



**PATENTS ACT 1977**

APPLICANT Premium Aircraft Interiors Group Limited

ISSUE Whether patent application number  
GB 0723686.2 complies with section  
1(1)(b)

HEARING OFFICER Phil Thorpe

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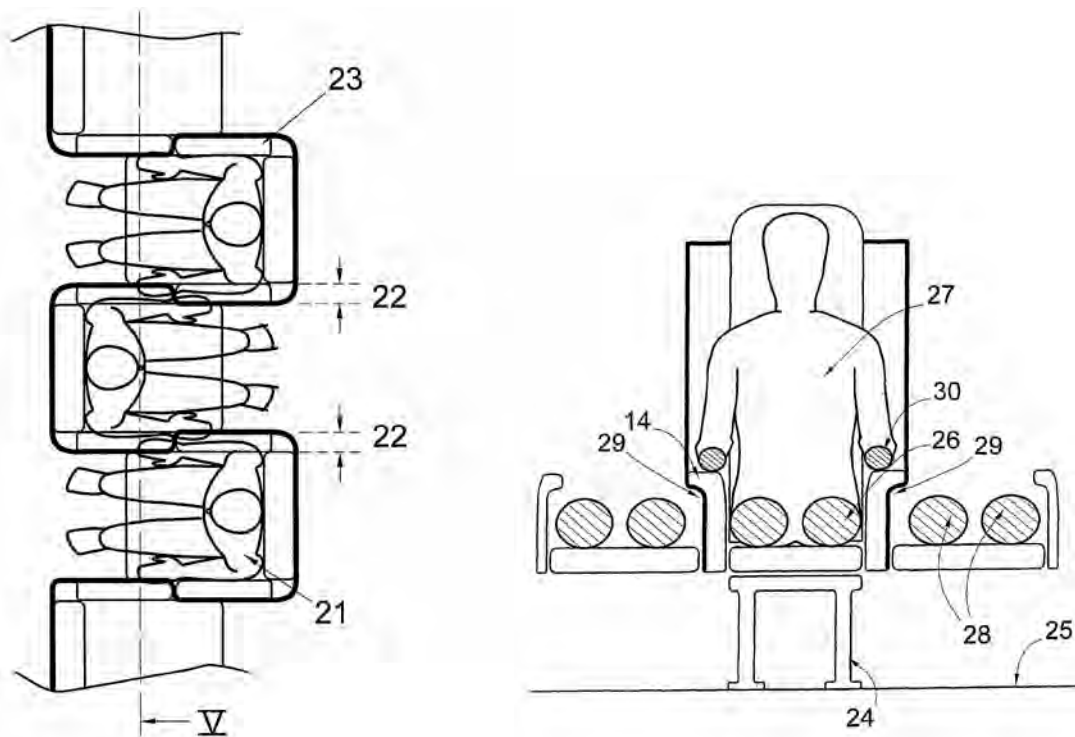
**DECISION**

1. Patent application WO 2007/003889 A1 was filed by Premium Aircraft Interiors Group Limited on 27 June 2006. The application entered the national phase as GB0723686.2 and was published as GB 2441687. It concerns an arrangement of seats in an aircraft.
2. The examiner has cited a number of prior art documents which he considered demonstrate that the invention is not new and does not involve an inventive step. The applicant has amended its claims a number of times and in doing so has been able to overcome the objection that the invention is not new. The applicant was not however able to satisfy the examiner that the invention did involve an inventive step and the matter came before me at a hearing on 30 March 2010. The applicant was represented by Mr Miles Copeland of Counsel instructed by Mr Nigel Brookes.
3. In light of discussions at the hearing, I invited the applicant to file a further submission providing further clarification on the meaning of a specific term used in the claims and also clarifying which features added into claim 1 during the prosecution are maintained and identifying in the applicants view what clarity objections if any were outstanding. The applicant duly filed a submission on 6 April 2010.

