

**IN THE HIGH COURT OF JUSTICE**  
**CHANCERY DIVISION**  
**PATENTS COURT**

Royal Courts of Justice  
Strand, London, WC2A 2LL

Date: 21 January 2009

**Before:**

**THE HONOURABLE MR. JUSTICE LEWISON**

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**Between:**

<b>VIRGIN ATLANTIC AIRWAYS LIMITED</b>	<b><u>Claimant</u></b>
<b>- and -</b>	
<b>(1) PREMIUM AIRCRAFT INTERIORS GROUP LIMITED</b>	
<b>(2) PREMIUM AIRCRAFT INTERIORS UK LIMITED</b>	<b><u>Defendants</u></b>

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**Mr Richard Meade QC, Mr Henry Ward and Miss Jessie Bowhill** (instructed by **DLA Piper UK LLP**) for the Claimant.  
**Mr Mark Vanhegan and Miss Kathryn Pickard** (instructed by **Wragge & Co. LLP**) for the Second Defendant.

Hearing dates: 12,13,14,17,18,19,20,21,24,25,27,28 November 2008

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**Approved Judgment**

I direct that pursuant to CPR PD 39A para 6.1 no official shorthand note shall be taken of this Judgment and that copies of this version as handed down may be treated as authentic.

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THE HONOURABLE MR. JUSTICE LEWISON

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## **Introduction**

1. How does a business class passenger choose an airline? If you believe the advertising, the comfort of the seat is one of the most important factors. But it is not just the advertising. When Virgin Atlantic introduced its flat-bed seat into its Upper Class in November 2003 it achieved an increase in market share on its long haul routes of 12 per cent. So the numbers tell the same story. Virgin Atlantic’s flat-bed seat is known as the Upper Class Suite (or “UCS”) and is the commercialisation of a seat and seating system disclosed by patent EP (UK) 1,495,908 (the “908 patent”). The UCS

was manufactured for Virgin Atlantic by Premium Aircraft Interiors UK Ltd (known as “Contour”). Virgin Atlantic allege that Contour has manufactured other seats (known as “Rock” or “Solar Eclipse”, and a derivative called “Solar Premiere”), or kits for those seats, that infringe the 908 patent; and also allege that in working up the detailed designs of those seats Contour and its external designers, Acumen, have infringed its unregistered design rights in parts of the UCS. Contour deny all these allegations.

2. Mr Richard Meade QC, Mr Henry Ward and Ms Jessie Bowhill presented the case for Virgin Atlantic. Mr Mark Vanhegan and Ms Kathryn Pickard presented the case for Contour. The case was exceptionally well argued on both sides. A mass of points were taken both in relation to the design right issues and the patent issues. I have not found it necessary to deal with all of them. But I have, I hope, made all necessary findings of fact. The trial was mainly taken up with a detailed investigation of the question whether the Solar Eclipse was (or was based on) a copy of Virgin Atlantic’s UCS. It is convenient to deal with that question first.

## **Background**

3. In the early inter-war years of long distance air travel passengers were able to sleep on long haul flights fully recumbent; and were also able to dine with each other face to face. But the economics of air transport led the airlines to abandon that arrangement in favour of packing more passengers into their aircraft. Thus the almost invariable arrangement of accommodation for passengers was for the cabin to contain forward facing seats arranged in columns and rows. Depending on the class of travel, the width of the seats, and the pitch (or distance between them) could vary considerably, as the economy passenger, making his way through first or business class to the rear of the aircraft, knew only too well.
4. For the first class passenger, all this changed in 1996. In that year British Airways (“BA”) introduced a new seating system for its first class cabin called BA First, which allowed for a completely flat bed. The seat had been designed by Design Acumen (“Acumen”), a design house, and was design engineered and built by Contour for BA. It provided seats in individual “pods” or compartments formed by privacy screens. Each compartment consisted of both a seat and an ottoman (or footstool) which could be used both as part of the bed when the seat was laid flat and also as occasional seating by a guest passenger (hence it is sometimes called a “buddy seat”); and each seat was at a slight angle to the longitudinal axis of the plane, facing towards the cabin wall. This angled arrangement of seats is called a “herringbone”. Where the seats face towards the aisle the herringbone is called an “inward facing herringbone”; otherwise it is called an “outward facing herringbone”. The BA seating arrangement was an outward facing herringbone, which BA had adopted in preference to an inward facing herringbone because it gave passengers more privacy. Acumen had proposed both an inward facing herringbone and an outward facing herringbone; and mock-ups of both arrangements were made. It was the outward facing herringbone that was commercialised. BA patented its seat and seating system following a patent application filed in December 1995, which disclosed both the outward facing herringbone and the inward facing herringbone. I will revert to the details of this later.

5. BA First was enthusiastically received in the design world. Design Week gave it the award for “Product of the Decade”. Acumen were also the winners of many design awards for BA First. Mr Dryburgh, the managing director of Acumen, was justifiably proud of his company’s achievement. In addition the launch of BA First caused a considerable stir within the airline industry itself. All the main airlines decided that they needed to emulate BA’s ground-breaking idea; otherwise they were at risk of losing the highest paying passengers. A number of airlines immediately adopted the outward facing herringbone layout, the use of an ottoman and privacy screens to provide competitive products. These included United Airlines (UAL), American Airlines (AA), Swissair and many others. The introduction of flat-bed seats was, at this stage, limited to first class passengers. Because first class passengers pay such a lot of money for their tickets, the airlines could afford to be relatively generous with the space allotted to each passenger; mainly because the price of a first class ticket could be increased to counteract the loss of passenger numbers without adversely affecting overall revenue.
6. In 2000 American Airlines launched its Flagship Suite. It was also an outward facing herringbone. The particular innovation of this seat was that it was a swivelling seat. This meant that the passenger could face forward for take off and landing; and swivel the seat into one position in order to work or eat at a table, and to another position when the seat was converted into a bed. The swivelling seat was made possible because the aircraft in which it was installed had wide bodies. Acumen designed this seat as well. American Airlines also patented its seat and seating system. Again, I will revert to the details of this later.
7. Then came the turn of business class passengers. Once again BA led the way. Both Virgin Atlantic and BA had been working on a new seat for business class passengers, and both were put into service at about the same time in 2000. Virgin Atlantic’s seat was known as J2000. The seats were arranged in conventional rows and columns. Although the J2000 provided a bed, it did so at a slight tilt; and was in the nature of a reclining seat. The foot of the bed had to be partially accommodated under the seat of the passenger in front. The J2000 was a moderate commercial success, in that Virgin Atlantic used it itself, and also licensed its use to other airlines; but it was eclipsed by BA’s new offering.
8. BA’s new offering was nick-named the Yin-Yang seat. It was designed by a team led by Professor Darbyshire, who gave evidence in this case as one of Contour’s experts. It had interlocking seats in a head-to-toe formation; one passenger sitting and sleeping next to the aisle and the other sitting and sleeping next to the window. One of the two passengers faced forwards; and the other faced backwards. This arrangement of seats provided good density of accommodation. However, it had its drawbacks. The passenger in the seat further from the aisle had to climb over the other passenger to get in and out of his seat; and many passengers did not like the feeling of travelling backwards. It, too, was patented.

### **Aircraft seat design**

9. As Mr Meade put it in opening (and as is common ground) designing new aircraft cabin layouts is an extremely complex business. It involves juggling a very large number of factors in a very constrained environment. Even a difference of inches can

be significant. Thus aircraft cabin design is a very intricate balancing act; it is difficult and time consuming.

10. The parameters within which a designer of aircraft seating must work were largely agreed. Much of what follows is also agreed as being part of the common general knowledge for the purposes of construing the 908 patent and for deciding whether its inventive concept was obvious.
11. First there are regulatory constraints. Professor Darbyshire and Mr Dryburgh detailed them:
  - i) The seat must pass a number of dynamic tests including 16g forward tests, a 9g downwards test and the HIC (Head Impact Criteria) test, which mean that the seat as a whole (that is the seat and all its fittings) must pass tests for structural integrity and that the seat as a whole must meet tests for passenger safety;
  - ii) The fore and aft aisles must be at least 15” wide from ground level up to a height 25” from the floor and from 25” from the floor and above, the aisle must be at least 20” wide. Most designers will incorporate a design tolerance of 0.5” to these requirements;
  - iii) For taxi, take off and landing (“TTOL”), the crew must have a view of all the passengers when seated. This does not necessarily have to be by direct line of sight but can be by the use of video cameras, or mirrors;
  - iv) The seat positions must be aligned with the positions of the oxygen masks. In relation to a flat-bed seat, this means that in many cases a passenger must be able to reach the oxygen mask from a fully reclined position;
  - v) If the seats are installed at an angle greater than 18° to the longitudinal axis of the aircraft additional safety restraints (such as a three point harness like a car seatbelt as opposed to the more normal lap belt) must be provided;
  - vi) There must be sufficient space for the circulation of air in case of decompression, and space left for decompression ducts;
  - vii) The height of the seat shell must not exceed 48”; and
  - viii) The selection and location of materials within the aircraft are very restricted, because they must be fire resistant and easy to clean.
12. Second, there are constraints imposed by the aircraft itself. These include the cabin width; the location of the seat tracks; the location of doorways, monuments (fixed installations such as galleys, lavatories etc.), and so on. They are less important in the context of this case, because the seats and seating systems in issue were designed for the same (or similar) aircraft. The word “monument” is used by some people in the aircraft design world in a wider sense, to denote anything fixed within an aircraft cabin that is not a seat. In the wider sense the word thus includes things like bulkheads and partitions. An aircraft cabin is also notionally divided into zones.

Typically zone A is the nosecone and used for first class seats, while zone B is used for business class.

13. Third, there are constraints imposed by the brief of the particular airline commissioning the design. The most important of these is the number of passengers that the airline wishes to accommodate in business class (“the pax count”). There are others as well, such as the size and quality of the in-flight entertainment systems (IFE). In addition airlines are concerned about the weight of seats and seating systems, so a good design will be as light as possible.
14. Lastly, there are constraints imposed by the fact that the seat must work for a human being. Thus, as Professor Darbyshire explains:
  - i) the size and shape of the passenger dictates among other things that the seat height must be a minimum of about 16.5” to 17.5” and no more than 19” in height;
  - ii) the seat must move smoothly through a range of seated and reclined positions to deliver comfort (the kinematic path);
  - iii) a desire for privacy must be balanced against a feeling of claustrophobia;
  - iv) the seat must be accessible; and
  - v) useable features of the seat and surrounding shell must be conveniently located (i.e. the table, light, monitor, handset, etc).

#### **The process of designing a new seat: an overview**

15. Since the airline industry is highly competitive, all airlines are constantly looking at their competitors’ offerings. One of the most important parts of the offering for business class passengers is the Passenger Accommodation Unit (PAU). So, typically, an airline will analyse the product of its closest competitor and try to make its own product better. One of the first steps is to make a copy of the competitor’s Layout of Passenger Area (LOPA). In the case of BA the LOPA for each of its aircraft is available on its website. The same applies to other airlines too. From this and other information an airline can study its competitor’s PAU. It will also take photographs and make slides of the competing product. Airline staff and their consultants will also fly on rival airlines and, within the constraints imposed by the presence of cabin crew, will take measurements of their rival’s PAU. These measurements can be quite detailed, including for example the angle of the seat pans, and the width of the seat. It will list the features of a competing PAU as a check list; and will, no doubt, add its own “wish list” of desirable features. One of the processes will be an overlay of any new seat design over its nearest rivals, in order to see what effect a new seat will have on the use of space within the cabin and hence on the number of seats that can be accommodated. Mr Moreno, Virgin Atlantic’s expert, said in his report that if he had been asked to design a new flat-bed business class seat in 2001 his first step would have been to review the seats that were already on the market and assess their advantages and disadvantages.

16. The idea of a herringbone arrangement of seats had been around for some time. In pure design terms both an inward facing herringbone and an outward facing herringbone were known. An inward facing herringbone gave the potential for greater seat density. This is because the seats can be angled more acutely, and because access from the aisle into the seat is more efficient if passengers do not have to climb over or round the seat back. Its drawback was that passengers faced each other across the aisle, thus reducing their individual privacy. An outward facing herringbone, on the other hand, gave the passengers greater privacy, but was space-hungrier. Until the advent of the UCS the perception in the industry was that passengers would not like an inward facing herringbone. Since the passengers are the economic drivers, inward facing herringbones remained in the realm of theory. This is borne out by Acumen's experience. They have worked on (or are working on) some twelve herringbone layouts. All, with the exception of Solar Eclipse and its derivatives, are outward facing. At the time of the events in issue Virgin Atlantic's UCS was the only inward facing herringbone that had actually been commercialised.
17. Mr McKeever was the lead designer for Acumen on the Rock project. His general account of the design process was as follows. The starting point for a seat design is to create the LOPA. In creating a LOPA the designer is not simply working in plan. He must take account of the curvature of the aircraft walls and must establish the distance that must be left between the seat and the sidewall of the aircraft in order for the seat mechanism to operate efficiently. The design process operates in stages, which Mr McKeever described as follows:
- i) Stage 1: determine the dimensions of the seat or bed.
  - ii) Stage 2: The minimum bed dimension is laid out in the aircraft LOPA to fit as many passenger places as possible. There are a number of key dimensions. Some are fixed, such as the width of the aircraft. Others are variable within limits, such as the aisle width. Acumen normally work to an aisle width of 20". One advantage of this is that it gives the designer much greater freedom of design in relation to the privacy screen. The designer will subtract twice the aisle width from the aircraft width (because there are two aisles) and the result is the space left for the beds. If the seating configuration is 1-2-1 (i.e. one passenger in each column adjacent to a sidewall of the aircraft, and two passengers in the middle) then the space left for the seats is divided by four. That dimension is the space within which the seats must be fitted.
  - iii) Stage 3: The minimum dimension plan shapes are laid out in the most space efficient layout; for example a herringbone layout for a bed seat. This layout uses bed blocks, which is the shape of the bed in its extended position. There is some freedom of choice for the angle of installation of the bed blocks, but since the object of the exercise is to pack as many seats as possible into a tight space, the freedom of choice is limited. A gap is left between each bed to allow for some structure and privacy screens. With rectangular bed blocks this may lead to clashes with the minimum legal aisle width; the aircraft sidewall and clashes between beds down the centre line of the aircraft. The layout is likely to be designed for the most constricted part of the cabin first, which in many cases will be the central columns of seats rather than the outboard seats.



- iv) Stage 4: The corners of each bed are removed to avoid clashes with the minimum legal aisle width, the sidewall of the aircraft and each bed positioned down the centre line. Typically this results in rounded corners or asymmetric shapes. At this or the preceding stage the designer must also consider the position of the seat within the bed block. This is likely to be determined by the seat mechanism. The seat should be positioned as close to the sidewall of the aircraft as possible, but must avoid the seat back hitting the sidewall of the aircraft when fully reclined.
  - v) Stage 5: Seat structure is added in the space between each bed to give some privacy between passengers and house all the seat components such as meal tables, monitors, IFE equipment, etc.
  - vi) Stage 6: A final aircraft LOPA is prepared showing further refinement to the bed plan shape, privacy screens and seat structure to give a more appealing integrated aesthetic, whilst maintaining minimum bed dimensions. The gaps left at the front and rear of the cabin are filled in with appropriate cabin furniture. The aim is to use all the available space as efficiently as possible because for any given cabin class the airline will wish to have the maximum number of paying passengers accommodated.
18. This is the process which Mr McKeever says that Acumen followed in designing the Rock seat which eventually became the Solar Eclipse. One of the principal factual issues is whether this was indeed the process that was followed in designing the Rock seat and its later iterations.

### **Unregistered design right**

#### *The statutory provisions*

19. Section 213 of the Copyright Designs and Patents Act 1988 provides, so far as material:
- “(1) Design right is a property right which subsists in accordance with this Part in an original design.
  - (2) In this Part “design” means the design of any aspect of the shape or configuration (whether internal or external) of the whole or part of an article.
  - (3) Design right does not subsist in—
    - (a) a method or principle of construction,
    - (b) features of shape or configuration of an article which—
      - (i) enable the article to be connected to, or placed in, around or against, another article so that either article may perform its function, or

- (ii) are dependent upon the appearance of another article of which the article is intended by the designer to form an integral part, or
- (c) surface decoration.
- (4) A design is not “original” for the purposes of this Part if it is commonplace in the design field in question at the time of its creation.”
20. As many judges have commented, section 213 is notoriously difficult to understand. As Jacob LJ put it in *Dyson v Qualtex* [2006] RPC 31 § 14: “It has the merit of being short. It has no other.”
21. A person who is entitled to unregistered design right has the exclusive right to reproduce the design for commercial purposes by making articles to that design or by making a document recording the design: 1988 Act s. 226 (1). Section 226 (3) provides:
- “Reproduction of a design by making articles to the design means copying the design so as to produce articles exactly or substantially to that design...”
22. The word “article” is not further defined, but section 260 (1) provides:
- “The provisions of this Part apply in relation to a kit, that is, a complete or substantially complete set of components intended to be assembled into an article, as they apply in relation to the assembled article.”
23. Thus as Mummery LJ explained in *Farmers Build Ltd v Carrier Bulk Handling Materials Ltd* [1999] RPC 461, 480:
- “The purpose of copyright and of design right is not to protect the “novelty” of the work against all competition; it is to provide limited protection against unfair misappropriation of the time, skill and effort expended by the author of design on the creation of his work.”

*What is a design?*

24. In *Rolawn Ltd v Turfmech Machinery* [2008] RPC 27 § 79 Mann J pointed out that:
- “It is important to isolate the design in respect of which protection can be properly claimed, and it is vital to ensure that it falls within the definition of design. The Act defines design as “any aspect of the shape or configuration ... of the whole or any part of an article”, and the right cannot exist until there is an embodiment of the design in an article or in a design document. This combination of features means that design right is confined to what one can actually see in an article - either the physical article or a drawing.”

