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**Datasheet for the decision
of 24 January 2008**

Case Number: T 1455/06 - 3.2.01

Application Number: 94929348.4

Publication Number: 0722404

IPC: B64D 11/00

Language of the proceedings: EN

Title of invention:

Optimal airplane passenger seating configurations and methods therefor

Patentee:

The Boeing Company

Opponent:

Airbus Deutschland GmbH

Headword:

-

Relevant legal provisions:

EPC Art. 123(2)

RPBA Art. 13(3)

Relevant legal provisions (EPC 1973):

EPC Art. 54, 84

Keyword:

"Novelty (main request, no)"

"Clarity (first and fifth auxiliary requests, no)"

"Added subject-matter (first, second, third and fourth auxiliary requests, yes)"

Decisions cited:

G 0009/92, G 0001/03

Catchword:

-



Case Number: T 1455/06 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 24 January 2008

Appellant: The Boeing Company
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
6 July 2006 concerning maintenance of European
patent No. 0722404 in amended form.

Composition of the Board:

Chairman: S. Crane
Members: J. Osborne
S. Hoffmann

Summary of Facts and Submissions

- I. The patent proprietor's appeal is directed against the decision posted 6 July 2006 according to which the opposition division found that, account being taken of the amendments made by the patent proprietor during the opposition proceedings, the patent and the invention to which it relates meet the requirements of the EPC. In particular, the opposition division found that claims 1 to 5 as granted satisfied the requirements of the EPC but that *inter alia* the subject-matter of claim 6 as granted was not new.
- II. The decision was taken in the light of *inter alia* the following state of the art:
- D2: Irving Stone, "Boeing shifts to Low-Wing 747 Design", Aviation Week and Space Technology, 21 February 1966, 37-39.
- III. With a communication dated 27 September 2007 the board summoned the parties to oral proceedings. With a letter of 23 December 2007 the appellant amended its requests to include *inter alia* for the first time a request comprising claims 1 to 5 as granted and additional dependent claims 6 to 13.
- IV. At oral proceedings held on 24 January 2008 the appellant requested that the decision under appeal be set aside and the patent maintained on the basis of claims 1 to 11 as granted (main request) or in the alternative on the basis of the first to sixth auxiliary requests filed with the letter of

23 December 2007 or the seventh auxiliary request filed during the oral proceedings.

The respondent requested that the appeal be dismissed.

- V. Claims 1 to 5 as granted, which were found allowable by the opposition division, are included in all requests. Claims 1 to 3 are directed towards a process for optimising passenger seating configurations in an aircraft and claims 4 and 5 are directed towards a process for maximising passenger comfort in an aircraft having a fixed number of seats and aisles per row.

Claim 6 according to the main request reads:

"In an airplane of fixed dimensions, having standard seats, two aisles and eight abreast seating the seating configuration comprising a two-seat unit and two three-seat units."

Claim 6 according to the first auxiliary request reads:

"A process for increasing the chance that a passenger seated within an airplane having fixed dimensions operating at typical load factors will be seated next to an empty seat, the airplane having a passenger compartment bounded by side walls and in which a plurality of standard passenger seats are arranged in rows, the airplane further having two aisles and eight abreast seating, said process comprising for each row:
a) installing a two-seat unit within said airplane between one of said side walls and a first aisle closest to said side wall,
b) installing a three-seat unit within said airplane

between said first aisle and the second aisle, and
c) installing another three-seat unit within said
airplane between said second aisle and the other side
wall of said airplane,
said process further comprising seating passengers
first in the two seats in each row that are closest to
each of said side walls and the three seats in each row
that are closest to said aisles and that are adjacent
to an empty seat, until all such seats are occupied
with passengers,
seating passengers second in the single remaining aisle
seat in each row, and only then seating passengers in
the two remaining center seats."

Claim 6 according to each of the second and third
auxiliary requests reads:

"In a single deck airplane of fixed dimensions, having
standard seats, two aisles and eight abreast seating,
the seating configuration comprising a two-seat unit
and two three-seat units."