**The invention**

4. According to the specification the present invention has its basis in the realisation that if passengers in an aircraft are seated facing in alternate directions, with their torsos and shoulders longitudinally spaced from each other in rows, then the lateral spacing between individual seats can be reduced (as shown in figures 4 and 5 of the application which are reproduced below). This

allows for more seats to be accommodated. For example in a wide bodied aircraft, typically with eight/nine seats per row, this enables an increase in one in the number of seats across the aircraft.



5. The claims have been amended a number of times during prosecution. The version considered at the hearing was filed on 5 January 2010. There is only one independent claim which reads:

Claim 1 - Aircraft transport seating comprising:

a plurality of rows of at least three side-by-side transport seats,  
each seat comprising:  
a seat cushion and  
a fixed or partially reclinable seat back, and  
each row being formed as an integral unit, and each row comprising:  
at least one seat facing in one direction  
at least one adjacent seat facing in the opposite direction and  
at least two seats having an oppositely facing adjacent other  
seat;

wherein:

the seat cushions are at least partially interdigitated with at least one  
having other adjacent ones on both sides,  
the seat cushions define a row axis at the median axis of their  
interdigitated parts,  
the seat backs, at least when not reclined, are arranged on two lines

spaced from the row axis and alternately facing ones of the seats are arranged at a pitch along the row axis less than conventional shoulder width, whereby the shoulder(s) of a passenger in one of the seats facing one direction can extend over the leg space of the passenger(s) in the oppositely facing adjacent seat(s).

6. In the course of the hearing and in the submission filed subsequent to the hearing an alternative claim 1 was proposed. This reads, with changes highlighted:

Claim 1 - Aircraft transport seating comprising:

a plurality of rows of at least three side-by-side transport seats, each seat comprising:  
a seat cushion and  
a fixed or partially reclinable seat back, and  
each row ~~being formed as an integral unit, and each row~~ comprising:  
at least one seat facing in one direction  
at least one adjacent seat facing in the opposite direction and  
at least two seats **facing in one direction both having an oppositely facing adjacent other seat** ~~having an oppositely facing adjacent other seat;~~

wherein:

the seat cushions are at least partially interdigitated with at least one having other adjacent ones on both sides, the seat cushions define a row axis at the median axis of their interdigitated parts, the seat backs, at least when not reclined, are arranged on two lines spaced from the row axis and alternately facing ones of the seats are arranged at a pitch along the row axis less than conventional shoulder width, whereby the shoulder(s) of a passenger in one of the seats facing one direction can extend over the leg space of the passenger(s) in the oppositely facing adjacent seat(s).

7. These changes have been made in an attempt to clarify the scope of the invention. I will consider the allowability of both the 5 January 2010 claim and the later filed alternative claim.

### **Inventive Step**

8. The requirements for inventive step are set out in section 1(1)(b) and 3 of the Patents Act. Guidance on the approach to assessing inventive step was provided by Jacob LJ in *Pozzoli Spa v Bruno SA* [2007] EWCA Civ 588. Jacob LJ proposed in paragraphs 14 to 23 a slightly modified approach to that set out in the *Windsurfing* case.
9. The modified approach, which Mr Copeland accepted was the appropriate one to follow, involves the following steps:

- (1)(a) Identify the notional “person skilled in the art”;
- (1)(b) Identify the relevant common general knowledge of that person;
- (2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;
- (3) Identify what, if any, differences exist between the matter cited as forming part of the “state of the art” and the inventive concept of the claim or the claim as construed;
- (4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

### **The Person Skilled in the Art**

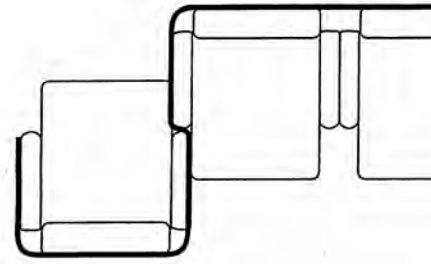
10. The examiner identified the person skilled in the art as the person skilled in the art of aircraft seating design, manufacture and safety testing. The applicant accepted that nothing really turned on this point but suggested that it was what it refers to as a Layout of Passenger Accommodation (LOPA) designer. The applicant also noted that for the entirety of the subject matter this designer would be supplemented by a mechanical engineer.