25. Design right does not therefore protect ideas. Ideas are protected by patent law. It follows, therefore, that Virgin Atlantic are not entitled to claim design right for the general concept of an inward facing herringbone arrangement of seats: *Kleeneze Ltd v DRG (UK) Ltd* [1984] FSR 399. Mr Meade accepted this as a matter of law (at least at this level in the judicial hierarchy) and confirmed that he was not putting Virgin Atlantic's case on that basis. Nor, I think, does Virgin Atlantic claim design right in the general concept of an inward facing herringbone where the angle of installation of the seats exceeds 18°.

*What is an aspect of the shape or configuration of an article?*

26. It is, of course, plain from the words of section 213 itself that design right can be claimed for the design of part of an article. A teapot spout or a teapot handle are frequently cited examples. An aspect of the design is something that is discernable or recognisable (not necessarily to the naked eye) but it need not be visually significant: *A Fulton Co Ltd v Totes Isotoner (UK) Ltd* [2004] RPC 16, § 31.

*Self-selection*

27. One of the real difficulties of section 213 is that the claimant may select a part of the article and claim design right for that part only. The courts have recognised this possibility since the early days of design right. In *Ocular Sciences Ltd v Aspect Vision Care* [1997] R.P.C. 289, 422 Laddie J said:

“...the proprietor can trim his design right claim to most closely match what he believes the defendant to have taken. The defendant will not know in what the alleged monopoly resides until the letter before action, or, more usually, the service of the statement of claim. This means that a plaintiff's pleading has particular importance. It not only puts forward the claim but is likely to be the only statement of what is asserted to be the design right.”

28. Unregistered design right is, of course, not a true monopoly: it merely prevents copying. But otherwise that statement of the law is correct, subject to the gloss given by Jacob LJ in *A Fulton Co Ltd v Totes Isotoner (UK) Ltd* [2004] RPC 16, § 34:

“I do not fully go along with Laddie J.'s suggestion that what the proprietor can do is to “trim his design right claim”. It is not really a question of “trimming”—it is just identifying the part of his overall design which he claims has been taken exactly or substantially. And although Laddie J. was right in saying that the defendant will not know in what the alleged (my emphasis) monopoly resides until the letter before action or the claim form, that does not mean the defendant does not know where he stands before then. The man who copies a part of an article, exactly or substantially, will know what he has taken. It is true that it will be for the designer to formulate his claim properly in any proceedings, but the subsistence of his rights does not depend on how he frames his claim.”

29. In a sense it is of course true that a man who copies part of an article will know what he has taken. But similarities between the design relied on and the allegedly infringing article are often relied on to raise the inference of copying which the defendant must then rebut. There is a danger that the ability of the claimant to select parts of his design which are small in comparison to the overall article will give rise to a distorted impression of what the defendant has done which comes close to reversing the burden of proof. This concentration on relatively minor aspects of the overall design also had a tendency to make some of the witnesses more defensive than they might otherwise have been. There is another point to be made here. Virgin Atlantic's pleaded case did not rely on designs as recorded in design documents. Rather they relied upon the designs as embodied in the actual UCS. As it was put in the pleading:

“Insofar as there are any identifiable difference between the design drawings herein referred to and the Designs as embodied in the earliest commercially available UCS seating system the Claimant relies on the latter.”

30. Thus what is alleged to have been copied is the real life version of the UCS; and what is being compared is the real life version of the UCS with the real life version of Solar Eclipse. This is important because the plans, elevations, and isometric drawings, being only two dimensional, can give a distorted picture of reality.

#### *Reproduction*

31. What must be established is that the design in which design right subsists has been copied so as to produce “articles exactly or substantially to that design”. Two points arise. First, although the Act allows design right to subsist in (and be claimed for) *part* of an article, the definition of reproduction speaks only of making “articles”. There is, therefore, a linguistic mismatch between subsistence of design right and the right that it confers. But it must obviously have been Parliament's intention that if design right subsisted in part of an article (e.g. the teapot spout) the right would be infringed by incorporating a copy of that spout in another teapot, even if the infringing spout is not itself a whole article. Second, even if the design has been copied, the infringing article must be produced “exactly or substantially” to the copied design. Mere similarity is not enough.
32. In *C & H Engineering v F Klucznik & Sons Ltd* [1992] FSR 421 Aldous J said:

“Under section 226 there will only be infringement if the design is copied so as to produce articles exactly or substantially to the design. Thus the test for infringement requires the alleged infringing article or articles be compared with the document or article embodying the design. Thereafter the court must decide whether copying took place and, if so, whether the alleged infringing article is made exactly to the design or substantially to that design. Whether or not the alleged infringing article is made substantially to the plaintiff's design must be an objective test to be decided through the eyes of the person to whom the design is directed.”

33. Although, at least in theory, two separate criteria must be satisfied viz. copying and making articles exactly or substantially to the copied design, it is not easy to conceive of real facts (absent an incompetent copyist) in which a design is copied without the copy being made exactly or substantially to the copied design. In practice, if copying is established, it is highly likely that the infringing article will have been made exactly or substantially to the protected design. If copying is not established, then whether the article is the same or substantially the same as the protected design does not matter. However, similarity in design may allow an inference of copying to be drawn.

### **Copying: the approach to the evidence**

34. I find helpful the observations of Lord Millett in *Designers Guild Ltd v Russell Williams* [2000] 1 WLR 2416, 2425 considering the question of copying in relation to an artistic work:

“The first step in an action for infringement of artistic copyright is to identify those features of the defendant's design which the plaintiff alleges have been copied from the copyright work. The court undertakes a visual comparison of the two designs, noting the similarities and the differences. The purpose of the examination is not to see whether the overall appearance of the two designs is similar, but to judge whether the particular similarities relied on are sufficiently close, numerous or extensive to be more likely to be the result of copying than of coincidence. It is at this stage that similarities may be disregarded because they are commonplace, unoriginal, or consist of general ideas. If the plaintiff demonstrates sufficient similarity, not in the works as a whole but in the features which he alleges have been copied, and establishes that the defendant had prior access to the copyright work, the burden passes to the defendant to satisfy the judge that, despite the similarities, they did not result from copying.

Even at this stage, therefore, the inquiry is directed to the similarities rather than the differences. This is not to say that the differences are unimportant. They may indicate an independent source and so rebut any inference of copying. But differences in the overall appearance of the two works due to the presence of features of the defendant's work about which no complaint is made are not material. In the present case the disposition of the flowers and (except in one instance) the colourways of the defendant's design are very different from those of the plaintiff's design. They were not taken from the copyright work, and the plaintiffs make no complaint in respect of them. They make a significant difference to the overall appearance of the design. But this is not material where the complaint is of infringement of copyright and not passing off.”

35. Nevertheless it is also important to bear in mind Mummery LJ's warnings in *Farmers Build* (at 481 and 482):

“Substantial similarity of design might well give rise to a suspicion and an allegation of copying in cases where substantial similarity was often not the result of copying but an inevitable consequence of the functional nature of the design. ...Copying may be inferred from proof of access to the protected work, coupled with substantial similarity. This may lead to unfounded infringement claims in the case of functional works, which are usually bound to be substantially similar to one another.

...[The court] must not forget that, in the field of designs of functional articles, one design may be very similar to, or even identical with, another design and yet not be a copy: it may be an original and independent shape and configuration coincidentally the same or similar.”

36. However, as in any case where there are factual presumptions and shifting evidential burdens, the question of copying is in the end a question of fact; and one which must be proved by the claimant on the balance of probabilities.
37. In considering the question of copying the function of the experts is not to evaluate the factual evidence, but to point out to the court the similarities and differences between the design and the alleged infringement; and the significance of those similarities and differences, so that the court can come to a view on whether they are such as to lead to a rebuttable inference that the defendant has copied the claimant’s design. Both sides of the equation are important. An expert ought to deal both with the similarities between the design and the alleged infringement and also with the differences. To concentrate on the similarities alone or on the differences alone gives an unbalanced view.

### **Did Acumen or Contour copy UCS?**

38. The Defence served by Contour originally pleaded a “clean room” defence: that is to say that the designers of Rock and Solar Eclipse were completely different from the designers of UCS and that the design data generated during the design of UCS were kept securely on a separate part of Contour’s server. In short the defence was that the designers of Rock and Solar Eclipse had no access to UCS and therefore could not have copied the designs. That pleaded defence had to be abandoned in the light of disclosure of documents. The position as it eventually emerged was rather more complex. First, there are at least two kinds of design data. Design data known as CATIA, which are three dimensional modelling data, are stored in a digital file. It can be sent to a manufacturer who can use the file to make a mould or tool in order to manufacture the required component. These data can be kept securely. In addition there are two-dimensional design drawings. These could not be kept securely once UCS had gone into production in the autumn of 2003. Second, once Virgin Atlantic had entered into a licence with Air New Zealand in about June 2004, the UCS had to be modified in order to fit onto Air New Zealand’s aircraft. A separate design team was created in order to deal with those modifications. That design team (as well as the original design team) had access to the UCS design data (including CATIA). Third, contrary to the pleaded case there were at least two people at Contour (Simon Allen and Bruce Gentry) who had roles to play both in UCS and Rock/Solar Eclipse.

Indeed, since Contour employ a large number of short term contract designers, it has not been possible to identify all the designers and engineers who worked on the UCS project, or whether some of those short term contract staff worked on other projects within Contour. Accordingly, Contour now admit that their relevant employees had the opportunity to copy both UCS itself and also UCS design data. That admission does not, however, answer the question: did they take that opportunity?

39. Contour also admit that they made various copies of LOPAs and/or UCS design drawing data during the development period of the Solar Eclipse, but deny that any such copies were used for the purpose of designing and/or manufacturing the Solar Eclipse seat and/or seat system. As Contour's engineering director, Mr Higgins, put it in his evidence, there were "references from time to time" to the UCS and the UCS design data. Some of the witnesses did, in my judgment, downplay the extent to which these references were made. At some stages of his evidence Mr Dryburgh said that Acumen had little knowledge of UCS and that Solar Eclipse would have been designed in exactly the same way even if UCS had never existed. This extreme position is not maintainable and Mr Dryburgh did not, in the end, maintain it. As he accepted (and as is common ground) the development of any new seat will look at the "best in breed" and at the time when the Rock project began UCS was at least one of the best in breed. Moreover, it is plain (as the narrative will reveal) that Cathay Pacific wanted to compete with both BA and Virgin Atlantic; and specifically asked for a Virgin fishbone layout.

40. However, Mr Higgins denied copying. As he put it in answer to Mr Meade:

"Q. ...Because your company and Acumen were under extreme time pressure in May 2004, and because of the strong direction from Cathay to look at Virgin and in particular the LOPA, a seat was produced for the June presentation which was firmly and strongly based on the Virgin seat design in order to try and get Cathay's business. That is my suggestion to you and I am inviting you to comment on it?"

A. I would disagree, we started from a different fundamental start point, which was to use our existing Eclipse seat that Cathay already had, allow it to go down flat and, you know, the mock-up a very early conception, had very little refinement to it, and the finished product looks [a] little like the mock-up anyway. You know, this is what happens. All it can be judged by is maybe spatial arrangement."

41. I have put "a" in square brackets because I believe that it was a transcription error. His evidence was that they started from scratch with an inward facing herringbone to provide the Eclipse seat and built screens, ottomans and cocktail tables around it.

42. Mr Dryburgh was adamant in his evidence that Acumen did not copy UCS. He referred several times to Acumen's professional integrity which, he said, required original thinking rather than copying. He accepted that the design team familiarised themselves with UCS, because that was one of the benchmarks against which their own design would have to compete. He said that a "Virgin style" layout was simply a generic term for an inward facing herringbone, and did not mean that the design team

copied Virgin Atlantic's layout. Although the design team looked at Virgin Atlantic's layout, there were good and bad points to it; and they did not adopt or copy it. As Mr Dryburgh explained:

“From our point of view, the Virgin product has a great many compromises, from our standpoint. This is the reason it was not a reference point. For example, if you take the table out, you are trapped in your seat position. The egress and access is very limited. Frankly for Air Canada it is a non-starter, because you cannot run a trolley service for catering because the aisles are too narrow. The drivers for our project for Air Canada, the fundamentals of the drivers if you like, was such that it was actually fallacious to return to Virgin as a reference, because that product did not generate the right aisle width to offer a trolley service.”

43. He said that the deficiencies in UCS were such that it was not a good reference point and that Acumen started from the ground up and designed in the way that they knew how. That said, Mr Dryburgh accepted that Acumen looked at the “best of breed” in the market; and that included not only UCS but also its competitors. As he put it:

“We would not be doing our job if we did not understand what is out there and make a critical appraisal of what is out there so that we do not make the same mistakes. That is a natural starting point.”

44. Mr McKeever, as the lead designer of Rock/Solar Eclipse, also said that he did not copy the UCS. As he put it in his oral evidence:

“We are a very successful company. We have delivered more products probably than any other design company that is flying today. Why would we look to copy somebody else? It would just be the ruin of our reputation.”

45. However, these general statements need to be tested against the details. Mr Meade launched a full scale assault on both the accuracy and veracity of the Acumen witnesses; and in particular that of Mr McKeever. In his final submissions he described Mr McKeever's evidence as worthless, riddled with inconsistencies, and in certain respects simply dishonest. There is no doubt that Mr Meade's cross-examination of Mr McKeever was very effective and it did expose some inconsistencies and weaknesses in his evidence. I have therefore considered with care whether I should reject his evidence wholesale. I have concluded that I should not, and in reaching that conclusion I have taken into account the following (among other) factors:

- i) Much of the thrust of the attack on Mr McKeever was that he had underplayed or concealed the nature of the use that he made of design data and LOPAs that were supplied to him and that he must have been supplied with more data than he admitted. But Acumen (despite not being party to the action) gave full disclosure of their documents. No criticism has been made of their disclosure. That is not the action of a company with something to hide.



- ii) Mr McKeever went further in his witness statement and referred to a LOPA that had not been produced on disclosure which was a fundamental part of Virgin Atlantic's case. A copy of it was in fact found (not in the possession of either Mr McKeever or Acumen) during the course of the trial. Mr McKeever's reference to this document at a time when he believed that it had been lost was not the action of someone with something to hide.
  - iii) Mr McKeever answered questions directly and without evasion.
  - iv) The events about which he was giving evidence took place some years ago, and it is not altogether surprising that his detailed recollection of individual points in the overall design process was sometimes inaccurate.
  - v) Although there were some parts of his evidence that were unconvincing, he was, in my judgment, inaccurately reconstructing what with hindsight he thought must have happened rather than deliberately attempting to mislead the court.
  - vi) Even if I am wrong about that, the fact that a witness tells lies about one thing does not mean that he tells lies about everything. That is why juries are given the standard *Lucas* direction.
46. As I have said, Mr Dryburgh did not maintain the extreme position that Solar Eclipse would have evolved in exactly the same way if UCS had never existed. But that does not lead me to the conclusion that overall he was an unsatisfactory witness (as Mr Meade suggests). He was, to be sure, defensive; but that was because his integrity (and that of his company) was under sustained attack. His demeanour in the witness box struck me as a witness doing his best to tell the truth as he saw it.

### **The expert witnesses on design**

#### *Mr Moreno*

47. Mr Moreno was Virgin Atlantic's expert witness on issues relating both to the patent and to design. Mr Moreno is a designer who has had some experience of aircraft seating design, though he came to that area relatively recently. His company has designed and created two mock-ups for first class seating, and has designed an economy seat which will be released in 2009. Apart from that he has made one unsuccessful pitch to produce a business class seat; and he has lectured about business class aviation. I did not consider that his practical knowledge of the design of aircraft seating was equal to that of Professor Darbyshire. Mr Moreno said in cross-examination that he understood his function on the design right part of the case to be that of pointing out similarities between the UCS and Solar Eclipse and to disregard any differences between them. This, I fear, was a misunderstanding of his role as an expert, which was to look at both similarities and differences, and to come to a conclusion, based on both the similarities and the differences whether those similarities and differences led to an inference that one design had been copied from the other. There were other flaws in his approach. First, he discounted any design constraints imposed by the client's brief. While it is true that the requirements of a brief which ineluctably lead to copying provide no defence; in a case where it is not suggested that the general concept is one that is protected by design right those

constraints must be taken into account to some extent. In the present case Acumen's eventual brief was to design an inward facing herringbone. Mr Moreno considered, in my judgment wrongly, that that, in itself, was some evidence of copying. Second, and following on from this point, his approach was that a designer should be as creative as possible; so that he tended to think that a design choice of a conventional way of designing something was itself evidence of copying. As he put it in his oral evidence:

"I do not understand what you want to get with the conventional approach. We are creative people. We are designers. And I would say nothing should be conventional in the way we come up with new solutions."

48. In short, in my judgment he set the bar too high.

*Professor Darbyshire*

49. Professor Darbyshire was Contour's expert on matters relating to design. As I have already said, he was the leader of the team that designed BA's Yin-Yang seat and was a judge of the Design Week award won by UCS in 2004. He is a distinguished designer with great practical experience. He was also a most impressive witness. His answers to questions in cross-examination were cogent and clear, and displayed profound knowledge of the practicalities of aircraft seating design.

50. Professor Darbyshire summarised his conclusion thus:

"My belief here is that no copying has taken place because of the number of differences that I can see and because the two seats clearly occupy a very different footprint on the aircraft and are designed for very different aircraft."

