attitude error,

characterized in that the command processor includes a filter having a damping ratio which is variable, the filter being dependent on a feedback component resulting from the intermediate commanded vertical speed ( $\dot{h}'_c$ ) and the intermediate commanded vertical altitude ( $h'_c$ ) wherein the intermediate commanded vertical speed ( $\dot{h}'_c$ ) is multiplied by a factor including the damping ratio which may be set to any desirable constant or may be a variable calculated at the time of engagement or other convenient time to adjust the response of the control system in relation to a respective flight maneuver."

X. Independent claim 7 of the **main request** reads as follows:

"A method for creating an aircraft elevator command signal using input signals including selected altitude ( $h_s$ ), selected vertical speed ( $\dot{h}_s$ ), current altitude ( $h$ ), and current vertical speed ( $\dot{h}$ ), the method comprising:

(a) computing a command trajectory by a command processor (24) in terms of a commanded altitude ( $h_c$ ) and a commanded vertical speed ( $\dot{h}_c$ );

(b) combining in a first combining unit (26), which is operatively connected to an output of said processor, the current altitude ( $h$ ) with the commanded altitude ( $h_c$ ) to produce a differential commanded altitude signal ( $\Delta h_c$ );

(c) applying an altitude gain ( $K_h$ ) to the differential commanded altitude signal ( $\Delta h_c$ ) to form a proportional pitch attitude command ( $\Delta\theta_c$ ), by a first multiplier (29) which is operatively connected to an output of said first combining unit;

(d) integrating the output of the first multiplier by a smoothing integrator (62) having an output representing a pitch attitude command ( $\theta_c$ );

(e) combining the output of said integrator and the output of said first multiplier for combining the pitch attitude command ( $\theta_c$ ) and a current pitch attitude ( $\theta$ ) to form a pitch attitude error ( $E_\theta$ ) by a second combining unit (68); and

(f) multiplying the output of said second combining unit for filtering the pitch attitude error by a second multiplier (72);

characterized in that the command processor includes a filter having a damping ratio which is variable, the filter being dependent on a feedback component resulting from the intermediate commanded vertical speed ( $\dot{h}'_c$ ) and the intermediate commanded vertical altitude ( $h'_c$ ) wherein the intermediate commanded vertical speed ( $\dot{h}'_c$ ) is multiplied by a factor including the damping ratio which may be set to any desirable constant or may be a variable calculated at the time of engagement or other convenient time to adjust the response of the control system in relation to a respective flight maneuver."

XI. For the sake of conciseness, the wording of claims 1 and 7 of each of the auxiliary requests is not reproduced in full. Relevant to the board's decision is the fact that claim 1 of the **first, second, third,**



**seventh** and **eighth auxiliary requests** (including the alternative versions requested in the letter dated 7 March 2011), as well as claim 7 of the **first, second and third auxiliary requests**, all include the following wording (NB: the seventh and eighth auxiliary requests comprise only a single independent claim):

"the command processor includes a filter having a damping ratio which is variable, the filter being dependent on a feedback component ...",

and that claims 1 and 7 of the **fourth, fifth and sixth auxiliary requests** (including the alternative versions requested in the letter dated 7 March 2011) all include the following wording:

"the damping ratio ( $\zeta$ ) of the filter being variable, the filter being dependent on a feedback component ...".

## **Reasons for the Decision**

### 1. *Technical background*

The invention relates generally to flight control systems for aircraft, and, more particularly, to a vertical position control system (claim 1) and a corresponding method (claim 7). The system in accordance with claim 1 includes a command processor that computes a command trajectory [expressed] in terms of a commanded altitude and a commanded vertical speed. This command processor, which includes a filter, is

further defined in the characterising part of claim 1 and this definition is the central issue in this case.

2. *Article 123(3) EPC (claim 1, main request)*

2.1 The present case concerns the conflict between Articles 123(2) and (3) EPC which was considered in decision G 1/93 of the Enlarged Board of Appeal (OJ EPO 1994, 541). In G 1/93 (cf. point 1 of the Order) it is stated that "If a European patent as granted contains subject-matter which extends beyond the content of the application as filed within the meaning of Article 123(2) EPC and which also limits the scope of protection conferred by the patent, such patent cannot be maintained in opposition proceedings unamended, because the ground for opposition under Article 100(c) EPC prejudices the maintenance of the patent. Nor can it be amended by deleting such limiting subject-matter from the claims, because such amendment would extend the protection conferred, which is prohibited by Article 123(3) EPC. Such a patent can, therefore, only be maintained if there is a basis in the application as filed for replacing such subject-matter without violating Article 123(3) EPC".