### **The Relevant Common General Knowledge**

11. In his examination report of 11 November 2009, the examiner suggested that the skilled person would readily appreciate that it is desirable to fit as many seats as comfortably and safely as possible into a given accommodation space on an aircraft. The structural integrity of the seating in the event of a crash, ease of access and exit and their cost would all be considerations. The common general knowledge would further comprise knowledge of the construction of the framework for rows of aircraft seats. Mr Copeland noted that the examiner had not substantiated any of this. For his part he was of the view that the issue of common general knowledge was largely irrelevant given the distance between the prior art and the invention as claimed.

### **The Inventive Concept**

12. The question of what is the inventive concept of claim 1 has been the subject of much correspondence during the examination of the case and of much discussion at the hearing. The reason for this is not in my view that the general underlying inventive concept is not clear. I think it is. Rather the language used to define the invention in the claims has not always been clear and repeated efforts to clarify it, or to more clearly distinguish the invention from the prior art, have at times introduced further uncertainty. Claim 1 has, not unjustifiably, also been drafted so as to cover a range of configurations of seats disclosed in the application including those shown in the figures above and also in the following figure. This has further complicated the drafting.



13. The claim can however be readily construed at least up to the final two requirements set out in the characterising part of the claim. There is some unnecessary duplication in the earlier part of the alternative claim however this does not cloud the meaning of the claim. For example the requirements in the alternative claim that at least one seat faces in one direction and that at least one adjacent seat faces in the opposite direction is met by the new additional statement that at least two seats face in one direction both having an oppositely facing adjacent other seat.
14. The latter part of the characterising clause, which is common to both versions of the claim, does require closer inspection. I start with the reference to “conventional shoulder width”. I asked Mr Copeland at the hearing whether this was a term well known in the art. He noted that the term was defined in the description as 22 inches or 560 mm.<sup>1</sup> At the hearing and in a subsequent submission that I invited him to file, he argued that the term was perfectly clear and that the phrase “conventional shoulder width” had been used in the claim so as to “encourage addressee to think in terms of the reason for the actual dimension as opposed to merely the actual dimension”. I now accept that this phrase is sufficiently clear. Indeed it is much better than “available shoulder width” which appeared in earlier amendments.
15. The final characterising feature of claim 1 is that the shoulder or shoulders of a passenger in one of the seats facing one direction can extend over the leg space of the passenger or passengers in the oppositely facing adjacent seat or seats. Mr Copeland argued that this feature is really a consequence of the squeezing up of the oppositely facing seats. I accept that if the seats are at a pitch less than the conventional shoulder width then a person with shoulders of that width or greater would have their shoulders extending over the leg space of the adjacent passengers. The use of the phrase “can extend” in the claim however somewhat broadens this limitation so as for example to cover an arrangement whereby a passenger is able to lean over so that their shoulder is over the leg space of the adjacent passenger. In the event nothing really turns on this as the crucial aspect is that the pitch of the seats is less than the conventional shoulder width.
16. Having construed the claim I turn now to considering the differences between the invention and the cited prior art

## The Prior Art

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<sup>1</sup> Page 2 lines 4&5 of the description as filed state “Conventional shoulder width for these purposes is defined as 22 inches or 560mm”.

17. The examiner relies on two pieces of prior art. These are WO00/21831 A2 (BRITISH AIRWAYS PLC) and US5335963 A (MUELLER).

18. WO 00/21831, which was published on 20 April 2000, discloses a seating arrangement for an aircraft having a pair of seats facing in opposite directions. As shown in figures 3 and 4 of the specification each seat has a seating portion (8), a back portion (7) and a secondary support unit (5a & 5b) to support the feet of the occupant. Each seat has a housing (6 & 16) within which the seats can recline and which also provide privacy between adjacent seats.