Claim 6 according to the fourth auxiliary request reads:

"The process of any of the preceding claims, wherein
the airplane has fixed dimensions and standard seats,
the airplane further having two aisles and eight
abreast seating, and wherein the seats are installed in
said airplane in a configuration comprising a two-seat
unit and two three-seat units."

Claim 6 according to the fifth auxiliary request reads:

"An airplane of fixed dimensions, having standard seats arranged in a plurality of rows at a predetermined pitch, two aisles and eight abreast seating, wherein the seats are arranged in a configuration comprising a two-seat unit and two three-seat units, wherein the pitch is reduced with respect to a pitch that would provide an equivalent amount of total useful area per passenger when the seats would be arranged in a configuration comprising two two-seat units and a four-seat unit, said total useful area being the sum of the area of the seat and the average useful additional area per passenger (AUAAP), and wherein an additional row of seats is arranged in an area of the airplane made available by the reduced pitch."

Claim 6 according to the sixth auxiliary request reads:

"A process for increasing the chance that a passenger seated within an airplane having fixed dimensions operating at typical load factors will be seated next to an empty seat, the airplane having a passenger compartment bounded by side walls and in which a plurality of standard passenger seats are arranged in rows, the airplane further having two aisles and eight abreast seating, said process comprising for each row:

- a) installing a three-seat unit within said airplane between one of said side walls and a first aisle closest to said side wall,
- b) installing a two-seat unit within said airplane between said first aisle and the second aisle, and
- c) installing another three-seat unit within said airplane between said second aisle and the other side

wall of said airplane,
said process further comprising seating passengers first in the two seats in each row that are closest to each of said side walls and the three seats in each row that are closest to said aisles and that are adjacent to an empty seat, until all such seats are occupied with passengers, seating passengers second in the single remaining aisle seat in each row, and only then seating passengers in the two remaining center seats."

Claim 6 according to the seventh auxiliary request reads:

"A process for increasing the useful additional area for a passenger seated within an airplane having fixed dimensions operating at typical load factors will be seated next to an empty seat, the airplane having a passenger compartment bounded by side walls and in which a plurality of standard passenger seats are arranged in rows, the airplane further having two aisles and eight abreast seating, said process comprising for each row:

- a) installing a three-seat unit within said airplane between one of said side walls and a first aisle closest to said side wall,
 - b) installing a two-seat unit within said airplane between said first aisle and the second aisle, and
 - c) installing another three-seat unit within said airplane between said second aisle and the other side wall of said airplane,
- said process further comprising seating passengers first in the two seats in each row that are closest to each of said side walls and the three seats in each row that are closest to said aisles and that are adjacent

to an empty seat, until all such seats are occupied with passengers, seating passengers second in the single remaining aisle seat in each row, and only then seating passengers in the two remaining center seats."

VI. The parties' submissions as regards novelty of claim 6 according to the main request may be summarised as follows:

The appellant's view was that the essence of the invention resides in a method for optimising passenger comfort and that the presently claimed seating configuration results from that method and cannot be considered in isolation from it. Novelty of claim 6 could only be denied if a known seating configuration was disclosed as improving passenger comfort. Even if that would not be accepted D2 is not relevant state of the art. At the time that D2 was published FAA regulations did not provide for more than one aisle in the interior of a passenger aircraft. Moreover, the emergency evacuation requirements in force at that time effectively prohibited four-seat units. The regulations were later changed to allow the 2\4\2 configuration and they effectively confined three-seat units to single aisle aircraft. The aircraft cabin of D2 therefore would not be considered as useful prior art by the skilled person working in accordance with more recent regulations. As a result, D2 is to be considered as having moved to a distant technical field.

The respondent, on the other hand, took the view that claim 6 contains no reference to the method of the patent. Moreover, the requirement of the EPC in respect of novelty is absolute. Even in the case of accidental

anticipation it is necessary to establish novelty by the use of a disclaimer.