51. So far as the inward facing herringbone was concerned he said:

"Because the herringbone format I think is a fairly obvious path to follow if you want to deliver a lay flat bed in a relatively efficient manner on an aircraft where you are not overlapping one part of the body of one person with the part of the body of another. In looking at the screen that divides one person from another, you can identify a considerable number of differences between one and the other that would prevent me from considering them to have been copied."

52. Professor Darbyshire commented on the differences between the articles in the real world and their representation in the drawings. He said:

"...looking at the articles themselves, there are substantial differences in viewing the articles themselves that one cannot directly interpret through these drawings. For example, the Virgin privacy screen has a three-dimensional curve to it, so when you section it in the vertical manner it is a very different creature from that of the Solar Eclipse."

53. I accept this evidence. Professor Darbyshire also made another general point which seemed to me to be cogent. In the case of an intricate product such as an aircraft seating system, the elements to be manipulated (the seat mechanism, the IFE system, the side table and so on) will drive the form of the finished product. The final design is more likely to be harmed than helped by the copying of someone else's design data, especially if they are design data that relate to only a small part of the overall design.

### **The development of the UCS seat**

54. In early 2000 Virgin Atlantic began the development of what was to become the UCS seat. It knew that its main competitors were the BA First seating unit and the Yin-Yang seat. It was losing business to BA. It knew that it had to provide a flat-bed seat in order to compete. Virgin Atlantic completed a Design Business Case on 15 May 2000; and a Technical Specification by December 2000. Within Virgin Atlantic the project was mostly referred to as "Chanel", although it had other names as well. On 16 February 2001 Design Q (a design consultancy) gave a presentation to Virgin Atlantic on the UCS; and following that presentation LOPAs were produced showing various different alternatives for possible layouts. Various options were being considered at that stage, including an inward herringbone layout with no ottoman (Chanel No 5a), an angled "yin yang" type configuration (Chanel No 5c), a front and back facing side-by-side arrangement (Chanel No 5d), and a suite type arrangement (Chanel No 4b). Virgin Atlantic originally feared that passengers would not like an inward facing herringbone because of the loss of privacy; but their market research suggested that the fear was unfounded.
55. Development continued during the period between February 2001 and April 2002. In June 2001 the fine details of the UCS cabin layout were worked on. Although those plans explored the way in which the seats would be laid out in some detail, the PAU design was not considered in such detail at that stage.
56. On 9 August 2001 Virgin Atlantic filed their first priority document for the 908 patent.
57. In October 2001 Pearson Lloyd (another design consultancy) prepared foam mock-ups and 3D CAD visualisations. In the first of those visualisations the inward herringbone is apparent, and the accelerated curve of the ottoman is also present. There was no ottoman backshield used. The privacy screens for both the central and wall PAUs incorporated one continuous low section with a higher central section. A translucent "visor" was attached to the higher section in order to provide further privacy between passengers. The privacy screens were retractable along the curve of the chair shell. The ottoman swivelled in order to change from an ottoman to a buddy seat and vice versa. The foam mockups were similar. The designers also experimented with the shape of the retractable privacy screen, using a "visor" type screen as shown in the 3D visualisations as well as a fuller sliding screen.
58. Pearson Lloyd continued their development work, and produced a further presentation document dated 26 October 2001. They had experimented with the various design possibilities for the shape of the ottoman. The privacy screen still followed the formula of using a long lower section with a higher section only around the back of the seat unit. By November 2001 Softroom (yet another design consultancy) had produced a computer generated image of a proposed bar area which showed what the

UCS design by that stage looked like. By this stage a curved backshield had been added to the ottomans. The height of that shield remained constant rather than curving down towards the floor of the cabin as the shield wrapped around the ottoman. The privacy screens also remained at constant height but curved very sharply down to the floor at their edge. Rather than the two level privacy screen in the Pearson Lloyd presentations the screen remained at full height along almost its entire length. The privacy screen and ottoman backshield were therefore at two almost constant and discrete heights.

59. On 23 November 2001, Pearson Lloyd produced a document entitled “Completion of Design Concept”. I was also shown a Virgin Atlantic presentation dated 19 December 2001. This contained a description of a number of desirable features of the latest design. It also contained overlays and photographs comparing the design with the J2000, BA First and BA Yin-Yang. This kind of comparative exercise is standard practice. While development of the designs was continuing Virgin Atlantic commissioned market research from among its highest spending customers. The results were reported in February 2002. The overwhelming message was that the BA flat bed seat was the benchmark; and that Virgin Atlantic would have to match it in order to stand any chance of reversing the decline in its market share among business class passengers.
60. The Business Case was presented to the Virgin Atlantic Board in March 2002, following which the UCS seat moved into the manufacturing phase. Virgin Atlantic chose Contour as the manufacturer in March or April 2002, largely because of its extensive experience in manufacturing premium seats, and on 25 April 2002 Contour signed a confidentiality agreement in relation to the project.
61. In May 2002 a team from Contour went to Virgin Atlantic’s offices in Crawley. They were shown a full working mock-up of the proposed new seat. The mock-up had some outboard and centre suites in a B747 B zone mock-up cabin. One of the suites had a functioning seat mechanism, but none of the other features (cocktail table, handset cradle etc) were actually working. The Contour team was also provided with a detailed outline of the proposed specification, LOPAs and each item to be incorporated in the seat. They were told that the UCS would have two embodiments. A 40° angled version of the seat would be installed in zones A and B of the main deck of the B747s and a 49° angled version of the seat would be used on the B747 Upper Deck and on the A340-600. The 49° embodiment was to be used where the aircraft or the particular zone of the aircraft was narrower than the main deck of the B747.
62. In June 2002 Virgin Atlantic confirmed Contour’s appointment to design engineer and manufacture the new seat. Within Contour the commission was christened “Project Malcolm”. Virgin Atlantic supplied Contour with 3D surface data for the exterior surfaces of the UCS seat and surrounding furniture for the 40° B747 installation. The data supplied did not convert well to the software that Contour used; so some of it had to be recreated. But that was not a difficult task. On 27 June 2002 Virgin Atlantic also supplied Contour with a Technical and Ambition Specification, which was marked “Private & Confidential”. That set out the aesthetic requirements of the seat rather than the practical design engineering and manufacturing requirements.

63. Within Contour Mr Mark Davies was the lead engineer and in charge of Project Malcolm, although formally he reported to Mr Bruce Gentry. From the very start the team was made aware that the project was to be kept confidential. Each member of the Project Malcolm team was required to sign a one page confidentiality agreement. At the beginning of the project the team was also assigned to a separate building from the rest of the Contour employees at Contour's premises in Camberley. A building which had previously been used for the galley division of Contour and the personnel department was allocated solely to Project Malcolm. The building was kept locked and each team member was given a key. The CAD drawings and data which they worked on and generated were kept on a secure part of Contour's computer system that could only be accessed by authorized team members. These security measures changed later. The first change was in July 2003 when the design team moved from their dedicated facility to new offices which housed other design teams as well. The second change took place when UCS was publicly launched in November 2003. At that stage the 2-D drawings were placed in Contour's digital library and restrictions on access to them were lifted. The restrictions remained in place as regards the 3-D modelling data.
64. The team began work on Project Malcolm in June 2002. Initially, the team consisted of Mr Davies, Mr Simon Allen, Mr Dan Buckley and Mr Andy McDonald. Each of them worked on a different aspect of the design. It soon became clear to Mr Davies that this manpower was not enough. Accordingly, some of Contour's permanent staff were transferred to Project Malcolm and more people were brought in on a contract basis to work specifically on the project. Mr Bruce Gentry was additionally involved in Project Malcolm in his capacity as the Civil Aviation Authority signatory at Camberley. His role was to sign off all drawings for Project Malcolm in order to obtain regulatory approval from the CAA. This required him to understand the designs in order to satisfy himself that they were worthy of manufacture at least for the purposes of testing. Although Mr Gentry was also Mr Davies' line manager, in practice Mr Davies was in day to day charge of the design project, both before and after the design team moved offices. An e-mail from Contour to Virgin Atlantic which suggested that there was some substantive change in the management of the team at the time of the office move was little more than window dressing. Over the course of Project Malcolm over forty engineers were involved, although only a few of them were on Contour's permanent staff.
65. In May 2003 a number of Contour employees (including Mr Gentry and Mr Davies) attended a brainstorming session at Contour's premises in Cwmbran. This session was not related to any particular project. The purpose of the session was to come up with new ideas. One of the ideas that Mr Gentry came up with was an inward facing herringbone layout for business class; and he recorded that in a LOPA.
66. On 16 June 2003 Virgin Atlantic and Contour entered into General Terms of Agreement.
67. Mr John Higgins was the Engineering Director at the time of Project Malcolm. He was responsible for ensuring that the project had sufficient resources; and, as engineering director, he became involved in some engineering issues, such as issues with the electrical control unit for the actuation systems and the attachment of the seats to the plinth. He did not, however, produce any design drawings, although he would have had access to the 2-D drawings. He did not have access to the 3-D

modelling data. Nevertheless his role as engineering director meant that he did get to know the UCS seat and seating system in the latter stages of the project. He would have been able to describe the product as a product and the way that it worked; and the features of the product, as well as weights, the dimensions of the bed and the concept of the plinth.

68. Virgin Atlantic had put a lot of work into the external appearance of the UCS before engaging Contour. Virgin Atlantic's instruction to Contour was that the design team was to achieve the aesthetic described in the Ambition Specification, with minimal changes to the aesthetic design or surface data. However, they had not provided Contour with any internal elements of the design and the design team discovered that the geometry had not been fully worked through, particularly since there were to be two embodiments at different angles. In addition, the seat was to be used on two different aircraft (the Airbus A340-600 and the Boeing 747) which have different configurations.
69. Accordingly, as the Project Malcolm team worked up the design, a number of changes had to be made. Mr Davies gives an account of these in his witness statement. They included: reshaping the ottoman for the 49° version; relocating the lifevest compartment in the ottoman; changing the location of the light on the ottoman; modifying the height of the ottoman backshield; adding a padded section to the privacy screen; providing for decompression grilles; introducing a plinth to which the seating unit would be attached, and relocating the reading lights. Some of these changes were, of course, more important than others, but overall Mr Davies said that they were minor changes. Mr Simon Allen was the engineer who did most of the detailed work on the LOPAs and he also described these design changes in his witness statement.
70. Mr Davies said that there were four particular features of the UCS seat which differentiated it from what he had seen before. First, it was intended to be located on the aircraft at a more pronounced angle to the central axis of the aircraft than previous seat designs. This feature would present "challenges" in obtaining regulatory approval. In the event these were overcome with the use of an airbag. Second, it had a "flip over" feature of having the mattress on the rear of the seat, which had not been done before. Previous seats had turned into beds by reclining the seat back. Third, the paint finishes were more like those applied to cars rather than to aircraft; and fourth there were to be no visible fastenings on the seats.
71. In his witness statement Mr Higgins describes some of the drawbacks of the UCS seat. The UCS seat is expensive when compared to other seats on the market. It is a complicated design which requires the back rest to flip over so that the reverse side is used in lie flat mode. This has the advantage that a contoured back rest can be used in upright mode and a separate lie flat bed surface can be used in lie flat mode. The flip over seat involves more mechanics than a more traditional reclining seat, where the back rest simply reclines into the space behind it to form the lie flat bed. While there are some advantages with the UCS flip over design, there are real problems such as the fact the passenger must rise from the seat in order to convert it into a lie flat bed, in addition to the extra cost and complexity which are caused by the complicated mechanics. In addition a trolley service is not practical for UCS because the aisle width for UCS ranges from 15.5" on Boeing 747 to 17.35" on Airbus 330 and 340. Trolley service requires the standard 20" aisle width. In order to achieve this aisle

width, either the length of the flat bed has to be shortened, or the seats have to be installed at a less acute angle. The disadvantage of a shorter bed is reduced passenger comfort, while the disadvantage of a less acute angle of installation is fewer seats. The disadvantage of not serving meals from trolleys is that more cabin crew are needed.

72. Virgin Atlantic had specified two different angles of installation for the UCS seat: one at 40° and the other at 49°. Because the privacy screen (and its installations such as the IFE and reading light) was attached to the seat in front, if the angle of installation of the seat is changed the relative position of the screen and the passenger is also changed, by as much as six or seven inches. In the context of a confined aircraft cabin, that is a lot. This required further modifications to the design in order to accommodate different angles of installation. This effect is not produced by a seat unit where the screen is attached to the seat that it serves (such as the Rock/Solar Eclipse seat).
73. The first set of UCS seats was delivered to Virgin Atlantic in September 2003; and they went into full service in November 2003. The cost of development of the UCS seat was of the order of £50 million. The UCS seat was undoubtedly a success in the design world. It won a large number of design awards between 2003 and 2005. These included the winner of the Best Leisure Furniture Award in the FX International Interior Design Awards (2003), the winner of the IDEA Gold Award for Transport Design (2004), the Design Week Best Industrial Product Design (2004), sponsored by Anti Copying in Design and judged by Professor Darbyshire, and the winner of the IF Design Award for Transport Design (2004). Just after the launch of UCS Mr Davies was quoted in Virgin Atlantic's in-house magazine as saying that the UCS "pushed the boundaries" of business class seating, a view that he continues to hold. One of the attributes that was specifically mentioned in some of the awards was the "innovative-inward facing spatial concept in a herringbone pattern". So, also, was the flip-over seat, and the size of the bed that it made. One of the other innovative features of UCS was the angle of installation of the seats. As mentioned, they were at 40° and 49° to the longitudinal axis of the aircraft. This angle was greater than permitted by the regulations without additional passenger safety features. Virgin Atlantic overcame the regulatory problem by using an airbag. Although airbags were known in aircraft, they had previously been used for front row bulkhead seats. The airbag that Virgin Atlantic used had to deploy asymmetrically. It was developed by AmSafe. Virgin Atlantic do not claim any intellectual property rights either in the airbag itself or the idea of the airbag.
74. At the end of March 2004 Contour exhibited the UCS seat at the Hamburg Aircraft Interiors Expo. Part of the reason for doing this was to see whether the UCS seat could be licensed to other airlines, which would have helped Virgin Atlantic recoup some of its expenditure in developing the UCS seat. Contour also assisted in making presentations to other airlines. Presentations were made to Air New Zealand, Qatar Airlines and UAL in February 2004; and to Air India in September 2005. Air New Zealand took a licence for the seat recorded in a written agreement dated 27 June 2004 in return for a substantial fee. There were some features of the UCS which other airlines did not like. Some did not like the flip over seat, because it meant that the passenger had to get out of his seat in order to turn it into bed mode. Some thought

that the seating arrangement made the aisles too narrow which precluded trolley service. Others were put off by the price that Virgin Atlantic was asking for a licence.

## **Cathay Pacific and the Rock project**

### *Preliminary work*

75. In January 2004, Contour was approached by Cathay Pacific regarding the development of a new Business Class seat. This project was given the code name “Rock”. Contour approached Acumen to produce designs for the Rock project. Acumen were informed that Cathay Pacific wanted a business class product to compete with BA and the UCS. Cathay Pacific’s Request for Proposal (RFP) was sent to Contour on 20 February 2004. The minimum bed length required was 75 inches, and the minimum seat width was 21”. The RFP also included the following:

“The seat Supplier shall rethink the conventional approach of using the seat as a sleeping bed as the required foam profile and hardness are different for seating and sleeping position.”

76. On the face of it this appears to be a reference to the flip over seat back which, at that stage was unique to Virgin Atlantic. The witnesses agreed. As part of the preparation for the project, the design team also familiarised themselves with UCS, which was at that time one of the leading business class seats.

77. A meeting took place between Contour and Acumen on 18 March 2004. Mr Lawson of Acumen prepared the minutes. They recorded that Cathay Pacific recognised that they needed a product to compete with BA and Virgin and described the three options. Mr McKeever also described the three alternatives that Acumen put forward. Two were adaptations of an existing Contour seat. The third was a “blue sky” concept. It was to be a seat bed combination. At an early stage in the briefing Acumen were told that Cathay Pacific had expressed interest in a herringbone concept. For the “blue-sky” part of the brief a number of LOPAs were prepared in late March or early April 2004. Mr McKeever said that Acumen initially adopted an outward facing herringbone “even though Cathay had not voiced any preference between the two.” This was because of a perception of a cultural preference. He said that Acumen’s realisation of the cultural preference came from research that Acumen had carried out earlier when working on BA First. The cultural preference therefore led to an outward facing herringbone, where the passenger’s feet were not pointing towards the aisle. But it also meant that if the herringbone were to be reversed, then a backshield for the ottoman became desirable. Mr Dryburgh, on the other hand, said that the design team at Acumen went back to their earlier designs for the BA First seat. That was when they had first realised the virtues of an inward facing herringbone, even though customer research carried out for BA at that time had meant that it was an outward facing herringbone that went forward. Mr Dryburgh said that his initial thought for the Cathay Pacific project was to design an inward facing herringbone; but that he was told that would be unacceptable for cultural reasons, because it was offensive to serve passengers from the foot. However, there is no trace in the case papers of an inward facing herringbone at the early design stages. The options that were considered included a number of swivelling seats, some of which were in angled configurations, and some of which were in a forward facing configuration. In some of the alternatives considered the bed configuration of the



seat was aligned at 90° to the axis of the aircraft. Nevertheless Mr Dryburgh's proposal attached to his e-mail of 13 May 2004 says unequivocally that Acumen were "given the understanding" that an inward facing herringbone would not be acceptable to Cathay Pacific and that that was the reason why that avenue was rejected in the early conceptual thinking. This is near contemporaneous support for his evidence. I find, therefore, that Mr Dryburgh's recollection is broadly correct, and that although Acumen did briefly consider an inward facing herringbone, it was discarded before it reached any design drawing and was not explored further in the light of the understanding that Acumen had. That may well be why Mr McKeever either did not know of this understanding, or had forgotten it.