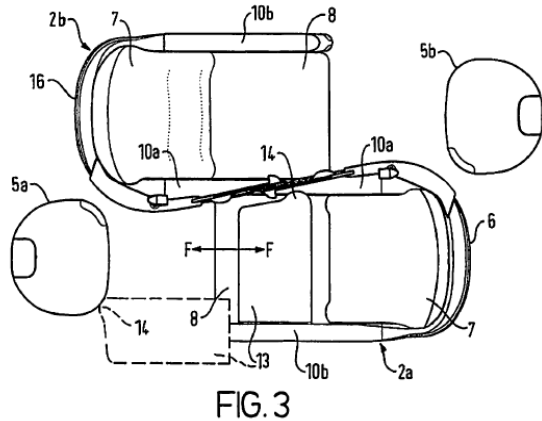


FIG. 3

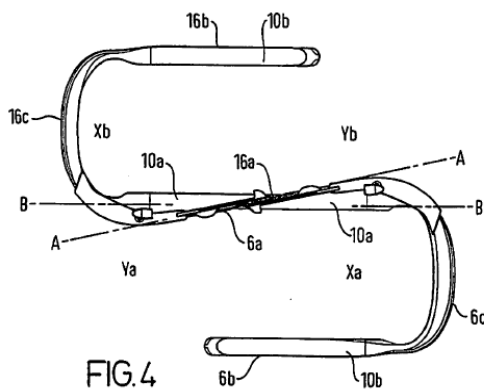


FIG. 4

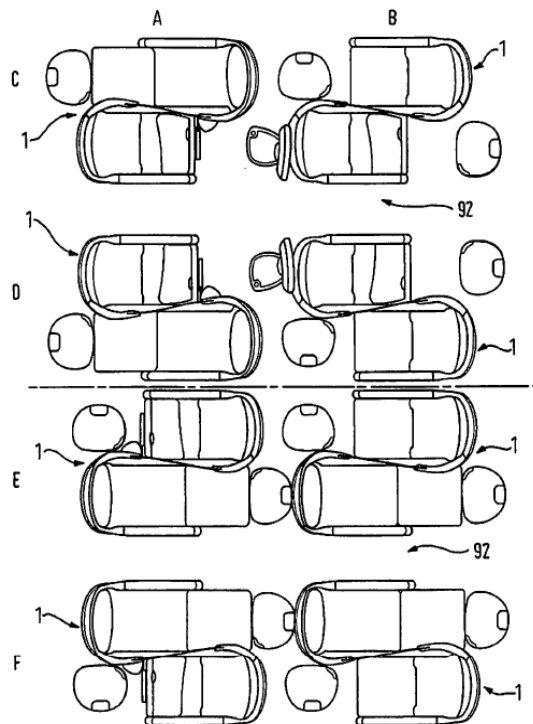
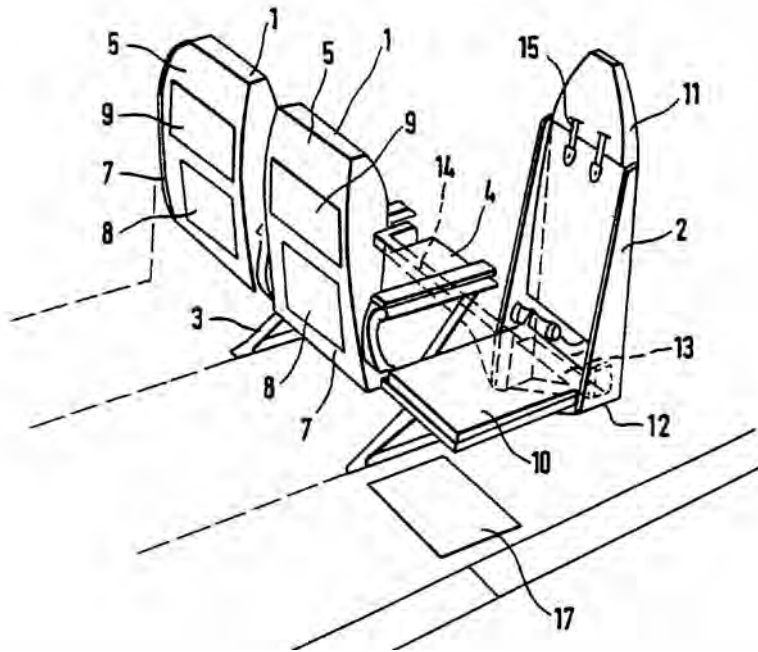