VII. As regards claim 6 according to the first auxiliary request:

The respondent took the view that the claim is unclear because it defines a process which eliminates choice in the allocation of seats and therefore is unrealistic. It would be impossible to determine when the claim is infringed if passengers do not sit in allocated seats. The board questioned whether the meaning of "typical load factors" is clear. The respondent further argued that whereas the process claims as granted were directed towards creating a seat configuration for optimising comfort, present claim 6 is directed towards the use of that configuration to optimise comfort and so reverses the process. Furthermore, paragraph [0012] of the patent specification specifies results obtainable with the processes of claims 1 and 4 as granted, not that of present claim 6. As a result, the scope of protection is extended. Extension of the scope of protection also results from the fact that the change of claim category from the product claim as granted does not correspond to that which was explicitly allowed in accordance with decision G 2/88. The board raised the additional point that the claim was directed to a process for increasing the chance that a passenger in an aircraft operating at typical load factors would be seated next to an empty seat. However, the steps of the claim extended to seating passengers at load factors beyond those for which the disclosed method of assigning seats would achieve this result. This could not only render the claim unclear

but also extend the subject-matter beyond that of the application as originally filed.

The appellant's rebuttal was that the claim would be infringed only if seats in an aircraft are assigned in the specified manner but that anyway the requirement of clarity according to Article 84 EPC 1973 does not relate to matters of infringement. Moreover, there is no reversal of the subject-matter of the process claims since the seats must be provided in the specified configuration before passengers can be assigned to them. The "typical" load factors as disclosed in the application are those at which the greater comfort is achievable as a result of a passenger being placed next to an empty seat. Paragraph [0012] of the patent specification discloses the increased chance of this happening.

VIII. As regards claims 6 according to the second and third auxiliary requests:

The respondent objected that there was no original disclosure of a claimed seating configuration in a single deck aircraft. The final paragraph of the application as originally filed refers to improving the Boeing 747 aircraft which is generally known to not be single deck. There was no implicit disclosure since the configuration of the seats is independent of the deck configuration. The feature of a single deck could not be considered as a positive disclaimer since the conditions for providing a disclaimer are not met.

The appellant argued that at least for the eight-abreast seating configuration of claim 6 the single

deck feature was explicitly disclosed in figure 1 since that shows an aircraft to which the invention relates. Moreover, for the skilled person there was an implicit disclosure of a single deck since an eight-abreast configuration in combination with a lower cargo deck efficiently occupies the conventional shape of fuselage. The appellant moreover took the view that even if the feature of the single deck were not originally disclosed it would be allowable as a disclaimer since D2 is to be regarded as an accidental anticipation for the reasons given in respect of the main request.

IX. As regards claim 6 according to the fourth auxiliary request:

The respondent argued that the addition of dependent claims was not appropriate to overcoming a ground for opposition and so not allowable under Rule 80 EPC. The board added that, although the claim was presented as dependent it appeared not to be genuinely so because it merely contained product features resulting from the processes of claims 1 to 5. Moreover, the claims had been filed after the oral proceedings had been arranged and consideration of them for novelty and inventive step would introduce a new aspect into the appeal proceedings.

The appellant replied that in accordance with case law late-filed requests should be accepted if clearly allowable. These claims merely add further restriction to the claims which have already been found allowable. The respondent's objection under Rule 80 EPC is not valid since the amendment clearly is a response to the grounds for opposition.

X. As regards claim 6 according to the fifth auxiliary request:

The respondent objected that the claim is unclear. It is not specified whether the "predetermined pitch" is that of the new or the comparative configuration. Moreover, the "total useful area" cannot be determined because the value of the AUAAP is dependent on which questions are asked of which passengers. The board also put into question whether the AUAAP is a value inherent to the aircraft as such since it seems also to be dependent on the way the aircraft is used. Another issue addressed by the board was whether the claim is an admissible generalisation of a particular example.

In the view of the appellant the AUAAP is fully disclosed in the patent specification. The skilled person is aware which questions are asked and all surveys provide the same results. The general disclosure of maximising the number of seats is to be found in paragraph [0006] together with figures 13, 14 of the patent specification.

XI. As regards claim 6 according to the seventh auxiliary request:

The respondent raised essentially the same objections as for claim 6 of the first auxiliary request.