2.2 In the present case the wording of claim 1 of the granted patent "the command processor includes a filter having a damping ratio which is variable dependent on a feedback component" (which feature the opposition division held to infringe Article 123(2) EPC) was amended to "the command processor includes a filter having a damping ratio which is variable, **the filter being** dependent on a feedback component" (board's emphasis). It has to be decided whether this amendment

extends the scope of protection, since, in accordance with Article 123(3) EPC, "The European patent may not be amended in such a way as to extend the protection it confers".

2.3 Considering the wording of claim 1 from a linguistic point of view, it is clear to the board that the phrase "dependent on a feedback component" in the granted version of claim 1 is associated with the word "variable" which immediately precedes it. As it is not disputed that the term "variable" refers to the damping ratio (indeed, this aspect is retained in the amended version), it follows that claim 1 as granted requires, in a linguistic sense, a damping ratio that is variable dependent on a feedback component.

2.4 It is not in dispute that that the description provides no support for a damping ratio that is variable dependent on a feedback component. The extent of protection conferred by a claim feature not consistent with the description was considered in decision T 1018/02 (not published). In accordance with decision T 1018/02 (cf. point 3.8 of the Reasons for the Decision), "... 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. This also applies if the feature has not been initially disclosed in the form appearing in the claim. Otherwise third parties could not rely on what a claim actually states (cf. Article 69(1) EPC: The terms of the claims determine the extent of protection whereas the description is only used to interpret the claims) and Article 123(2) EPC would

become meaningless in respect of amendments to the claims".

- 2.5 In order to determine whether the claim feature in itself imparts a clear, credible technical teaching, it is necessary, in the board's view, to examine whether (a) the feature as claimed is in itself meaningful and plausible from a technical point of view, and (b) there is, *prima facie*, any inherent incompatibility with the remaining features of the claim.
- 2.6 The technical plausibility of a damping ratio which is variable dependent on a feedback component is in the board's view not in doubt. The respondent argued at the oral proceedings that such a measure would be "unusual", leading the skilled person to conclude that this was not the intended meaning. However, in the board's view, whether or not a feature is in common use cannot in itself be a factor leading the skilled person to doubt its meaning.
- 2.7 Further, in the board's view, there is in the present case no inherent incompatibility with the remaining features of claim 1. Although claim 1 as granted later stipulates that the damping ratio "may be set to any desirable constant or may be a variable calculated at the time of engagement or other convenient time", it is perfectly possible, in the board's view, that the setting of the damping factor to a desirable constant (eg a choice of one value amongst a set of constants) or to a calculated variable can be made dependent on the feedback component, eg such that a different constant/variable is used during different phases of the maneuver. The respondent argued that the correct

interpretation of the claim was that once the damping ratio is set to a desirable constant or a calculated variable, it remains fixed at the same value throughout the maneuver, this being entirely incompatible with a dependency of the damping ratio on a feedback component. However, the board observes that claim 1 does not require that the damping ratio remain fixed throughout a maneuver. On the contrary, it provides that the damping ratio may be "a variable calculated at the time of engagement or any other convenient time" (board's underlining). Claim 1 therefore embraces changing the value during a maneuver.

2.8 The remaining arguments of the respondent put forward at the oral proceedings can be summarised as follows:

(i) Claim 1 is ambiguous, in that it has two possible meanings. The first meaning is that the damping ratio is dependent on a feedback component, the second being that the filter itself is dependent on the feedback component. The skilled person has to read the claim with a mind desirous of understanding. He would therefore appreciate that there is an inconsistency between a damping ratio which is variable dependent on a feedback component and the later feature that the damping ratio may be set to a constant. In resolving this inconsistency, the skilled person would come to the only true interpretation of the granted claim which is that it is not the damping ratio which is dependent on a feedback component, but the filter itself. Since the amendment relates to taking only one of the two possible meanings of granted claim 1, the scope of protection has not been extended.

(ii) In order that the command processor produce output values of commanded altitude and commanded vertical speed, the skilled person would know that the feedback component must be fed back to the filter input rather than be used to control the damping ratio.