FIG. 11

19. The seating units are positioned each side of a notional dividing line corresponding to the longitudinal axis B-B of the pair of seating units. The housings are shaped so that the major occupancy area (Xa) of the first seating unit (2a) extends over the dividing line B-B at the minor occupancy area (Yb) of the second seating unit (2b) and so that the major occupancy area (Xb) of the second seating unit extends over the dividing line B-B at the minor occupancy area (Ya) of the first seating unit. Thus, extra space is provided where it is needed for the upper body of a passenger and less space, where it is not needed, for the legs. Figure 11 of the specification shows a number of such pairs of seats arranged across an aircraft cabin

20. The examiner has argued that this document differs from the inventive concept of claim 1 merely in that the row of at least three seats is not formed as an integral unit (as required by the previous wording of the claim).

21. At the hearing Mr Copeland argued that the most recent alternative claim more clearly distinguishes the inventive concept from WO 00/21831 notwithstanding that the requirement that the seats are formed as an integral unit is no longer a requirement. He argues in particular that this document does not teach the main feature of the invention namely that alternately facing ones of the seats are arranged at a pitch along the row axis less than the conventional shoulder width. Indeed WO 00/21831 is silent on the actual pitch of the seats. He accepts that there is some degree of overlap however he argues that a person skilled in the art would readily appreciate that the pitch of the seats in WO 00/21831 is not less than the conventional shoulder width. He refers me to the layout in figure 11 which shows only 8 seats in a row which given the space available in a wide body aircraft clearly indicates that the pitch of the seats have not been reduced to less than the conventional shoulder width. He also notes that the seats in WO 00/21831 fully recline into a horizontal position and therefore cannot be of a pitch less than the conventional shoulder width. There is I believe considerable force in these arguments.
22. Mr Copeland also argues that the arrangement in WO 00/21831 is such that the shoulder of a passenger in one of the seats facing one direction cannot extend over the leg space of the passenger in the oppositely facing adjacent seat. He refers to the physical divider between the seats in WO 00/21831 which would prevent the shoulders from extending over the leg space of the adjacent passenger. The examiner has rightly identified that the physical divider is not an essential feature of the invention as claimed in WO 00/21831. However that in itself does not mean that the document teaches or conveys sufficient information that the shoulders of a passenger can extend over the adjacent leg space. In fact the whole teaching of WO 00/21831 is towards providing separation and privacy between adjacent passengers. On that basis I do not believe that WO 00/21831 discloses the feature of a seating arrangement whereby the shoulder(s) of a passenger in one of the seats facing one direction can extend over the leg space of the passenger(s) in the oppositely facing adjacent seat(s). I should add that even if I am wrong on this then it will not have altered my final decision.
23. The second piece of prior art is US 5335963 which was published on August 9 1994. It relates to the provision of a crew seat for use during take-off and landing and during emergencies. The crew seat is mounted to the end of a row of passenger seats and as shown below can face in an opposite direction.