The appellant stated that the amendments with respect to claim 6 of the first auxiliary request were made in order to overcome potential objections of lack of

clarity and original disclosure of the "chance" aspect of that claim.

Reasons for the Decision

1. The patent relates generally to the configuration of passenger seats in an aircraft. Claims 1 to 5, which were found by the opposition division to be allowable, define methods by which a seating configuration providing optimum comfort level may be found. The patent is based on the finding that passengers are most comfortable when seated next to an empty seat. The concept extends also to trading the increased comfort for a reduction in the space available to a passenger, thereby enabling the accommodation of more passengers within the same space at unchanged comfort level. Each of the appellant's requests contains claims 1 to 5 as granted and approved by the opposition division and in addition at least a respective claim 6 which is treated below.

Main request

2. Claim 6 according to this request is directed towards an aircraft having a particular seat configuration. According to the appellant this configuration results from the methods of the patent and this is to be taken into account when considering novelty. However, claim 6 according to this request merely specifies an aircraft having certain features and is not limited to one obtained by a method according to the patent or to one where passenger comfort is necessarily improved.

3. D2 is an article published in 1966 relating to the anticipated future development of Boeing 747 aircraft. It discloses a Boeing 747-137 two-deck aircraft having eight-abreast seating. In the lower deck the seats are arranged as 3\2\3 (that is a three-seat unit, an aisle, a two-seat unit, an aisle and a further three-seat unit). The article reports that Boeing were speaking with airline operators in the hope of winning customers for their designs in preference to those of a competitor. The report includes projections of details such as cost, payload and dimensions. The proposed seating configurations are both explained in writing and shown diagrammatically. It follows that the seating configuration in D2 does not simply result from a draughtsman's desire to present a complete drawing but is a deliberate presentation of information. The skilled person would understand from D2 that the indicated seating configuration was an important part of the proposed aircraft.

3.1 The appellant does not contend that the subject-matter of claim 6 of this request differs from the disclosure of D2 but argues that the anticipation is to be regarded as "accidental" within the meaning of decision G 1/03, reasons 2.2.2 (OJ EPO 2004, 413). However, irrespective of the status of D2 in that regard (which is treated later in this decision in respect of the second and third auxiliary requests) the concept of novelty within the meaning of the EPC is absolute (Singer/Stauder, "Europäisches Übereinkommen", 4th edn., Cologne: Heymanns, 2000, Art. 54, margin No. 2).

- 3.2 The board concludes from the foregoing that the subject-matter of present claim 6 is not new with respect to the disclosure of D2 and the request therefore fails.

First auxiliary request

4. Claim 6 according to this request specifies a process "for increasing the chance that a passenger seated within an airplane ... operating at typical load factors will be seated next to an empty seat ...". The claim defines steps of the process include seating passengers at side walls and aisle seats in accordance with a particular regime and finally "... seating passengers in the two remaining centre seats."

- 4.1 The parameter "load factor" represents how much of the capacity of an aircraft's seats is used. The finding underlying the present patent is that passengers feel more comfortable when seated next to an empty seat and according to the patent specification this is applicable for load factors within the range 50% to 87.5%. The concept of a "typical load factor", however, is not disclosed in the patent specification. Figure 8 shows a "typical distribution" of load factors. It shows in particular that load factors of about 40%, 80% and 100% each occur with an equal frequency. The skilled person therefore can derive that 40% and 100% load factors, for which application of the finding of the present patent should provide no benefit, occur as often as does an 80% load factor, which falls within the advantageous range. It is stated in the patent specification that "average load factors typically fall between 60% and 70%". However, according to the graph

of figure 8 load factors between 46% and 60% occur approximately as often as those in the range of 60% to 70%. Moreover, the information presented in the patent specification is based on statistics which may differ in dependence on, for instance, an airline's pricing policy and the use of overbooking and standby procedures. In view of the foregoing the boundaries of "typical load factors" are obscure and the claim is unclear in defining the subject-matter to be protected (Article 84 EPC 1973).