2.9 Re (i): As explained above, the board disagrees that the claim is either linguistically or technically ambiguous in the sense that the feature "a filter having a damping ratio which is variable dependent on a feedback component .." has more than one meaning.

Re (ii): Claim 1 does not exclude that the feedback component is fed back to the filter input as well as being used to control the value of the damping ratio.

The board therefore finds these arguments of the respondent unconvincing.

2.10 The board concludes that claim 1 as granted was limited in the sense that the damping ratio was variable dependent on a feedback component. As claim 1 of the main request no longer includes such a limitation, the board concludes that protection conferred by the patent has been extended, contrary to Article 123(3) EPC.

2.11 In the impugned decision, the opposition division relied on decisions T 190/99 and T 749/03 (neither published) as well as T 108/91 (OJ 1994, 228) and T 438/98 (not published), all of which had been cited by the patent proprietor (now respondent) during opposition proceedings. The respondent referred again to these decisions in the written phase of these appeal proceedings. In the light of these decisions, the

opposition division concurred with the view of the proprietor that, having regard to Article 123(3) EPC, it was "possible to amend a granted claim to replace an inaccurate technical statement, which is evidently inconsistent with the totality of the disclosure of the patent, with an accurate statement of the technical features" [board's note: this corresponds to the headnote of T 108/91]. The opposition division stated further that "The only sensible interpretation of claims 1 and 7 [as granted] in view of the disclosure in the patent specification implies that it is the filter which is dependent on the feedback component: with such a reading, the claims are not only clear and consistent in themselves but also clear and consistent with the totality of the disclosure of the patent". It concluded that Article 123(3) EPC was not infringed by claim 1 of the present main request.

2.12 As already stated, the board agrees that in the present case "a damping ratio which is variable dependent on a feedback component" has no basis in the description. However, the board has explained above (cf. in particular points 2.4 - 2.7) why it is not possible to use the description to give another meaning to this feature than the one deriving from the wording used in the claim.

Moreover, the board observes that T 190/99 (cf. point 2.3.4 of the Reasons for the Decision) adopts the standpoint of the earlier decision T 108/91. With regard to T 108/91, it is noted that the feature in question, the deletion of which, in that board's view, did not contravene Article 123(3) EPC, was considered to run against the implicit technical objective of the

invention (cf. point 2.2 of the Reasons for the Decision). Without going into whether this is still a valid approach in the light of the later-published decision G 1/93, the board notes that this aspect does not apply to the present case, since varying the value of the damping ratio dependent on a feedback component does not *prima facie* run counter to the aim of improving the flight response of the aircraft. T 749/03 also concerns a different situation to the present case in that, in the case at issue in T 749/03, certain features could only be made sense of by reference to the description and drawings (cf. point 2.2.9 of the Reasons for the Decision). Finally, in decision T 438/98 the amendment concerned the correction of an obvious clerical error (cf. point 3.1.3 of the Reasons for the Decision). Therefore the board disagrees with the view of the opposition division and the appellant as to the relevance of these decisions to the present case.

3. *Article 123(3) EPC (claim 7, main request)*

The above considerations apply, *mutatis mutandis*, to method claim 7 of the main request. The respondent argued that, having regard to the method category of claim 7, it made no sense to vary a damping ratio dependent on a feedback component and subsequently set the damping ratio to a constant. The board disagrees, since it would be possible and technically credible within the terms of claim 7 to use feedback during one part of a maneuver and a constant value in a subsequent part. Hence, the board sees no reason to judge the method claim differently to the system claim. Moreover, the characterising part of claim 7 is in any case



regarded by the board as being a definition of features expressed in terms of functions carried out by the structural elements rather than relating to a series of steps to be carried out in sequence.

The board concludes that claim 7 does not comply with Article 123(3) either.

4. *First to eighth auxiliary requests*

The independent claims of each of the auxiliary requests, including the various alternative versions proposed in the letter dated 7 March 2011, suffer from the same objection under Article 123(3) EPC as claims 1 and 7 of the main request. This was not disputed by the respondent.

The board concludes that none of the auxiliary requests is allowable either.

5. *Conclusion*

As there is no allowable request, it follows that the patent must be revoked.

**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:

G. Rauh

R. Menapace