24. Mr Copeland argues that there is again no suggestion in this document of alternately facing seats arranged at a pitch along the row axis less than conventional shoulder width. He notes that the shoulder width of the crew seat is unclear, as is its precise position (though presumably the arm rest of the passenger seat must lie outside the line of the pivotable crew seat). Nor is there any disclosure that the shoulder of the passenger or the crew member can extend over the leg space of the other.
25. His first point is stronger than his second. The requirement that the arrangements of the seats is such that the shoulder of the passenger (or crew member) can extend over the leg space of the adjacent passenger is I believe met by US 5335963. It is not necessary to actually disclose this happening. It is sufficient as I have noted that the seat arrangement is such that it can happen. And the clear disclosure in this document of an open design of seat, in contrast to WO00/21831, does mean that the shoulders can extend over the leg space of the adjacent passenger. I do however accept Mr Copeland's first point that there is no disclosure that the pitch of adjacent seats, even when one of those is the crew seat, is less than conventional shoulder width.
26. In addition, though I do not believe this point was argued, US 5335963 does not disclose two rows of such seats as required by the claim.
27. In conclusion, I find that neither piece of prior art discloses seats that are arranged at a pitch along the row axis less than conventional shoulder width. In addition WO00/21831 does not disclose an arrangement where the shoulder(s) of a passenger in one of the seats facing one direction can extend over the leg space of the passenger(s) in the oppositely facing adjacent seat(s). And finally US 5335963 does not disclose two rows of seats as required by the claim.



## **Are these differences obvious?**

28. As noted, neither of the prior art documents discloses nor suggests in any way one of the principal features of the invention namely the concept of reducing the pitch of adjacent aircraft seats to less than the conventional shoulder width. Whereas there is some degree of space saving in the seat arrangement of WO00/21831, this is not achieved by reducing the pitch of seats. Indeed the teaching of this document is opposite to that of the invention in that it seeks to preserve the privacy and space of adjacent passengers. In contrast the invention relies in effect on an actual physical encroachment into the space of the next passenger. US 5335963 would equally not lead a skilled person to the idea of reducing the pitch of adjacent seats. Rather as noted it only relevant teaching is that of having a single seat facing in an opposite direction to all the other seats.
29. Hence I can see no basis for either of these documents rendering the invention as claimed obvious to the person skilled in the art.
30. For completeness I will say something on the possibility of mosaicing these two documents together to form the basis for an inventive step objection as this has been proposed earlier by the examiner in the context of earlier and less clear versions of the claims. It was also discussed at the hearing. It is sufficient for me to say that even if it was likely that the skilled person would consider the teachings of these documents together, and I am doubtful of that, the combined disclosure would still not be sufficient to render claim 1 obvious.
31. In conclusion therefore I find that the invention as claimed in both the 5 January 2010 claim 1 and the later filed alternative claim 1 is inventive having regard to WO00/21831 and US5335963.

## **Next steps**

32. The Section 20 period was originally due to expire on 1 January 2010. This was extended as of right to 1 March 2010. At the hearing the applicant requested a further extension to this period. This further extension would in accordance with rule 108 require the filing of a further Form 52 by 1 May 2010. Unfortunately, possibly because of imprecise direction from me at the hearing, no such form 52 appears to have been filed. There may be justification to invoke Rule 107 to extend the period for filing the Form 52. However given that I have found the claims filed on 5 January 2010 to be allowable that it is not necessary to extend the Section 20 period beyond 1 March 2010 to accommodate the later filed alternative claims.
33. These alternative claims and accompanying description that were filed on 6 April 2010 are clearer than the specification as of 5 January 2010 and therefore should form the basis of the granted patent. Amendments filed after the Section 20 period has expired are allowed if the application was in order as of the end of the Section 20 period and if they do not necessitate substantial re-examination or

further search. That is the case here. I should note that the applicant has raised the possibility of filing further drawings to remove some duplication of numbering. I do not consider this to be either desirable or necessary at this stage.

34. I am therefore returning the case to the examiner in order for him to send the application based on the amendments filed 6 April 2010 to grant.

**P J THORPE**

Deputy Director acting for the Comptroller