4.2 As set out above, the improved comfort is achievable for passengers in an aircraft occupied with a load factor of 50% to 87.5%. However, since the final step of present claim 6 specifies seating passengers in the final two seats of an eight-abreast row the subject-matter of the claim extends beyond an 87.5% load factor. The claim is therefore unclear because it specifies steps which extend outside of the range in which the improved comfort is achievable. Moreover, the subject-matter of the claim goes beyond the disclosure of the application as originally filed by attempting to apply the process to load factors in excess of 87.5% (Article 123(2) EPC).

4.3 The lack of clarity of the claim moreover makes it impossible to determine any effect of the claim on the scope of protection afforded by the patent (Article 123(3) EPC).

Second and third auxiliary requests

5. Common to claims 6 according to these requests is the introduction of the feature that the aircraft has a

single deck. With this amendment the appellant aims to establish novelty of the subject-matter with respect to the disclosure of D2. The appellant argues that this feature was originally disclosed but that, even if that were not the case, the feature should be allowable as a disclaimer in order to establish novelty with respect to what it regards as an accidental anticipation in the form of D2.

- 5.1 The appellant's main argument in support of the disclosure of the single deck feature is that figure 1 of the application as originally filed shows an aircraft to which the invention is to be applied and that it evidently is a single deck aircraft.
- 5.1.1 The application as originally filed explicitly states that figure 1 is an illustration of a known aircraft: "a modern twin-aisle airplane ... a contemporary 2\4\2 seating arrangement". The only aspect of this disclosure which was relevant to the number of decks was in the figure itself but there was no explicit statement to the effect that the invention should be applied to such an aircraft. Moreover, it would be implicit to the skilled person that the theory of the application would be applicable within any individual deck irrespective of the presence of any other deck and so equally applicable to both single and twin deck aircraft. Indeed, it was stated in the final paragraph of the description that the invention had been usefully applied to a Boeing 747 which the skilled person would know to be a twin deck aircraft.
- 5.1.2 The appellant argues that there was an implicit disclosure of a single deck aircraft with eight-abreast

seating because the skilled person would be aware that this arrangement would be conveniently accommodated in combination with a cargo deck in a conventional fuselage. The board cannot agree since the original disclosure relates only to the configuration of seating and the manner of accommodating this in an aircraft fuselage was left entirely open.

5.2 The board concludes that the feature of a single deck aircraft was not disclosed within the context of the invention (Article 123(2) EPC).

5.3 The appellant argues, however, that the single deck feature is allowable as a disclaimer in order to exclude the subject-matter of what it sees as an accidental anticipation by D2. Although "single deck" may not correspond to the normal negative format of a disclaimer the appellant had indicated its willingness to reformulate the wording. It is therefore necessary only to establish whether the principle of a disclaimer is applicable in the present case.

5.3.1 The use of disclaimers was the subject of decision G 1/03 (*supra*), according to which one may be used to establish novelty with respect to an accidental anticipation. An anticipation was defined as accidental "if it is so unrelated to and remote from the claimed invention that the person skilled in the art would never have taken it into consideration when making the invention".

5.3.2 The appellant's view is that the skilled person concerned with the subject-matter of the present patent would not have considered D2 because it was not in

accordance with applicable regulations at the time of its publication and subsequent change in the regulations effectively confined three-seat units to single aisle aircraft. However, as acknowledged in the patent specification at the priority date of the present patent, some 27 years after the publication of D2, two-aisle configurations were conventional. Moreover, the subject-matter of the present claim is merely an aircraft having a particular seating configuration and the claim specifies no relationship to the methods contained elsewhere in the patent specification. When judging whether the skilled person would consider D2 it is therefore necessary to view it not in the light of the method of claims 1 to 5 but in the light of the subject-matter of present claim 6 in isolation. D2 evidently belongs to the same technical field as the present patent and the board is satisfied that there is no reason why the skilled person would not have considered the disclosure of D2 in this respect.

5.3.3 It follows that D2 cannot be considered as an accidental anticipation within the meaning of G 1/03 (*supra*) and that the conditions for establishing novelty by using a disclaimer have not been fulfilled.

6. Since the feature that the aircraft has a single deck neither was disclosed in the application as originally filed (Article 123(2) EPC) nor can be used as a disclaimer the respective claims 6 are not allowable and the corresponding requests fail.