78. Mr Meade was very critical of the evidence that Acumen had gone back to work that they had done on the BA First seat which, he said, demonstrated Acumen's willingness to copy other people's designs. In my judgment this criticism was misplaced. First, there was no evidence that design right in the designs that Acumen looked at belonged to BA. Second, Mr Dryburgh's evidence was that the designs they went back to were designs that BA had rejected. Third, any design house will draw on its experience in designing the kind of articles under consideration, and the customer will know that. If you commission a chair from Hepplewhite you know in advance what sort of chair you will get, and you would be surprised to get something that looked like Chippendale. Acumen were one of the leading designers of aircraft seating and over the years had built up a stock of valuable know-how. I do not find it in the least surprising that they drew on that experience and know-how.
79. Mr Dryburgh of Acumen put more flesh on the bones of the blue sky concept in his e-mail to Contour early in the morning of 5 April. Among the points he made were the following:
- "8. The concept assumes the use of an airbag seatbelt as per Virgin
- ...
10. Obviously, to achieve an equal or superior offering to either BA or Virgin [Cathay Pacific] will need to face up to a significant reduction in [passenger] density."
80. Mr Dryburgh attached designs to his e-mail. These included both designs for a new first class seat and designs for a new business class seat; and a LOPA showing the layout of the cabin. It is common ground that the business class seat and the LOPA showing it in situ bear no real resemblance to UCS. No one alleges that this seat or this LOPA was a copy of anything. The PAU was a "pod" consisting of a seat and a powered ottoman. A privacy screen wrapped around the back of the seat (which abutted the aisle), and a separate low curved shield wrapped around the ottoman. The privacy screen was not of a uniform height but curved down towards the ottoman. The privacy screen was not straight in plan form, but met the sidewall of the aircraft in curve. The curve of the ottoman shield in the vertical plane was not at a uniform height, but rose towards the middle. The LOPAs for business class were all outward facing herringbones. In an outward facing herringbone the passenger, at least in the outboard seats, can look out of the window. There is therefore no need for an integral privacy screen to wrap around the ottoman; and thus the design did not have one. The

privacy screen also housed the IFE and some room for stowage. In plan form, however, the combination of the privacy screen and the ottoman shield resembled an inverted rounded J. The LOPAs showed three columns of seats across the aircraft cabin, each column being one seat wide (a 1-1-1 configuration). The central seats adopted a modified angled “yin yang” concept. Two central seats faced one way, while the next two seats faced the other. Mr Meade pointed to the fact that Mr Dryburgh had referred specifically to Virgin in the context of the airbag. I find it difficult to attribute any real significance to this reference as evidence of copying. First, Virgin claims no rights in the airbag or the idea of the airbag. Second, Mr Dryburgh’s reference was in the context of *outward* facing herringbones, whereas Virgin Atlantic’s case of copying is that it was an *inward* facing herringbone that was copied. At its highest this seems to me to indicate that the commercialisation of the UCS had shown the airline industry that it was possible to have seats at an angle of greater than 18° without having to make passengers wear a three point harness. But that is not what the present claim is about.

81. Mr Dryburgh and Messrs Jones and Bettell of Contour had a conference call later in the morning of 5 April; and at lunchtime Mr Dryburgh sent revised proposals to Contour. Most of the changes consisted of clearer labelling of the parts. Thus it was made clear that the privacy screen was partially retractable, that the ottoman was powered, and that the screen contained a monitor, table, cocktail table and reading light. There was a dropping arm at the side of the seat to ease access to the “pod”, and the ottoman lifted to provide storage space underneath. The privacy screen incorporated a “lift and drop” table positioned immediately above the forward edge of the seat pan and a 15” monitor directly above it also in the privacy screen. On 8 April Mr Jones sent on the designs to Cathay Pacific as part of Contour’s proposal. The seats were to be installed at an angle of between 30° and 50° from the longitudinal axis of the aircraft; and accompanying text to the “blue sky” concept said that due to the seat angle Contour would look at developing a new three point seatbelt harness for take off and landing. It did not mention an airbag. The seats were configured in an outward facing herringbone arrangement. But the principle of an angle of installation greater than 18° had been established in Acumen’s design. The price comparison between the various options indicated the likely price of the “blue sky” option based, as the presentation said, “on Malcolm without seat” for the furniture, and a separate price for the seat.
82. On 20 April Mr Yeung of Cathay Pacific responded to the Contour proposals. The first two options, based on existing Contour seats, did not meet Cathay Pacific’s requirements, because they did not provide a completely flat bed. The blue sky option was not satisfactory either, because it failed to meet Cathay Pacific’s requirement for passenger numbers. Although the LOPA did show the required number of business class passengers, it only achieved this by using space that would otherwise be used for economy class passengers. This may have arisen out of a misunderstanding between Contour and Acumen. At all events, Mr Yeung asked Contour to think again. A week later Mr Yeung sent another e-mail. He was still very concerned about the reduction in seat count. He continued:

“We would like to [enquire] if [Contour] can make scale-down version of the proposed seat (i.e. make all dimensions smaller) and adopt the [Virgin] fishbone layout concept to roll out a

LOPA which can accommodate our required min. seat count of 43 [passengers] in J-class. Also can you [please] clarify if there is any patent issue regarding the fishbone layout concept.”

83. At this stage Acumen and Contour pursued the route of scaling down the seat dimensions, rather than introducing an inward facing herringbone, although Mr Dryburgh accepted that he was told of Mr Yeung’s request at the time.

*May 2004*

84. On 4 May 2004 Mr Lawson sent Contour another LOPA, showing a different seat layout but still in an outward facing herringbone. On the LOPA for the main deck of the 747 the seats had been installed at a more acute angle, which gave space for a 1-2-1 configuration, thus increasing the passenger count to 16. It is notable that although Cathay Pacific had asked for the adoption of the “Virgin fishbone layout concept” which was the only inward facing herringbone then in service, Acumen in fact provided another outward facing herringbone. It is not entirely clear why Acumen persisted with an outward facing herringbone in the face of the client’s requests; but the answer may be that they thought that an outward facing herringbone would provide better accommodation and facilities for individual passengers. Mr Jones and Mr Bettell flew to Hong Kong for a meeting with Cathay Pacific which took place on 6 and 7 May 2004. In their report of the meeting to their colleagues in Contour they said:

“[Cathay Pacific] require a full flat seat for their new fleet of B 747-400 aircraft using either the existing Eclipse mechanism (doubles & Triples) or a single pod type seat configured in a similar way to Malcolm. ... [Cathay Pacific] presented Contour with various lopa options they had been considering in-house, including the Eclipse at 73” forward and rear facing and a Herring boned “Blue Sky” option based on the Malcolm lopa.”

85. Mr Meade points to the reference to a “single pod type seat configured in a similar way to Malcolm”. While this is, no doubt, a reference to the UCS it is presented as an alternative to the existing Eclipse mechanism; and the existing Eclipse mechanism is what was in fact used. Indeed, the reference to the Eclipse mechanism suggests that the corresponding reference to Project Malcolm was a reference to the flip-over feature of the seat itself rather than the cabin arrangement. The seat design that Contour had presented was in fact a “single pod type” seat, but it was not configured in a similar way to UCS, because it was not inward facing. It is also clear from this report that Cathay Pacific had been preparing their own LOPAs, at least one of which was based on UCS. It seems probable that Cathay Pacific gave the Contour team a copy of their in-house LOPAs at that meeting. It showed an inward facing herringbone.
86. On 10 May Cathay Pacific informed Contour that they had been shortlisted for both a first class seat and a business class seat; and invited them to make a presentation in Hong Kong on 9 June. Cathay Pacific raised a number of questions to which they wanted answers at the presentation. One of the questions concerned the loss of seats, which still did not meet Cathay Pacific’s requirements. They asked:

“Is it possible to achieve [Cathay Pacific’s] seat count requirement by

1. Reducing the size of the proposed seat to RFP requirement of 72”
2. Using the VS upper class suite LOPA concept?”

87. Mr Jones of Contour e-mailed a copy of the Cathay Pacific in-house LOPA (in pdf form) to Mr Gentry (copied to Mr Davies among others) on 11 May 2004. His covering e-mail referred to the presentation of a LOPA based on Contour’s existing seat and continued:

“We have also presented them [i.e. Cathay Pacific] with an Herring boned “Blue Sky” seating option, offering a 6ft 8” bed with associated furniture. The problem they have with our product is this would reduce the minimum pax count from 43 to 34. Again, they have carried out their own lopa work using a familiar configuration (see if you can guess!!).

Could you review these this week and validate using our known seat dimensions?”

88. It is clear that in the parenthesis Mr Jones was alluding to the UCS configuration, as Mr Gentry accepted. Mr Gentry said that his team did not have access to UCS data and could not, therefore, have tried to fit UCS within a LOPA. He accepted that Mr Davies (to whom the e-mail had been copied) did have access to the data, but said that he did not ask Mr Davies to do anything in response to Mr Jones’ request. I accept this evidence. In fact, as a subsequent e-mail reveals, work on the existing seat options was carried out by Mr Robert Clarke, a design engineer at Contour. The same Cathay Pacific in-house LOPA was faxed by Contour to Acumen on the same day. Why it was faxed rather than sent by e-mail is a mystery; but Mr McKeever said that he clearly recalls waiting by the fax machine to receive it, and I have no reason to disbelieve his evidence on this question.

89. On 13 May Mr Dryburgh sent Contour a proposal for the new seat. He noted that the design for the business class seat had not met Cathay Pacific’s requirement for passenger numbers. He continued:

“Peter Jones (Contour) and John Higgins (Contour) have briefed Acumen on their updated understanding of the requirements with a copy of a “Virgin Style” LOPA prepared by the [Cathay Pacific] team in-house. To achieve the Business Class [passenger] numbers dictated by the [Cathay Pacific] Business Plan, as we understand it, it suggests that we should develop a more compressed Concept based more around a variant of the “Virgin LOPA” if we are to successfully comply with their latest preferences.”

90. He went on to say:

“Originally Acumen had been given the understanding that a “Virgin Style” inboard facing concept would not be acceptable to [Cathay Pacific] as they prefer to serve meals from the side, and hence this conceptual avenue was rejected in our earlier thinking.

Following a conversation with Peter Jones today endorsed by the LOPA given to him, it would now seem logical to rework our concept in line with this approach.”

91. He asked for an urgent call “as we are well into development”. Mr Higgins agreed that the briefing must have taken place on the basis of the inward facing herringbone LOPA that Cathay Pacific had supplied to Contour a few days earlier. He also said that his understanding at the time was that Acumen would rework their existing design, but based on that LOPA. However, he said that there was little guidance that could have been obtained from that LOPA, because it contained no dimensions, and in particular no aisle widths, and no station lines for monuments. All that could be gleaned from it was that Cathay Pacific wanted an inward facing herringbone. Mr McKeever recalls that in May 2004 Contour told Acumen that “Cathay wanted us to adopt an inboard facing herringbone layout to achieve maximum headcount in the same way that VAA had done”. Mr Dryburgh explained that Cathay Pacific’s requirement for the pax count overcame their cultural resistance to an inward facing herringbone. This LOPA was sent on 13 May, and I will revert to its details shortly. For the moment I note simply that the inward facing herringbone enabled a configuration of 1-2-1 on the main deck of the 747 to accommodate 20 passengers, an increase of 4. On the following day, 14 May, Mr Clarke e-mailed LOPA revisions “per the new layouts received from Cathay via Peter Jones.” These were the LOPAs based on the existing seats in a forward facing arrangement, and did not include the “blue sky” option. Mr Gentry forwarded the e-mail to Mr Jones, commenting:

“I have just been speaking to Ian Dryburgh of Acumen and I understand that they are looking at the “guess who” design.

We are helping with info where possible”

92. As Mr Gentry accepted the “guess who” design was Virgin Atlantic’s. About half an hour later Mr Gentry e-mailed Mr Dryburgh copies of the LOPAs that had been produced during the brainstorming session a year earlier. These included the inward facing herringbone. In his oral evidence Mr Gentry said that he could not recall having provided Acumen with any “info” apart from these LOPAs. Mr Gentry commented in his covering e-mail:

“As you can see, like Virgin you can have a 78” flat surface if you have a pointed head.”

93. This (not very good) joke referred to the fact that in order to achieve its advertised bed length Virgin Atlantic measured right into the corners of the bed space which were in practice unusable. Very shortly afterwards Mr Dryburgh e-mailed Mr Jones. He said:

“I spoke with Bruce Gentry regarding our current approach to the Business Class Concept, which he agreed should work

according to his quick and dirty earlier investigations. He would prefer not to offer a saw-tooth lay flat mechanism (as per Virgin) as it adds undue complexity with seemingly little benefit. Perhaps we could offer it at a later stage if required.”

94. It is plain that Mr Gentry and Mr Dryburgh had talked about the Virgin layout in their conversation of 14 May. It was natural for them to have done so, since the LOPA that Cathay Pacific had prepared to record their own ideas was itself plainly based on Virgin Atlantic’s layout; and Cathay Pacific had specifically asked Contour to adopt a “Virgin fishbone layout”. However, neither Mr Dryburgh nor Mr Gentry had detailed information about UCS; and in my judgment their conversation was at a fairly general level. What they seem to have discussed was whether an inward facing herringbone would work (that having been the subject of Mr Gentry’s “quick and dirty” investigations back in May 2003). They also discussed the seat mechanism, but expressly rejected the Virgin Atlantic mechanism. I accept Mr Gentry’s evidence that this was the only “info” that he provided to Mr Dryburgh.
95. On the same day Mr Dryburgh sent Contour new LOPAs. Again I will revert to the details of these LOPAs shortly. One significant feature of these LOPAs was that one of them showed a passenger when the seat was in bed mode. The passenger’s head was shown as protruding into the triangular space formed between the back of the seat and the cabin wall. Mr Jones duly reported to Mr Yeung that the design was being reworked; and asked if the date for the presentation could be deferred for a week. However, this did not prove possible. But on 17 May Mr Jones e-mailed Mr Yeung to say that they could meet the deadline of 9 June for the presentation and had “styled a product based on the Blue Sky J Class LOPA you provided me in HK”. In his evidence Mr McKeever said that reworking the original “blue sky” concept from an outward facing herringbone to an inward facing herringbone was “not a big deal”. He said that in its work for BA Acumen had invented the herringbone and had proposed both inward and outward facing herringbones, albeit that it was only the outward facing herringbone that had been commercialised. The starting point for both the original “blue sky” concept and the reworked version had been the same: the standard Eclipse seat mechanism. Acumen also carried over the same packaging proposals from the original concept to the reworked version and drew on their experience with BA in designing an inward facing herringbone. He stoutly resisted the suggestion that the redesign made use of the UCS LOPA.
96. The central thrust of Virgin Atlantic’s case on copying is that due to pressure of time, Acumen copied the Cathay Pacific representation of the UCS into their own LOPA of 13 May; and thence (directly or indirectly) copied it into their LOPA of 14 May. The LOPA of 14 May became the foundation for the subsequent development of the seat; and hence the seat can be seen to have been indirectly copied from UCS.

#### *The May LOPAs*

97. Three LOPAs form the bedrock of Virgin Atlantic’s case that Acumen copied the UCS design. The first is the LOPA that Cathay Pacific generated in house and sent to Contour on 10 May 2004. This was passed on by Contour to Acumen and was used in the briefing of Acumen by Contour in order to explain Cathay Pacific’s requirements. The second was the LOPA produced by Acumen on 13 May 2004; and the third was the LOPA produced by Acumen on 14 May, which became the basis for

further development of the LOPA for Rock and subsequently Solar Eclipse. I have already mentioned all three in the general narrative. Virgin Atlantic's case is that the LOPA of 13 May was a copy of the Cathay Pacific LOPA and that the LOPA of 14 May was a reworking of the LOPA of 13 May, but in substance another copy of it. Mr McKeever produced overlays of the various LOPAs which illustrated the similarities and differences between them; and also the similarities and differences between them and a genuine Virgin Atlantic LOPA.