Fourth auxiliary request

7. Claim 6 according to this request is a new claim presented as dependent on any of the process claims 1 to 5. This request was filed after the oral proceedings had been arranged and one month before they took place and therefore is subject to the provisions of Article 13(3) RPBA. Article 13(3) RPBA provides that "amendments sought to be made after oral proceedings have been arranged shall not be admitted if they raise issues which the Board or the other party or parties cannot reasonably be expected to deal with without adjournment of the oral proceedings."

7.1 In the present case during the opposition procedure the only ground for opposition raised against claims 1 to 5 as granted was that of sufficiency of disclosure (Article 100(b) EPC 1973). The opposition division found that this ground for opposition did not prejudice maintenance of claims 1 to 5 as granted. Moreover, on the basis of the appellant's requests during the appeal proceedings prior to those submitted with the letter of 23 December 2007 the matter of inventive step of the subject-matter of those claims never played a role. However, the filing of present claim 6 adds product features to the steps of the process claims 1 to 5. These features cannot merely be seen as refinements of the process already defined in claims 1 to 5 as put forward by the appellant. Indeed it could be argued that new claim 6 is an attempt to introduce a disguised "product-by-process" claim. Be that as it may, it appears that some of the additional features such as a fixed dimension of aircraft and standard seats may establish pre-conditions for the process and so may affect the judgement of inventive step of the process. This is a new matter in the appeal proceedings which

the board and the respondent would have been unable to satisfactorily address during the oral proceedings. The present request therefore is not admitted in accordance with Article 13(3) RPBA.

Fifth auxiliary request

8. Claim 6 according to this request is directed towards an aircraft in which a trade-off has been made between passenger comfort and increased numbers of seats. By changing the seat configuration the number of passengers which may be next to an empty seat is increased and the pitch of the seating is reduced to accommodate more passengers whilst offering the same comfort level as with an earlier seating configuration.

9. The claim specifies that the total useful area per passenger is the sum of the area of a seat and a parameter termed the average useful additional area per passenger (AUAAP). The AUAAP is defined in paragraph [0057] of the patent specification: "The average amount of UAAP enjoyed by passengers in a given configuration under varying load factor conditions, AUAAP, is equal to the UAAP at each possible load factor weighted by the frequency of occurrence of that load factor and the number of passengers on board at that load factor." From this it is derivable that the AUAAP depends on the relative frequency of occurrence of various load factors. However, frequency of occurrence of a load factor is a parameter which relates to the operation of an aircraft and is not inherent to the aircraft itself. Although the parameter AUAAP is being used merely to enable the comparison between two seating configurations, whether any particular configuration

falls within the scope of the claim will depend on the value of the AUAAP. The claim is therefore unclear in defining the subject-matter to be protected (Article 84 EPC 1973).

Sixth auxiliary request

10. Claim 6 according to this request differs from that according to the first auxiliary request only in that it specifies a 3\2\3 layout instead of 2\3\3. Claim 6 according to the first auxiliary request has been found in points 4 to 4.2 above to be unclear (Article 84 EPC) and to contain subject-matter which extends beyond the content of the application as originally filed (Article 123(2) EPC). Moreover, the deficiency of clarity of the claim is such that the board was unable to determine the effect of the claim on the scope of protection afforded by the patent (Article 123(3) EPC) (point 4.3). None of those findings results from the seating configuration specified in the claim. Since the seating configuration is the only feature which distinguishes the respective claims 6 according to the first auxiliary request and the present request it follows that the present claim suffers from the same deficiencies.

Seventh auxiliary request

11. Claim 6 according to this request differs from that of the first auxiliary request only in as far as the wording "the useful additional area for a passenger seated within an airplane" replaces "the chance that a passenger seated within an airplane". According to the appellant this change was intended to overcome

potential objections of lack of clarity and/or a lack of original disclosure of the replaced wording. However, as for the sixth auxiliary request (see point 10 above) deficiencies resulting from other parts of the claim are unaffected by this amendment and the same objections arise.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

A. Vottner

S. Crane