98. All the witnesses agreed that the Cathay Pacific LOPA was a crude representation of UCS on a Boeing 747. The ottoman depicted on the Cathay Pacific LOPA was of a similar size and shape to UCS, and the seat width was the same. The privacy screens were depicted as crude arcs; and the spatial layout was very poor. Some seat units fouled the lavatories; and others were very wasteful of space. The number of seats depicted matched the number that Virgin Atlantic accommodated in this part of the aircraft: six in each of the two columns of seats adjacent to the aircraft sidewall, and two columns of four in the centre (6-4-4-6). The aisle widths were very close to the aisle widths on the Virgin Atlantic LOPA. The seat width, so far as it can be estimated, was 22"; and this seat width was carried forward into the other two May LOPAs. The Cathay Pacific was not, however, the Virgin Atlantic LOPA. Contour had access to the Virgin Atlantic LOPA; but there is no evidence that an actual Virgin Atlantic LOPA was passed to Acumen at this stage.
99. Mr McKeever's overlays revealed the following differences between the Cathay Pacific LOPA and the Virgin Atlantic LOPA:
- i) The angle of installation of the outboard seats differed by 2° to 5°, and the angle of installation of the central inboard seats differed by a greater amount (perhaps as much as 7°);
  - ii) The Virgin Atlantic LOPA included a bar in the central section of the cabin, whereas the Cathay Pacific LOPA did not, with the result that there was more space for seats in that area;
  - iii) Although both LOPAs included curved privacy screens, the shape of the curves differed;
  - iv) The seat length was different on the two LOPAs; and on the Cathay Pacific LOPA the outboard seats were positioned far closer to the sidewall of the aircraft.
100. The next step in the argument is that Acumen copied Cathay Pacific's LOPA when producing the LOPA of 13 May. Mr McKeever did not think that he was the draftsman of the 13 May LOPA, so that his evidence was mostly reconstruction rather than recollection. Mr Meade said that his evidence was worthless on that account; but I do not think that it was, coming as it did from an experienced designer who was closely involved in the overall project.
101. Mr McKeever's evidence was that the only similarities between the 13 May LOPA and the 14 May LOPA (both of which had been produced by Acumen) were the angle of the seat and the position of the seat itself, which were identical. Attached to the 14 May LOPA there was a sidewall seat assessment, which showed how close to the

aircraft sidewall the seat could be placed. The sidewall assessment required the use of the standard Solar Eclipse seat mechanism, but adapted to make it lie completely flat when in bed mode. The seat mechanism had a protruding rear link; and in order to make the seat lie flat Mr McKeever thought that the rear link would have to be extended. This in turn meant that the seat could not be as close to the aircraft sidewall as he would have liked; and also that when the seat was fully reclined in bed mode, there was a gap between the top of the seatback and the aircraft wall. The sidewall assessment showed how close the seat could be placed to the sidewall of the aircraft, but it did not dictate the angle of installation. Having ascertained how close the seat could be at an angle of 90° (the worst case) the seat could then be pivoted to the desired angle, which would essentially be determined by trial and error. The object of the exercise is to have as many seats as possible, and therefore the designer chooses the steepest possible angle compatible with the width of the aircraft and the width of the aisles. Mr McKeever deduced that the sidewall seat assessment must have been carried out before the production of the 13 May LOPA, since the angle of the seat and the seat positions were identical in each of the 13 and 14 May LOPAs. In addition the 14 May LOPA was used to build the mock up presented to Cathay Pacific in June, and the sidewall assessment must have been done before then. The sidewall assessment fixing the seat position must therefore have been carried out before 13 May, otherwise the seat position would have changed throughout the working up of the design. Mr McKeever produced an overlay of the 13 May LOPA over the Cathay Pacific LOPA. From that overlay it can be seen that:

- i) Whereas each of the outer columns of the Cathay Pacific LOPA contained six seats, the outer columns of the 13 May LOPA each contained five seats;
- ii) Whereas each of the central columns of the Cathay Pacific LOPA each contained four seats, the central columns of the 13 May LOPA each contained five seats;
- iii) There is a visible difference in the aisle width between the two LOPAs. The 13 May LOPA has an aisle width at floor level which may be 3 or 4 inches wider than the Cathay Pacific LOPA (and some 5" wider than the aisle width at floor level on a Virgin Atlantic LOPA);
- iv) Although the angle of installation of the seats in the outer columns is close to the angle of installation in the Cathay Pacific LOPA, there is a very visible difference between the angles of installation of the seats in the two centre columns. Those in the 13 May LOPA are at a less acute angle to the longitudinal axis of the aircraft. Mr McKeever's evidence was that it was desirable, for manufacturing purposes, to have the same angle of installation for the outboard and inboard seats, and that the angle of installation of the outboard seats determined by the sidewall assessment would have been carried through to the inboard seats;
- v) The pitch between the seats is different;
- vi) The shape of the seat (and in particular the back rest) is different;
- vii) The ottoman on the 13 May LOPA is larger than that shown on the Cathay Pacific LOPA, and, although it is a similar shape, it is more pointed;



- viii) The seat back of the outer seats on the Cathay Pacific LOPA is closer to the sidewall of the aircraft than on the 13 May LOPA. This last feature, in particular, supports Mr McKeever's evidence about the sidewall assessment;
  - ix) Although the privacy screens in both LOPAs are curved, the curve is of a different size and shape.
102. Although Mr McKeever did not draw the 13 May LOPA himself, he agreed that whoever did so had looked at the Cathay Pacific LOPA "and did their own version of that". That answer, however, begs the question: what is meant by "that"? Mr Dryburgh was not involved in the drawing of 13 May, but he was asked about it in cross-examination. His evidence was that it was certainly similar to UCS; but he added that: "to my eye there are obviously quite fundamental differences from the real Virgin product but certainly as a superficial representation of a Virgin product you could be forgiven for thinking, yes, that is a Virgin product."
103. Mr McKeever was involved in the drawing of the 14 May LOPA. As indicated he accepted that the seat positions (including the angles of installation which are dictated by the seat position) were the same as they had been on the 13 May LOPA, because the sidewall assessment had been carried out on or before 13 May. It was the 14 May LOPA that was the real starting point for the Rock design. It was more detailed than the 13 May LOPA, and showed the seat both in seat mode and also in bed mode. The sidewall assessment showed the seat in elevation up against the sidewall of the aircraft. It showed the backrest, the seat pan and an extendable footrest. Projecting those lines dictates the position of the split lines when the seat is in TTOL mode. That in turn has a knock-on effect on the size of the ottoman. As between the 13 May LOPA and the 14 May LOPA:
- i) The seats were now shown both in TTOL mode and also in bed mode;
  - ii) The seat positions (which encompass both the angle of installation and the position of the seat within the bed block) were the same, because of the sidewall assessment;
  - iii) The privacy screen now wraps round the back of the ottoman, whereas on the 13 May LOPA it stopped at the front edge of the seat pan. It is also a very different shape. Whereas the privacy screen on the 13 May LOPA was a relatively simple arc, that on the 14 May LOPA is a much more complex shape;
  - iv) The 14 May LOPA also included cocktail tables attached to the privacy screen;
  - v) The ottoman in the 14 May LOPA is smaller. This was the result of the sidewall assessment. Because Acumen were using a standard seat mechanism, which had fixed lengths for the back rest, seat pan and extendable foot rest, the size of the ottoman had to be reduced. In addition the side of the ottoman further from the aisle begins with a straight line, whereas the ottoman on the 13 May LOPA did not have that feature;
  - vi) In addition the shape of the end of the ottoman on the 14 May LOPA had become more rounded, and the overall footprint of the front of the PAU

incorporated that change within the sweeping curve accommodating the cocktail table;

- vii) The fact that Acumen were using a standard seat mechanism also meant that the length of the seat back was fixed. It was not tall enough to accommodate a tall passenger when the seat was reclined into bed mode. There were two options for dealing with this. One was to incorporate a padded area behind the seat into the bed when the seat back was reclined. The other was to create a pointed headrest to fit into that space. Mr McKeever suggested that both options were shown on the 14 May LOPA. But to my eye only the first of these options was shown, although in fact the second option was the one that was subsequently chosen.
104. In his cross-examination Mr Dryburgh was shown an overlay comparing the 13 May LOPA and the 14 May LOPA. He agreed that the seat positions between the two LOPAs were the same. The split lines shown on the seats were also the same. Since the 13 May LOPA and the 14 May LOPA had been drawn after the sidewall assessment of the standard Eclipse mechanism this was hardly surprising. But he said that there were many other differences between the two. The 14 May LOPA contained much more detail about the seat both in seat mode and in bed mode. The 14 May LOPA had also introduced the cocktail tables, which necessitated a change to the shape of the ottoman. Mr McKeever also agreed that the seat positions were the same, for the reasons given.
105. It is, in my judgment, plain that Cathay Pacific's instruction that they wanted a Virgin-style fishbone concept which had been given both verbally and by way of the visual representation in the in-house LOPA was the starting point for the LOPAs of 13 and 14 May. But their instruction was not that they wanted a copy of UCS. Their instruction was that they wanted the same *concept*. At most what Acumen took from that was the idea or concept of the inward facing herringbone. The idea that the angle of installation of the seats should be greater than 18° had already been established in the outward facing herringbone that Acumen had proposed in April. Moreover, Acumen had briefly considered (and rejected) the idea of an inward facing herringbone right at the beginning of the project. In addition Acumen did not have access to a genuine Virgin Atlantic LOPA and the in-house LOPA produced by Cathay Pacific was far too crude and inaccurate to form a basis for copying. Mr Meade submitted that Acumen also took the idea of incorporating part of the space behind the seat into the bed. It is true that that idea was present in the 14 May LOPA. But it is unlikely to have come from the Cathay Pacific in-house LOPA because that drawing was too crude and the seat positioned too close to the aircraft sidewall to enable that to be done. It does, however, seem probable that Acumen knew that this was one of the features of UCS because it had been one of the features that had won such plaudits in the design press. Nevertheless, since Acumen were instructed to use a standard seat mechanism, I do not find it difficult to find that a competent designer, embarked on an inward facing herringbone, would independently come up with that idea. Virgin Atlantic invite me to infer that detailed 3-D design data was given by Contour to Acumen. There is no positive evidence to this effect. The inference is based on allegations about the insufficiency of Contour's disclosure. But Acumen has given full disclosure (despite not being a party to the litigation) and that reveals no such data. I decline to draw that inference. In addition, within the constraints of

aircraft seating design, the significant differences between that and the 13 May LOPA and the further differences between the 13 May LOPA and the 14 May LOPA do not lead to the inference that any one of the LOPAs was copied from the other. Although the seat positions in the 13 May LOPA were carried forward into the 14 May LOPA, that was the result of the sidewall assessment which had been independently carried out by Acumen on the basis of the standard seat mechanism. As Mr Vanhegan submitted, any other conclusion necessarily entails that (at least) Mr Dryburgh and Mr McKeever were engaged in a dishonest conspiracy to mislead the court. Having heard both of them give evidence, I do not believe that they were.

*The presentation and afterwards*

106. Contour produced a brochure showing the designs which Acumen had made for them, and a spatial mockup of the design. A team from Contour and Acumen flew to Hong Kong to present the design to Cathay Pacific. The design was now an inward facing herringbone. The PAU consisted of a seat and an ottoman enclosed by a privacy screen. Whereas Option 3 (presented to Cathay Pacific in April) had been an outward facing herringbone with the privacy screen wrapping round the back of the seat and a separate backshield for the ottoman, the new design had the privacy screen wrapping integrally round the back of the ottoman, and no privacy screen or shell round the back of the seat. One reason for this change was that the shell at the back of the seat is designed to hide the seat mechanism which would otherwise be exposed to the aisle. In an inward facing herringbone this is unnecessary, because the seat mechanism is hidden by the sidewall of the aircraft. The position of the “lift and drop” table and the monitor were the same, relative to the seat, as they had been in the outward facing herringbone which had been the subject of Contour’s initial proposal to Cathay Pacific back in April. The ottoman had a flip over seat, whereas the previous ottoman had not. Behind the screen at the back of the ottoman (where there had once been a triangular protrusion) there was now a cocktail table, accessible from the adjacent seat. The shape of the privacy screen and the ottoman, in plan but without the cocktail table, was rather like a soup ladle or reversed J. The length of the bed was given as 79”. It had a generally flat headrest with rounded shoulders, and when reclined backwards fitted into a curved surround behind the seat. Further drawings in the same brochure showed that in order to achieve the 79” bed length, it would be necessary for a passenger’s head to rest on the triangular area between the rear of the seat and the cabin wall. At this stage in the project the Rock design used a reclining seat co-operating with the curved surround tailored to match the shape of the headrest in the standard Eclipse seat, whereas the UCS did not use a reclining seat in bed mode: it used the flip-over seat. The design of Rock in this respect was later changed in order to avoid infringing one of Virgin Atlantic’s patents (not the patent in suit). Acumen had created two LOPAs; one based on a seat width of 20” and the other on a seat width of 22”. The mock up was based on the 22” seat width design.
107. On 16 June Mr McKeever sent Mr Bettell his draft of answers to Cathay Pacific’s questions which had been raised before the June presentation. On the question whether the passenger numbers could be achieved he said that new LOPAs addressed the issue (including one that had been issued on 16 June). The other questions and answers of significance was the following:

<ul style="list-style-type: none"><li>• At which design stage was [Contour] involved for the current VS upper class suite design?</li><li>• To what extent was [Contour] involved in the design of VS's upper class suite?</li><li>• What percentage of work originated from [Contour]?</li><li>• Who has ownership of design right? Can [Contour] propose a similar solution for other airline customers?</li><li>• Are there patent or design right issues that could limit/restrict your current proposals?</li></ul>	<ul style="list-style-type: none"><li>• From 1<sup>st</sup> mock-up stage</li><li>• Design engineering and functionality<ul style="list-style-type: none"><li>• 90%</li><li>• Virgin have design rights/protection on the flip-over seat feature. This is not compromised by our proposed design.</li></ul></li><li>• None that we are aware of</li></ul>
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108. These answers do not seem to have been actually sent to Cathay Pacific; but Mr McKeever agreed that they represented his understanding at the time. In particular, he understood that Virgin Atlantic's intellectual property rights were confined to the flip-over seat. By the time of the presentation to Cathay Pacific in June 2004 the basic elements of the Rock seat were in place. These included:

- i) An inward facing herringbone at an angle of installation greater than 18°, although the precise angle between the seat axis and the fuselage axis had not been finally determined;
- ii) A seat whose seat pan travelled forwards to convert into a bed, co-operating with an ottoman and a foot rest; and a back rest that reclined;
- iii) A privacy screen forward of the seat and wrapped round the ottoman;
- iv) The privacy screen and ottoman in plan view was generally J-shaped; and the privacy screen had cocktail tables attached where the privacy screen abutted an adjoining forward seat;
- v) The screen housed the IFE, seat controls and literature pocket;
- vi) There was stowage both under the ottoman and also behind it under the cocktail table.

109. Following the presentation to Cathay Pacific in June, Cathay Pacific decided to pursue the Blue Sky Business Class proposal further. Contour created a working seat mechanism and did further work on a revised 20" wide spatial mock-up. Acumen made further refinements and amendments to the Blue Sky design including extending the stowage under the ottoman, removing the cupboard stowage, adding a further shelf beneath the cocktail area, and removing the dropping arm. It was also at this stage that the concept of an adjustable electric pointed or triangular headrest was introduced. This was done so as to avoid the possibility of infringing one of Virgin Atlantic's patents by using the surround as part of the bed surface. Acumen also

made minor changes to the layout of the suite to reflect the removal of the dropping arm and to refine the detail to reflect these other changes. At the end of July 2004 Mr McKeever flew to Hong Kong to make another presentation to Cathay Pacific, and to show them another spatial mock-up.

110. However, Cathay Pacific did not progress the designs any further. Their decision was known in about October 2005. The Rock seat became the basis for a new seat that Contour supplied to Air Canada. During the course of its further development a number of further changes were made, as I will recount in due course.

### **Air Canada**

111. On 22 June 2004 Contour were approached by Air Canada about the possibility of obtaining a licence for the UCS. There was a tight timescale, because Air Canada wanted to launch in July 2005 which was just over a year away. In view of the timescale for developing a new product from scratch, the use of an existing (and safety certified) product was attractive. Mr Bettell of Contour immediately put Mr Palmer of Virgin Atlantic in touch with Mr Reeleder of Air Canada. Mr Palmer e-mailed Mr Reeleder on the same day. Mr Bettel had alerted Mr Palmer to a possible problem, namely that the UCS had not been designed for a Boeing 767, which was Air Canada's principal aircraft. Mr Palmer told Mr Reeleder that in installing UCS he could expect a 10 per cent loss of seats (about 4 seats) as compared with a traditional business class layout. Contour supplied LOPAs to Air Canada showing UCS seats on Air Canada aircraft on 8 August 2004. In parallel with these negotiations over a licence for the UCS, at some time in July Contour offered Air Canada the Rock seat which at that stage in their discussions was called the "Confidential Seat" or the "secret" seat. Personnel from Air Canada arranged a meeting with Contour in early August 2004. The purpose of the meeting was (among other things) to go over drawings and LOPAs for UCS in an Air Canada cabin and to look at renderings and LOPAs for the Confidential Seat. The seat which Air Canada eventually used, based on the Rock seat, is called the "Solar Eclipse". On 23 September Ms Muklevicz, the Regional Sales Director of Air Canada, e-mailed Mr Higgins of Contour. She said that Air Canada were "still very interested in either the Virgin Seat or the Rock seat, however, Robert Milton [the CEO of Air Canada] is finding it difficult to justify the VAA licensing fee". She asked for a price for the Rock seat and for help with speeding up its delivery. At this stage, Mr Higgins was lukewarm about supplying Rock as opposed to UCS. In his reply he proposed a number of modifications to the UCS in order to fit it onto a Boeing 767. He also said that delivery of a UCS derivative would be quicker (by some six months) than the Rock seat. At this stage, Cathay Pacific had not communicated a final decision about Rock; and if they had decided to select Rock, Contour had promised them exclusivity for twelve months. Contour had not, however, given that reason to Air Canada. On 29 September 2004 Mr Higgins sent Air Canada revised LOPAs. These showed (among other things) the UCS at a different angle, which had the consequence that the ottoman size had to be reduced in order to accommodate an aisle width of 17". On 19 October 2004 Air Canada had a press launch for its new look, which included a new design and colour scheme for its fleet, new uniforms for its staff and new in flight entertainment systems. It also said that it would proceed with the introduction of the newest generation of premium lie flat seating beginning as early as September 2005. On 24 October 2004, a meeting was arranged in Canada between Air Canada and Virgin

Atlantic to discuss the licence arrangement. The meeting went badly; and it seemed that the negotiations would flounder over the cost of the licence. Until December 2004 Virgin Atlantic continued to attempt to persuade Air Canada to take the UCS. Contour were also keen to help and offered a discount on the manufacturing price which would have amounted to some £3.75 million. Nevertheless the price gap could not be bridged, and the negotiations failed.

112. On 3 December 2004 Mr Friess of Air Canada asked Contour to prepare some LOPAs with the Rock seat. He asked whether the angle of the Rock seat could be adjusted to allow for a 17 inch aisle, which could be a selling feature against the Virgin suite. On the same day he sent Contour a preliminary drawing that he had produced himself with Virgin suite data that Contour had given him. On 6 December Mr McKeever of Acumen was sent by Contour a .dxf file of the Virgin Atlantic LOPA for the A340-300. The significance of a .dxf file is that it enables a two-dimensional or three-dimensional drawing produced on one CAD system to be read by another CAD system, and it contains digital data which can be manipulated (unlike a .pdf file which is simply a picture). Mr Higgins accepted that it was quite wrong of Contour to have sent a .dxf file of Virgin Atlantic's LOPA to Acumen. In his reply of the same day Mr McKeever asked:

“Would it be possible to forward me the PDF's with the Virgin product that you received from Henry Friess at Air Canada. Ben Bettell only forwarded one to me and I believe that there were 3 in total.”

113. A minute later Contour sent him all three. These, however, were .pdf files. In his oral evidence Mr McKeever said that he had heard that Air Canada had produced LOPAs with changes in the position of monuments; and that that is what he wanted to see. He said that he had referred to these LOPAs as .pdfs “with the Virgin product” because this was shorthand for the latest LOPAs. I found this evidence difficult to understand. Air Canada was considering taking a licence for UCS, but that came to nothing. UCS was never installed on Air Canada aircraft. So any LOPAs produced with UCS were in the realms of theory only. They were not LOPAs for aircraft that existed in the real world. In fact Acumen already had LOPAs for Air Canada's existing aircraft on their system. Mr McKeever suggested that part of the exercise undertaken by Air Canada was to assimilate the layout of their various different types of aircraft, both for crew training and also for easier passenger orientation; and that when a new seat was installed this was an ideal time to make changes because the aircraft would be grounded for some time. Even with this explanation I found it difficult to understand why Mr McKeever had specifically asked for files showing “the Virgin product”. That said, there is no evidence that Mr McKeever actually made any use of these LOPAs, and I am not prepared to infer that he did. At the stage that the designs had reached in December 2004 I cannot see how they would have been of any practical help; and although many more LOPAs were produced in the course of the project it was not demonstrated that any of them were copies of or influenced by the LOPAs sent in December.
114. On 10 December 2004 Mr Higgins sent Mr Friess a series of LOPAs that had been prepared by Acumen. Some were for a B767-300 and some for an Airbus A340. All showed a 1-1-1 layout of seats. These were well received by Air Canada; and on 23

December 2004 Contour put forward a formal proposal for the design and manufacture of new business class seats. The proposal described the brief:

“From our various discussions, meetings and e-mail transmissions Contour understand that Air Canada are embarking on a new cabin upgrade of their Executive Class seating which will encompass a new seating product that will translate to a bed without the need of a passenger having to get up from his seat.”

115. Virgin Atlantic submit that this description of the brief is a clear indication that Air Canada wanted to take UCS and improve on it. I agree that there is an oblique reference to UCS, because one of its perceived drawbacks was that the passenger had to get out of his seat in order to turn it into a bed. But for a brief to say that its objective was to produce a better product than the market leader does not lead to the inference that the market leader will be copied, particularly when the brief rejects one of its most striking and innovative features.
116. In January 2005 Mr Higgins of Contour sent Mr Friess of Air Canada a certification plan that they had prepared for the UCS to support its installation on the Boeing 747 and Airbus. It described the product and the certification criteria which had to be satisfied. Mr Higgins said that he expected that the basis of certification would be similar for the new seat and that “compliance would be shown by testing of the product plus similarity to the Virgin product where applicable (for instance performance of the airbag and occupant injury protection).” In fact it turned out that all the tests had to be carried out independently for the Solar Eclipse and that similarity to UCS could not be relied on to dispense with any testing. Also in January 2005, following a presentation of the design for Solar Eclipse by Mr Higgins and representatives of Acumen, Mr Gentry was appointed lead design engineer for the project, and Mr Allen also joined the design team to carry out work on the LOPAs. Mr Gentry supplied him with a set of LOPAs that had been prepared by Acumen. Throughout January Mr McKeever continued to refine work on the LOPAs. Modifications included adjusting the aisle widths, making provision for trinket trays behind the seats, realigning seats to deal with changes in the position of monuments, and so on.
117. At the end of January 2005 a design consultancy called Future Brand made a presentation to Air Canada. It consisted largely of a comparison between the UCS and the new suite. They said that their concerns were:
  - i) The privacy screen wrapped around the footstool which compromised the passenger’s perception of space;
  - ii) The privacy screen was bulky which made access difficult and cramped;
  - iii) The length, height and shape of the privacy screen gave a “stall-like” quality.
118. They suggested that the privacy screen be redesigned to facilitate passage and to gain perception of more space within the suite and in the aisle. One of the ways in which this could be achieved was by lowering the height of the screen. Mr Dryburgh and Mr McKeever of Acumen attended the presentation. Mr McKeever said that the

mock up of Rock which Future Brand had compared with the UCS in actual service was not a fair comparison. The mock up had been a spatial mock up only, and had not addressed matters of detailed styling. That was yet to come; and Acumen had already come to the conclusion that the screen needed modification to reduce its bulk. Mr Dryburgh explained that Future Brand were Air Canada's consultants on colours and trim and that he regarded them as amateurs in the field of aircraft furniture design. Although Acumen themselves had been coming to the view that the privacy screen was too bulky, he disagreed with the remainder of Future Brand' comments. However, Future Brand had the ear of some of the senior management within Air Canada, and carried political clout with the people who mattered. Mr Dryburgh therefore felt that Acumen had at least to pay lip service to Future Brand' comments. But Mr Dryburgh resented having even to discuss UCS, and thought that Future Brand were obsessed with Virgin; and he was resistant to making changes simply to make Acumen's design more similar to Virgin's. The frequent reference back to Virgin Atlantic's UCS was by Air Canada was, however, understandable since they had been seriously interested in licensing its use. It was therefore natural that when they were evaluating Acumen's alternative design they were concerned that it should outdo UCS. Mr Dryburgh accepted this, and that is why he thought that UCS was a natural comparator. What, however, he adamantly refused to accept was Mr Meade's suggestion that Air Canada's instruction was to "take UCS" and seek to improve it with better or additional features.

119. One of Mr Allen's tasks was to prepare the LOPAs and to make sure that they complied with Air Canada's specification for the monuments. He noticed a discrepancy in relation to the Airbus A330. Air Canada had specified monuments at a height of 39". But when Mr Allen checked the design data he had received from Acumen, he noticed that the screen height was 43". He mentioned this to Mr Gentry. There was thus a potential clash between the two heights. Mr Gentry asked him to recheck it. Mr Allen offered the suggestion that the 39" mentioned in the monument specification might have been measured from a different point, which would have explained the discrepancy. He thought that the height in the monument specification would have to be amended, although that was a matter for Air Canada. He also thought that the height of 43" was more consistent with the physical mock-up that he had seen. Mr Higgins commented on 1 February that "per previous discussions" the screen height should be "as Malcolm is at the area adjacent to the passenger in order to minimise risk on occupant safety testing". Mr Allen checked the height of the UCS screen, probably from 2-D drawings in Contour's digital library, and reported that it was 40.7" above the plinth. He attached drawings illustrating how the height of the Solar Eclipse screen could be lowered to conform to the height of the UCS screen. In elevation the top edge of the privacy screen was broadly horizontal from the interface with the principal seat to the point at which it began to wrap round the ottoman. From there it curved downwards before meeting a short vertical downstand. The illustrations that Mr Allen produced were plainly not styling drawings, not least because they simply took a slice from the top of the screen which cut through the housing for the IFE monitor. Mr Allen commented to Mr Gentry that, as Mr Gentry had suspected, a reduction in height would mean that the position of the monitor would have to be lowered. What ultimately happened was that the height of the monuments was reduced to 41"; and they were slightly recessed in order to accommodate a 43" screen. The screen itself was not lowered to the same height as UCS.



120. Mr Friess and his colleagues evidently had further discussion with Future Brand. On 8 February 2005 an internal e-mail within Contour recorded that Air Canada had:

“been convinced by FB that the foot end of the screen should be more virginesque.”

121. As Mr Dryburgh pointed out in evidence, the screen at the foot end of UCS stopped short of the ottoman, which was a separate piece of furniture, whereas the screen in the Acumen design wrapped round the ottoman which was an integral part of the whole unit. To make the Acumen design “more virginesque” would therefore entail removing part of the screen altogether and, perhaps, having a separate ottoman with its own backshield. The design team resisted this. Thus when on the following day Acumen provided Contour with two new series of redesigns, Mr McKeever said in his covering e-mail:

“Please find attached two PDF’s. [One] shows initial radical screen reduction studies (including comments on why we don’t feel like they are successful) and the other shows some preliminary styling concepts based around our recommended approach for reducing the visual mass of the screen as it wraps around the ottoman.

We feel that by reducing the screen any more than shown in our preliminary styling PDF or moving towards a separate ottoman (a la virgin and suggested by Future Brand) then we will lose some of the features that make this product superior to the Virgin product. For example we will lose the improved foot protection around the ottoman area and more importantly the cocktail area and lower shelf. It might also have an impact on the under ottoman stowage size/volume.”

122. One series of the redesigns showed a screen stepping down towards the ottoman. The other showed more flowing curves. Acumen were quite irritated at having to produce two series of redesigns and hoped that Air Canada would choose one of the second series; and that is what happened. Air Canada preferred what was called “Concept 3”. This design retained the privacy screen that wrapped around the back of the ottoman. The covering e-mail, in my judgment, shows two things which corroborate the evidence given by Mr Dryburgh and Mr McKeever. The first is that Future Brand’s suggestion was (or was understood by Acumen at the time to be) moving towards a separate ottoman. That is what “virginesque” or “a la virgin” meant in shorthand. The other is that Acumen already had their own recommended approach for reducing the bulk of the screen where it wrapped round the ottoman.

123. A review meeting took place at Contour’s offices in Camberley on 16 and 17 February 2005. It was attended by representatives of Contour, Acumen and Air Canada. The meeting reviewed the mock ups which had been modified in the screen design. Mr Dryburgh emphasised that Contour and Acumen had seat design expertise; and that Future Brand did not. The meeting reviewed several styling concepts that Acumen had produced. They discussed aisle width and noted that in plan view the Virgin aisle was narrower. The day finished with a brainstorming session, which was later written up as part of the minutes of the meeting. A

significant part of the brainstorming session (to judge from the written record) was concerned with comparing Solar Eclipse with UCS. The second day of the meeting was split into two. One session considered issues of certification. The other considered styling issues. The overall purpose of the Camberley meeting was to prepare for another meeting with Air Canada in Montreal at which Acumen would have the chance to rebut Future Brand's criticisms.

124. On 25 February 2005 Mr McKeever sent Mr Duffy at Contour a Powerpoint presentation showing revised styling options. Mr Duffy asked who was doing the words "which shoots down the FB issues". He was told that Mr McKeever, Mr Dryburgh and Mr Roots were doing that. Mr Duffy replied:

"From Contours side the main thing to emphasise is the patent infringement issues. Air Canada cannot have a virginesque seat because of some areas which need to differ."

125. Non patent issues were that the privacy level was higher, it was less complex and the bed length was longer.

126. The meeting to deal with the issues raised by Future Brand duly took place at the beginning of March 2005. It began with a slide presentation by Contour of the advantages of the Solar Eclipse over the UCS. These included: wider aisles, wider access points from the aisle to the PAU; a longer suite; greater flexibility of the reclining seat; the provision of an adjustable leg rest; the provision of an electric pillow; the ability to turn the seat from seat mode into bed mode without the passenger having to get up from the seat; the ability to swivel the table so that a passenger could get out of his seat without having to stow the table; a greater volume of personal stowage space; dedicated laptop stowage; increased passenger protection from aisle traffic because of the integrated privacy screen and ottoman. The advantages of UCS included a greater nominal seat width; a larger table; and a better headrest profile. At the meeting Mr Bettell of Contour highlighted the benefits of the Solar Eclipse over UCS; and Mr Dryburgh presented in detail the differences between both and the reasons why the Solar Eclipse was designed in the way that it was and why it should remain as designed. Despite Mr Dryburgh's robust defence of Acumen's design, it was decided that the screen shape would be reworked to provide more shoulder room.

127. A further meeting took place between 8 and 10 March 2005. Mr Allen of Contour raised the question of decompression requirements. The minuted answer was that:

"There are no floor vents. The Dado venting is the only area to be considered. ACA to request from Boeing the baseline venting requirements. At present it is envisaged that Virgin style grilles will be fitted to the outboard seats."

128. Discussions about the screen continued into the spring. On 22 March Mr Roots raised a number of concerns about knock-on effects on the whole PAU that lowering the screen would have. On 15 April Mr Duffy of Contour advised Air Canada against changing the screen plan profile.

129. As Mr Allen worked on the LOPAs he made a number of changes to the LOPAs that Acumen had originally supplied. A few of the more important changes are as follows:
- i) For the Boeing 767-300, the Acumen LOPA showed the suites at an angle of  $36^\circ$  pitched at  $43.66''$ . Mr Allen reduced the pitch to  $43.5''$ , in order to ease standard manufacture of the plinth. He also made adjustments to the suite positions to obtain sufficient clearance for the monuments;
  - ii) For the Airbus A330-300 the Acumen LOPA showed the outboard suites at an angle of  $49.2^\circ$  pitched at  $33.94''$ . Mr Allen modified the angle to  $43^\circ$  and the pitch to  $37.5''$ . The adjustment of the angle had the knock-on benefits that the rotation of the seat allowed decompression gaps and also widened the aisle. He also modified the angle of the central suites from  $40.6^\circ$  to  $43^\circ$ .
130. At the end of June 2005 Mr McKeever began work on LOPAs for Jet Airways. Jet would in due course take a version of the seat which is called Solar Premiere.
131. In July 2005 Mr Allen came across a problem in designing the interface between the edge of the plinth on which the seat would rest and the sidewall of the aircraft, which was an Airbus. He had designed the plinth for UCS and went back to the 2-D drawings to see how he had solved the problem in a way that had satisfied Airbus for certification purposes. He wanted to adopt the same solution for the Solar Eclipse, because what had worked once would work again. He recorded that:
- “I’ve kept the same outboard profile as used on Virgin so hopefully this will be acceptable this time.”
132. In the event, however, the plinth for Solar Eclipse was thicker than the plinth for UCS, so the interface had to be redesigned. Thus the same outboard profile was not kept. In addition, Airbus had “tweaked” the interior surfaces of the aircraft in its latest manifestation which necessitated a different interface.
133. The Solar Eclipse seats were provided by Contour to Air Canada in November 2005 and the first deliveries took place in August 2006.

### **Wholesale copying: conclusions**

134. I now summarise my conclusions on the allegation that there was wholesale copying of UCS:
- i) The Cathay Pacific LOPA was not copied into the 13 May LOPA. At most what was taken from it was the general idea of an inward herringbone configuration, although even that was something that Acumen had previously considered briefly before rejecting it;
  - ii) The principle of an angle of installation greater than  $18^\circ$  had already been established in the blue sky concept presented in April;
  - iii) The seat position in the 13 May LOPA was carried into the 14 May LOPA as a result of the independent sidewall assessment, but the other details of the design were different;

- iv) Mr Dryburgh and Mr Gentry discussed some aspects of the UCS, but when they discussed the seat mechanism, they decided not to use the UCS mechanism;
- v) Consideration was given to lowering the height of the privacy screen to match the height of the UCS screen, but that option was rejected;
- vi) Consideration was also given to making the screen more “virginesque” but the design team successfully resisted that suggestion;
- vii) When a problem arose in relation to the interface between the aircraft sidewall and the plinth, Mr Allen referred back to what he had done in relation to the design of the plinth for UCS, but he changed the plinth and its interface with the aircraft sidewall.

135. I therefore reject the allegation of wholesale copying.

### **The individual designs**

#### *The ottoman shape*

136. There are three pleaded designs that relate to the ottoman. They are:

- i) The shape of the ottoman end section;
- ii) The shape of the shield at the rear of the ottoman;
- iii) The combination of the shape of the ottoman end section and the shield at the rear of the ottoman.

137. The allegation is that these designs were copied in the design of the shape of the ottoman and the kickplate in the design of Solar Eclipse. It is, however, agreed that the first two of these designs are excluded from design right by the so-called “must fit” exception, and that the real complaint relates to the combination of the two.

138. In his report Mr Moreno said that a designer did not have to use an ottoman at all. But many of the examples he gave were of seats that were not fully flat beds (e.g. Virgin Atlantic’s J2000), and he accepted in his oral evidence that in order to compete any new seat would have to be fully flat. In cross-examination he also accepted that the conventional way of achieving this was by means of an ottoman or footrest. Mr Moreno then suggested that the designer could use a fold down or powered ottoman. In fact Acumen toyed with both of these; and as Professor Darbyshire pointed out a powered ottoman is likely to carry too much weight to be acceptable in business class. Mr Moreno then pointed to a number of different shapes that had been used in designing ottomans. But his examples were all outward facing herringbones or forward facing seating arrangements, where the design constraints are different. This was an instance of Mr Moreno not giving sufficient weight to the practicalities of aircraft seating design as opposed to theoretical designs. His approach in this respect significantly weakened the inference that he drew that what he saw as similarities could not be explained as the result of independent design choices.

139. Mr McKeever gave the details of the design process in paragraphs 31 and 32 of his first witness statement. He said that Acumen had done a lot of work on ottomans before, and that they went back to a number of their previous designs. He explained that he designed the curve of the ottoman to give as much bed length as possible when measuring the bed from the end of the headrest to the end of the ottoman; and that he designed the curve to blend the privacy screen smoothly around the ottoman as Acumen had done when designing the BA First in 1994. Part of the curve was also designed in order to blend with the tapered leg rest, which also had a curve. When the design moved on from the Cathay Pacific pitch, the bed was lengthened slightly and this had knock-on effects on both the size of the cocktail table and the curve of the end of the ottoman where the radius was extended. None of this evidence was shaken in cross-examination.
140. Mr McKeever's oral evidence was that the end of the ottoman was designed as an asymmetric shape in order to accommodate the greatest possible bed length, not least because the seat back was short. The ottoman (including its asymmetric shape) was always designed as fully integrated into the wrap-around privacy screen and unlike UCS was not conceived as a freestanding piece of furniture. That part of the privacy screen that wrapped around the ottoman not only protected the passenger's feet from aisle traffic, it also acted as the support for the cocktail tray of the next door passenger.
141. Mr Dryburgh's evidence was that a tapered ottoman was almost inevitable in an inward facing herringbone. Whenever an ottoman is placed against an aisle or side wall, it has to be tapered in order to accommodate the straight line. Professor Darbyshire broadly agreed. He explained that it was almost essential to have an ottoman of some sort. To try and achieve a flat bed using no more than a seat with an extendable leg rest was impractical. First, the leg rest would have to cantilever so far that a robust (and heavy) mechanism would be needed to actuate it. Second, the time that it would take to move the seat into bed mode (and vice versa) would be unacceptably long for a business class passenger. Third, a cantilevered leg rest that did not protrude underneath the seat in front would be liable to be broken by someone standing or sitting on it. Thus although it was a theoretical possibility it was a very unlikely design choice. Professor Darbyshire then considered the shape of the ottoman. His view was that although it was theoretically possible to have a symmetrical ottoman in an inward facing herringbone, it was a most unlikely choice for a designer who wanted to maximise the available bed space, to use the maximum space on the aircraft and at the same time meet regulatory requirements. Thus an asymmetric curved ottoman was an obvious design choice given the constraints under which a designer of an inward facing herringbone was working. One reason for this is that in the case of an ottoman bordering the aisle a curved end is likely to produce less disturbance for the passenger if the end of the ottoman is struck by a trolley being manoeuvred down the aisle. In addition he considered that a competent designer did not choose the shape of the ottoman merely because it was aesthetically pleasing. As he explained:

“You do not create an ottoman shape because you think it is the right shape. The shape is about delivering the space that a passenger's feet can exist within and then part of a seat unit that fits to the aircraft in the most efficient form.”

142. Finding the right curve could be an intricate job, or it could be done very quickly.
143. It is also the case that the curve adopted for the Solar Eclipse does not have the same dimensions or radii as the curve of the ottoman in the UCS. It is also designed to fit the overall curve of the privacy screen to which it is attached; and that in turn is designed as an integral part of the overall PAU incorporating the cocktail tray. Professor Darbyshire said that even a difference of half an inch can mean the difference between a seat fitting or not fitting into an aircraft.
144. I accept the evidence of Mr Dryburgh, Mr McKeever and Professor Darbyshire. I find that the end curve of the ottoman was not copied from UCS, but was an independent design choice in the context of an inward facing herringbone.

*Ottoman backshield*

145. UCS has a separate ottoman which is certified for use as a secondary seat. It has a separate backshield. In Solar Eclipse the ottoman is not certified as a secondary seat. It is attached to the privacy screen which wraps round both it and the side of the PAU. The kick panel is simply a plastic strip attached to the interior face of the privacy screen in order to stop it being damaged by passengers' feet. Professor Darbyshire considered that the "whole philosophy" behind the two designs was "very different".
146. Mr McKeever set out the design process in paragraphs 33 and 34 of his first witness statement. When Acumen presented its design to Cathay Pacific, the privacy screen wrapped round the ottoman but did not incorporate a kick panel. As the design moved on Air Canada were concerned about possible damage by passengers' feet; and asked for a removable kick panel to be included. In fact the kick panel appeared at a very late stage.
147. In the designs that were reviewed by Future Brand at the end of January 2005 there was still no kick panel shown; and at that stage Future Brand did not suggest one. However, the notes of the meeting in Camberley on 16 and 17 February 2005 contain a section entitled "Notes on Styling Direction". Under the heading "Areas to work on" the notes say:

"Ottoman foot protection on screen"

148. This appears to be the origin of Air Canada's request. The kick panel first made its appearance in the styling concepts that Acumen prepared for the meeting of March 8-9 2005, some three weeks later.
149. As Mr McKeever explained in his witness statement the kick panel is designed in order to fit the curvature of the ottoman end and of the privacy screen in which it sits. The kick panel is taller than the UCS ottoman backshield, and this gives it different proportions. Mr McKeever designed the height of the kick panel to correspond to the height of the cocktail table, the arm rest height and the top of the main table when stowed. These correspondences between the kick panel and other elements of the PAU make it unlikely to have been copied from UCS. None of the dimensions, radii or curvatures of the kick panel are the same as those of UCS. In addition the overall shape of the curved top is similar to the freestanding backshield that Acumen presented to Cathay Pacific in April 2004. Again Mr McKeever's evidence on this

point was not shaken in cross-examination. I accept it; and find that the kick panel was independently designed.

*The combination of the ottoman and backshield*

150. The principal reason why this design was pleaded and relied on was to overcome any possible defence based on the so-called “must-fit” exclusion. It was not suggested that any different facts were relevant to the creation of this combination. My findings of fact about the individual designs of the ottoman curve and the kick panel therefore apply to this combination.

*The central privacy screen*

151. Virgin Atlantic relies on its design of its own central privacy screen (i.e. the screen that divides seat units in the central columns of the aircraft). However, the infringement that it alleges is Contour’s wall privacy screen (i.e. the screen that divides seat units adjacent to the side wall of the aircraft).
152. The privacy screen in an inward facing herringbone has two essential functions. First, as its name suggests, it provides privacy between individual passengers. In designing such a screen there is a balance to be struck between a feeling of privacy and a feeling of claustrophobia. Second, the screen is required to house the necessary accessories that a business class passenger expects: IFE monitor, IFE controls, table, reading light and so on. These features to some extent influence (if they do not dictate) its width and size.
153. Mr McKeever described the design in paragraphs 35 to 38 of his first witness statement. He said that Acumen did not design a central privacy screen for the Cathay Pacific project. They designed a wall screen which was later adapted to use as much as possible for the central screen design. The origin of the Cathay Pacific screen was the screen designed for the presentation in April 2004. When the overall design was changed from an outward facing herringbone to an inward facing herringbone as much of the packaging as was possible was carried forward.
154. The starting point of Virgin Atlantic’s factual case of copying is the form of the privacy screen on the 13 May LOPA. It is true that the simple arcs represented on that LOPA terminating at the front edge of the seat pan do resemble the UCS privacy screen. However, by the following day, the shape of the screen on the 14 May LOPA had been markedly changed; and it now adopted the principle of a screen that wrapped round the ottoman. Mr McKeever’s evidence, which I accept, was that the inspiration for this principle was the work that Acumen had carried out for BA.
155. Mr Moreno’s consideration of the similarities between the two designs started from the premise that a privacy screen was not a necessary choice at all. But he resiled from this in cross-examination. He accepted that a privacy screen was a necessary component of an inward facing herringbone. However, his view was that the “flowing shapes” of both screens were sufficiently close as to lead to an inference of copying.
156. Professor Darbyshire pointed out two fundamental differences between the Solar Eclipse privacy screen and the UCS screen. One of these was constructional, and

does not go to the real issue. But the other is a matter of design. As Professor Darbyshire explained UCS has a compound curve so that the screen curves both in horizontal section and also in a direction away from the passenger as one goes from the plinth upwards. In other words in the vertical direction the UCS screen bends away from the passenger. This gives the passenger a much greater feeling of space. However, it is a much more complex screen to construct than one which is vertical with simple curves, like the Solar Eclipse screen. He also pointed out that both the UCS screen and the Solar Eclipse screen had, in plan view, a curve which curves forward in the direction of flight in the area near the passenger's head (albeit with different curves). However, he demonstrated, convincingly to my mind, why the provision of a curve in that position in an inward facing herringbone would be obvious to any competent designer. If the privacy screen were curved, a useful space would be created between the curve of the screen and the left of the passenger when seated, whereas if the screen were straight the same space would be behind the seat and essentially useless.

157. The footprint of the Solar Eclipse screen is larger than UCS, partly because of the fact that it is not integrally attached to the seat. It is also taller than the UCS screen even after Future Brand's intervention. The UCS screen is continuously curved, whereas the Solar Eclipse screen begins as a curve, then becomes straight, but thickening in order to accommodate the monitor and table, and changes again into another curve in the opposite direction to the first curve to wrap round the ottoman. The UCS screen ends just forward of the front edge of the seat pan and the ottoman backshield is a separate item. As mentioned, the Solar Eclipse screen is integrated. Moving up the screen from its interface with the plinth, the UCS screen is of a uniform thickness, whereas the Solar Eclipse screen changes with its height. It incorporates projections and recesses at various heights. Professor Darbyshire also pointed out that the actual curves of the UCS and the Solar Eclipse are different and considered that a designer who attempted to copy would make things more difficult for himself rather than easier.
158. Mr McKeever explained a number of features of the design of the screen. He wanted to make the screen as thin as possible, but had to thicken it in the central section to accommodate the monitor and table. The outward face of the thickened section was angled towards the passenger so that it could accommodate the IFE handset and seat controls. That central section has no curvature in order to maintain a constant tolerance between the deployed seat mechanism and bed cushions. The height of the screen was determined by the size and number of components that it was required to house. That was one reason why it was not possible to lower the height of the screen to the extent that Future Brand would have wished. The screen was required to have a padded section on the top edge. This was a regulatory requirement in order to prevent injury to passengers from head impact in the event of a crash.
159. As has been seen during the course of the narrative, the original elevation of the privacy screen was relatively flat before it dropped down to wrap round the ottoman. This was one of the features that Future Brand disliked; and it was changed. But I find it impossible to say that in making that change Acumen copied UCS. It is here I think that the elevations on which Virgin Atlantic relied give a misleading impression of the real article. They flatten the curve which is a dynamic flowing curve which not only descends from the top of the screen towards the ottoman but also bends round to



envelop it. Acumen provided a number of different possibilities for Air Canada to choose from and in my judgment they were the product of independent design. Mr Meade relied strongly on the statement by Air Canada that they wanted a more “virginesque” end to the screen. But that overlooked a number of factors. First, Acumen and Contour were very resistant to that suggestion and went out of their way to defend their design. Second, Contour was alive to patent issues as one reason why Air Canada could not have a more “virginesque” design. Third, the “virginesque” feature of the screen was that it did not wrap around the ottoman, and the wrap-around screen was retained in Acumen’s design. Fourth, any attempt to incorporate a curve derived from the UCS screen would have aesthetically compromised the design. Fifth, as Professor Darbyshire pointed out the transition from the mainly horizontal to the mainly vertical is often accomplished by a curve. It is an obvious design choice. Professor Darbyshire summarised his overall conclusion as follows:

“They have different heights, different combination of shapes, different sets of requirements. One also, the Virgin screen is also set including the angle of flight into it, so once you rotate it down it would become even more different as well.”

160. I accept the evidence of Mr McKeever and Professor Darbyshire. I find that the screen was a product of independent design.

*Combination of privacy screen and ottoman end section*

161. There is a superficial similarity between the combination of the privacy screen and the end of the ottoman in UCS and the screen in Solar Eclipse. It must not be forgotten, however, that whereas the design in UCS is a real combination; the design in Solar Eclipse is a part of the integrated privacy screen. The privacy screen was designed as a whole. Moreover, as Professor Darbyshire explained, superficial similarities of this sort are heavily influenced by functional requirements. As he put it:

“I would say that they are similar but they are a long way from being the same and they are fulfilling a similar function dividing two seats out; which means that they will become more similar. Whoever is designing them is looking to minimise their thickness in plan view and the shape to which you have to fit to the cabin, the width of the seat that you need to deliver, the space that a passenger's feet needs to fulfil a proper footstool, is going to lead you down a very common path. If you were to then take these and put them on the aircraft in the positions they actually sit, I think you would see an even increased difference upon these and which you can read by the angle of the end of the screen at the top of the drawing; because that dictates and gives you an idea of how displaced in angle these things really are to each other in reality.”

162. This answer was also significant in reinforcing the point that the drawings can mislead about the reality. In the course of his re-examination Professor Darbyshire drew attention to the fact that the shapes are different; the positions are different; and

that there were very big differences in physical size and positioning from a design perspective.

163. On the basis of my findings of fact I conclude that the privacy screen in Solar Eclipse was independently designed; and was not a copy of the combination in which Virgin Atlantic claim design right.

*The Passenger Accommodation Unit*

164. The design on which Virgin Atlantic rely is the design of a single cabin wall PAU at 49°. It comprises a seat unit, a plinth, a privacy screen, an ottoman including an ottoman backshield, and various inserts surrounding the seat unit. The PAU as defined by the pleading includes the privacy screens on each side of the seat unit. The particular features relied on in combination are:

- i) A reclining seat configured at an angle to the central longitudinal axis of the aircraft which abuts the privacy screen, whereby the curvature of the privacy screen is followed by the curvature of the ottoman and ottoman backshield;
- ii) The flat surfaces around the seat unit and between the seat unit and the privacy screens on each side;
- iii) A plinth which follows the curvature of the privacy screen to which the seat, a privacy screen and the ottoman are attached;
- iv) The position of the reading light on the privacy screen to the immediate left or right of the seating unit;
- v) The position of outward facing monitor screens on the privacy screen
- vi) The decompression grille behind the seat unit.

165. The fact that a PAU must accommodate all these features (seat unit, reading light, monitor, and decompression grille) as well as other features (literature pocket, lifevest, stowage for luggage etc) is a basic requirement of a business class seat, as Mr Moreno accepted. Where the seating arrangement is an inwards facing herringbone, Mr Moreno also accepted that a privacy screen is required. In the case of any seating arrangement which is not parallel to the seating tracks (which themselves are parallel to the longitudinal axis of the aircraft) a plinth is required in order to fix the seat and its accessories to the seating tracks. So the mere existence of these features in Solar Eclipse is not evidence of copying: it is evidence of satisfying commercial and regulatory requirements. The angle of installation of Solar Eclipse is not 49°. Mr Allen's unchallenged evidence was that in some aircraft it is 36°. In others it is 43°.

166. In their final submissions the central thrust of Virgin Atlantic's case on this design was that the PAU was largely defined by the provision of the Cathay Pacific LOPA, the briefing on that document and "the subsequent adoption of the inward facing herringbone". In so far as this alleges the copying of the Cathay Pacific LOPA, I have dealt with that and rejected the allegation in the course of the narrative. In so far as it is alleged that the adoption of *any* inward facing herringbone is an infringement of Virgin Atlantic's design of the PAU, the allegation is pitched at too conceptual a

level. Moreover, a LOPA (which is essentially a ground plan) will not show the detailed positions of monitor, reading lights, plinths or decompression grilles; and the positioning of the decompression grilles is anyway largely a matter of engineering rather than design.

167. I have already dealt with the privacy screen and its curvature. I simply reiterate at this point that the overall concept of the integral privacy screen wrapping round the end of the ottoman is quite different to the Virgin Atlantic design.
168. The arrangement of seats in a herringbone will inevitably leave a triangular space between the seat and the aircraft wall. This is dictated by simple geometry, whether the herringbone is inward or outward facing. There will also be spaces between the edges of the seat and the privacy screens if the latter are curved. As Professor Darbyshire pointed out, not only are these useful areas within the confines of aircraft cabin design, it is also necessary to cover them with inserts in order to prevent objects falling into the seat mechanism and cabling below. This evidence was not challenged in cross-examination.
169. As I have said, in the case of angled seating a plinth is necessary. The plinth in the present case was designed by Mr Allen. The design of the plinth itself does not appear to have been any part of Acumen's work, but was essentially an engineering issue. In his report Mr Moreno did not give any evidence about the plinth or its significance. In conceptual terms the Solar Eclipse plinth is different from the plinth in UCS. Mr Allen explained this in his witness statement. He said that the Solar Eclipse plinth operated on a different principle and was made to a different design as compared with the UCS plinth. In the UCS, the primary fixing of the screen assembly and the rear console is to the seat structure itself, (rather than to the plinth), and it is the seat structure itself which is then fixed to the plinth. The ottoman and ottoman backshield is an independent assembly which is independently fixed to the plinth. In the Solar Eclipse, the seat structure attaches to the plinth separately to the other furniture in the unit, i.e. the screen assembly and the rear console. In addition the ottoman is a component of the screen assembly rather than being an independent assembly by itself. The internal structure of the Solar Eclipse plinth did not use the same 'hoop' design as the UCS (which was a feature of the plinth design necessitated by the fact that the UCS ottoman had to be certified as a secondary seat). The Solar Eclipse design only required a relatively low strength attachment for the ottoman as the attachment loads are shared with the screen assembly, which is also attached to another part of the plinth. Once again this is unlike UCS where the screen assembly is attached to the side of the main seat structure and shares the same attachments to the plinth. With no requirement for a high strength attachment for the ottoman the Solar Eclipse plinth employs a more open assembly of straight aluminium alloy structural beams arranged to provide maximum support to the seat only. These are also much easier to manufacture than the curved composite beams used for the UCS hoop structure.
170. In addition, whereas in UCS the privacy screen is situated behind the passenger and is attached to the plinth behind, on the Solar Eclipse plinth the privacy screen is situated forward of the passenger seat and attached to the same plinth as that passenger's seat. The Solar Eclipse plinth also had a ramped edge to enable the passenger to access the seat from the aisle, whereas the UCS plinth does not. The solution that Virgin

Atlantic adopted was to raise the level of the aisle so that it was at the same level as the surface of the plinth.

171. What seemed to cause the excitement as far as the plinth was concerned was the reference by Mr Allen in his e-mail of July 2005 that he had kept the “same outboard profile as Virgin”. In fact, as Mr Allen explained in his oral evidence in chief, the plinth was redesigned partly because it was thicker than the UCS plinth and partly because Airbus had “tweaked” its specification. Mr Allen’s evidence about this was not challenged in cross-examination.
172. It is not entirely clear what Virgin Atlantic’s case about the reading light is. The suggestion that Mr Meade put to Mr McKeever in cross-examination is that this detail was copied from UCS when Acumen changed the original outward facing herringbone presented to Cathay Pacific in April 2005 to the inward facing herringbone presented in June. In their final submissions Virgin Atlantic drew attention to what they said were differing accounts of how the final position of the reading light came to be determined. In fact the accounts are not, to my mind, inconsistent at all. The general location of the reading light on the screen to the left of the passenger (as opposed, for instance, to a light on a stalk) was a constant throughout Acumen’s design. The precise location was partly influenced by wiring considerations. In addition, there is no evidence that Acumen had access to the details of the UCS design (and the position of the reading light would not have been deducible from the Cathay Pacific LOPA, or, indeed from a genuine Virgin Atlantic LOPA). As Professor Darbyshire pointed out positioning the light on the screen is an obvious place to put it. Mr Moreno did not specifically comment on the reading light in his report. However, he accepted in cross-examination that the shape of the elements housed in the Solar Eclipse screen (reading light, monitor and table) were of a different shape to the equivalent elements housed in the UCS screen and although some were in the same general area, they were in different positions. Since the monitor has to be easily viewed and the table has to be used while the passenger is seated, it is not in the least surprising that they are in the same general positions.
173. The meeting of 8 and 10 March 2005 had established that there were to be no floor vents for decompression. The venting was to be through the dados only. In fact decompression vents in the floor would have been difficult (although not impossible) in the case of a seating system in which the seats were attached to plinths. Venting via the dados made much better sense. The same meeting had also recorded that “Virgin style” grilles were to be used. Mr Gentry explained that the decompression vents are down at the interface between the floor of the aircraft and the side wall of the aircraft. If you are going to put in a grille, the only way to get the air down to that vent is along the wall of the aircraft, downwards. So it had to be in the position in which it was. Decompression grilles were in a similar position in BA First and American Airlines. Mr Meade relied in cross-examination on other PAU designs where a grille was concealed in the cabin furniture forming part of the PAU. However, those designs were outward facing herringbones, where the cabin furniture was itself disposed along the sidewall of the aircraft. Where the seating arrangement is an inward facing herringbone, all the cabin furniture is disposed inboard of the seat itself. Thus such a solution is not practical. Mr Moreno’s evidence in cross-examination was that the position of the decompression grilles was the “most convenient place” to put it. I think he also grudgingly accepted that it was the “most

likely” place, but he suggested that there were other possibilities. One of his suggestions was that it could have been placed in the footwell. Thus struck me as implausible, not least because a decompression grille in that area would be easily blocked. Mr Moreno’s evidence on this question was unimpressive, and was one of the areas in which his lack of practical knowledge of the design of aircraft seating was most apparent. Given the design of the other components of the PAU the position of the decompression units was the obvious choice. It is possible that there could have been some fine tuning of the precise position of the grille, but general location was not an indication of copying.

174. Mr Gentry explained the criteria for designing grilles. If you imagine you have a throat for decompression which is, say, 100 square inches and that is the maximum air flow you can get through somewhere. A grille has an efficiency, of say 70%. So, therefore, if you cover that 100 square inch hole with a grille, you not getting 100 square inches. You are only getting 70 square inches, but you may need all of that 100 square inches. Accordingly in order to raise the efficiency of the grille you increase the surface area either by making the grille concave or by making it convex. Contour had previous experience of concave grilles. The problem was that with a concave grille there was a risk of debris accumulating in the cavity thus blocking the grille. It was more sensible therefore to design a convex grille which reduced (even if it did not eliminate) that problem.
175. As Mr Moreno agreed in cross-examination, the actual dimensions and cross-sectional shape of the grille in UCS and the equivalent grille in Solar Eclipse are different.
176. Virgin Atlantic relied heavily on the minutes of the meeting in March 2005 in which it was recorded that “Virgin style grilles” would be fitted to the outboard seats. In my judgment this was no more than a shorthand reference to the location of the grilles. The detailed design of the grilles themselves was different. Moreover, the decompression grilles are only a very small part of the PAU; and no separate design right is claimed in the decompression grilles alone.
177. I have concluded that the PAU was independently designed.

#### *The 3 and 4 Passenger Accommodation layouts*

178. Mr Meade accepted during his final address that the multiple PAU configurations stood or fell with my decision on the individual PAU; and that I need not consider these designs separately. Since I have concluded that the individual PAU was independently designed, the claim in relation to these designs also fails.

#### **What Contour make**

179. Although I have decided that the claim for infringement of design right fails, I must nevertheless set out the facts about what Contour actually do, in case I am wrong in my conclusion. The facts were more or less common ground. They are relevant both to the case on design right and also to the case on patent infringement.
180. Contour manufacture and supply Solar Eclipse and its derivatives into individual passenger accommodation units PAUs. The manufacturing takes place in the United Kingdom at Contour’s premises in Cwmbran. They do not make delivery of

individual PAUs since it is more usual for customers to insist upon the full number of PAUs for a shipset to be delivered in one go. However the shipset itself is assembled in its herringbone form on board the aircraft to be fitted with the shipset. To date all such assembly has taken place outside the United Kingdom. The assembly itself is carried out by the aircraft manufacturer or the airline's appointed maintenance provider.

181. Before shipment Contour temporarily assembles a small number of seat units on the shop floor (and without attachment to aircraft seat tracks) so that the customer and aircraft manufacturer can inspect them. However an entire shipset is never assembled in the UK for this purpose.

### **The patent: principles of construction**

182. There is no dispute about the general principles of patent construction. The task for the court is to determine what the person skilled in the art would have understood the patentee to have been using the language of the claim to mean. The principles were summarised by Jacob LJ in *Mayne Pharma Pty Ltd v Pharmacia Italia SPA* [2005] EWCA Civ 137 and refined by Pumfrey J in *Halliburton Energy Services Inc v Smith International (North Sea) Ltd* [2005] EWHC 1623 (Pat) following their general approval by the House of Lords in *Kirin-Amgen v Hoechst Marion Roussel* [2005] RPC 9. An abbreviated version of them is as follows:

- i) The first overarching principle is that contained in Article 69 of the European Patent Convention;
- ii) Article 69 says that the extent of protection is determined by the terms of the claims. It goes on to say that the description and drawings shall be used to interpret the claims. In short the claims are to be construed in context.
- iii) It follows that the claims are to be construed purposively—the inventor's purpose being ascertained from the description and drawings.
- iv) It further follows that the claims must not be construed as if they stood alone—the drawings and description only being used to resolve any ambiguity. Purpose is vital to the construction of claims.
- v) When ascertaining the inventor's purpose, it must be remembered that he may have several purposes depending on the level of generality of his invention. Typically, for instance, an inventor may have one, generally more than one, specific embodiment as well as a generalised concept. But there is no presumption that the patentee necessarily intended the widest possible meaning consistent with his purpose be given to the words that he used: purpose and meaning are different.
- vi) Thus purpose is not the be-all and end-all. One is still at the end of the day concerned with the meaning of the language used. Hence the other extreme of the Protocol—a mere guideline—is also ruled out by Article 69 itself. It is the terms of the claims which delineate the patentee's territory.

- vii) It follows that if the patentee has included what is obviously a deliberate limitation in his claims, it must have a meaning. One cannot disregard obviously intentional elements.
  - viii) It also follows that where a patentee has used a word or phrase which, acontextually, might have a particular meaning (narrow or wide) it does not necessarily have that meaning in context.
  - ix) It further follows that there is no general “doctrine of equivalents.”
  - x) On the other hand purposive construction can lead to the conclusion that a technically trivial or minor difference between an element of a claim and the corresponding element of the alleged infringement nonetheless falls within the meaning of the element when read purposively. This is not because there is a doctrine of equivalents: it is because that is the fair way to read the claim in context.
  - xi) Finally purposive construction leads one to eschew the kind of meticulous verbal analysis which lawyers are too often tempted by their training to indulge.
183. Points were raised in connection with the reference numerals used in the claim. Both Mr Meade and Mr Vanhegan accepted as correct the statement of Laddie J in *Telsonic AG's Patent* [2004] R.P.C. 38 § 26 that:
- “Reference numerals ... are designed to be, and can be, useful tools to elucidate the inventor's intention. As such they may, depending on the circumstances, help to illustrate that the inventor intended a wide or narrow scope for his claim. On the other hand they cannot be used to import into the claim restrictions which are not foreshadowed by the language of the claim itself.”
184. This would, I think, be implicit in principle ii) anyway, since the drawings and specification (both of which contain reference numerals) must be used to interpret the claims. Moreover principle iv) says in terms that the drawings and description are not to be used merely to resolve ambiguities in the claims. They are part of the context in which the claim is read. In addition rule 29 (7) of the Implementing Regulations to the European Patent Convention provide that if the application contains drawings:
- “... the technical features mentioned in the claim shall preferably, if the intelligibility of the claim can thereby be increased, be followed by reference signs relating to these features and placed between parentheses. These reference signs shall not be construed as limiting the claim.”
185. Thus the reference signs are an aid to intelligibility of technical features of the claim itself. But the reference numbers alone cannot limit the claim.

186. Mr Meade had another point based on the division of the claim into a pre-characterising part and a characterising part. This division of the claim is derived from rule 29 (1) of the Implementing Regulations. That says:

“The claims shall define the matter for which protection is sought in terms of the technical features of the invention. Wherever appropriate, claims shall contain:

(a) a statement indicating the designation of the subject-matter of the invention and those technical features which are necessary for the definition of the claimed subject-matter but which, in combination, are part of the prior art;

(b) a characterising portion – preceded by the expression “characterised in that” or “characterised by” – stating the technical features which, in combination with the features stated in sub-paragraph (a), it is desired to protect.”

187. The argument is that anything in the pre-characterising part of the claim must be interpreted as describing the prior art. Accordingly any integer in that part of the claim cannot (or should not) be interpreted so as to claim some feature which is not found in the prior art. In my judgment this overstates the effect of the division of the claim into these two parts. The invention is defined by the claim: not by a part of the claim. The first sentence of rule 29 (1) makes this clear. There is no requirement in rule 29 (1) that the characterising part of the claim should alone set out the inventive step. I was not referred to any decision of the courts or the EPO to the contrary. Paterson on The European Patent System (2<sup>nd</sup> ed. § 7-58) quotes from case T13/84 as follows:

“Neither the Article nor the Rule makes any reference to the necessity or desirability that “the characterising portion of the claim should fairly set out the inventive step. The contention by the Appellant seems to be based on the false conception that the inventive step resides in the characterising portion of the claims. It is, however, the subject-matter of the claim as a whole which embodies the invention and the inventive step involved.”

188. Thus the monopoly claimed by the patent is to be determined by interpreting the claim as a whole; and, moreover, interpreting it in the context of the specification and drawings. This is what Article 69 of the European Patent Convention and section 125 of the Patents Act 1977 require.

### **The experts on patent issues**

#### *Mr Moreno*

189. Mr Moreno was Virgin Atlantic’s expert on patent issues as well as on design. His reading of the patent in suit was conditioned by the instruction he had been given that it did not claim a flip-over seat. Paradoxically, Mr Moreno’s comparative lack of experience in designing aircraft seating made him a better witness when it came to



considering whether design changes were obvious. When he considered the prior art citations in his written evidence he did so thoroughly and carefully. His insistence, in relation to design right issues that a designer should avoid the conventional made him more susceptible to accept suggestions put to him in cross-examination about how a designer might “play about with” a piece of prior art. But Mr Moreno, in my judgment, found it hard in his oral evidence to inhabit the mind of an unimaginative designer; and I have evaluated his answers in the light of this.

*Mr Chapman*

190. Mr Tom Chapman was Contour’s expert on patent issues. He is neither a designer nor an engineer; but has spent his career working for United Airlines as a program manager dealing with interior cabin design. In other words he was the commissioning client. His contact with both designers and engineers was, so to speak, at second hand. This led him, in my judgment, to underestimate the practical difficulties of making modifications to the prior art.

**The skilled addressee**

191. There is much common ground about the identity of the notional skilled addressee who, in this instance, is a team. The team is a team of aircraft and transportation designers comprising designers and engineers with a knowledge or aircraft seats in general, and in particular reclining aircraft seats. The team members would include:

- i) Members skilled in designing aircraft layouts and fitting seats and units into such layouts;
- ii) Designers and engineers with at least first degree level and actual experience;
- iii) Some members with experience in the regulatory side of aircraft seating layouts and ancillary items such as crash testing and stresses, the transfer of loads from seats to the aircraft structure, and decompression requirements.

192. The team may also include operators of commercial civil aircraft, although nothing turns on this addition to the team.

**Common general knowledge**

193. Again there is much common ground about the common general knowledge that the team would possess. It includes:

- i) Familiarity with concepts of mechanics, engineering and trigonometry;
- ii) A high degree of competence with CAD design software;
- iii) Knowledge of and access to airframe manufacturer’s specifications and requirements;
- iv) Knowledge of dimensions for typical seat units;

- v) Knowledge and understanding of aircraft seat design acquired from previous projects or passed on by colleagues' experience or by access to archive materials;
  - vi) Knowledge of certification authorities and familiarity with certification requirements. This included the knowledge that the regulators allowed the placing of seats at an acute angle to the axis of the fuselage of up to 18° without the need for any additional safety restraint, but that the placing of seats at a greater angle would involve greater safety features (although not necessarily precisely what those additional safety features would be);
  - vii) Good working knowledge of seat installation criteria issued by Boeing and Airbus.
  - viii) Knowledge of the main, commercially successful business and first class seats. These would have included, in particular: BA First, BA Yin Yang business class; AA Signature; United First and Virgin J2000;
  - ix) Knowledge of seating units comprising a reclining seat, a privacy screen, an ottoman or footstool, providing a passenger with a PAU within the aircraft cabin;
  - x) Knowledge of seating units in which the seat reclined to form a flat bed;
  - xi) Knowledge of the general objectives in designing business class and first class seats. One of these was the need to make use of all available space within the aircraft cabin, although the relative importance of this varied from class to class;
  - xii) Knowledge of *outward* facing herringbone seating arrangements. Whether knowledge of *inward* facing herringbone seating systems was common general knowledge is in dispute.
194. At this point I should refer to the classic description of common general knowledge in *General Tire & Rubber Co v Firestone Tyre & Rubber Co Ltd* [1972] RPC 457. In that case the Court of Appeal approved a statement of Luxmoore J that:
- “It is certainly difficult to appreciate how the use of something which has in fact never been used in a particular art can ever be held to be common general knowledge in the art.”
195. They also said that something was unlikely to be part of common general knowledge unless it was generally regarded as a good basis for further action.
196. Although the idea of an inward facing herringbone was not new, because it had been around for some time, it had never been put into practice before. There was a brief mention of the possibility of an inward facing herringbone in the trade press (Aircraft Technology Engineering & Maintenance) in 1999. Acumen certainly knew of the idea, because they had proposed it to BA. Mr Moreno agreed in cross-examination that the idea of an inward facing herringbone would have been known to the skilled person. I quote the exchange:

“Q. ... as a matter of fact, as the tool box of knowledge which the typical skilled person would have as at August 2001 he would know or she would know that the concept, the idea of having an inward-facing herringbone for arranging your seats was known to that person. Do you agree?”

A. Yes.”

197. This, however, was only an idea. It had not in fact been done before. Mr Vanhegan suggested that this was for purely commercial reasons, and that the reasons why it had never been done were also common general knowledge. Mr Moreno was, in my judgment, more equivocal about whether this was part of common general knowledge at the relevant date. I am not persuaded that it was. Thus I accept Mr Meade’s submission that although the idea of an inward facing herringbone may have been known it was not generally regarded as a good basis for further action. It is not, therefore, part of common general knowledge.
198. There was also an issue about whether common general knowledge would have included knowledge of the contents of patents or patent applications. None of the individual experts professed to have personal knowledge of patents or patent applications as part of their routine knowledge. Even allowing for the fact that the experts agreed that the skilled person was a team, I do not consider that the contents of patents or patent applications would have formed part of the team’s common general knowledge. In the end this became common ground.
199. Despite this large measure of common ground Mr Moreno was at times inclined to take a very literal view of what a document disclosed, rather than to read it through the eyes of the skilled addressee possessed of common general knowledge. One example will suffice for the moment. The question arose whether the reader of an item of prior art would have understood that an angled seat would be fixed to the aircraft by means of a plinth. Mr Moreno would not accept that the skilled reader would have understood that. His evidence puzzled me; and the following exchange took place:

“MR. JUSTICE LEWISON: Can I just see if I have understood this? I think I have been told, Mr. Moreno, that there are two parallel fixing tracks?”

A. That is correct, my Lord.

Q. And one could, I suppose, fix the legs that one sees in Fig 5 to each of the two, one to each of the fixing tracks?

A. That is correct.

Q. But would you not have to fix the privacy screens as well?

A. Yes.

Q. What would you fix them to?

A. Well, you would have to fix it to a plinth. You cannot attach anything to the floor of the aircraft.

Q. If you are fixing the privacy screens to a plinth, would you not fix the seat to the same plinth?

A. It could be, but I cannot say from this drawing.”

200. It seemed to me to be obvious that the seat and the privacy screen would be fixed to a plinth, and that the skilled person would appreciate that without having to be told.

### **The 908 patent**

201. The 908 patent describes the invention, which it calls “a novel seating system for a passenger vehicle, particularly an aircraft and a seating unit for a passenger seating system.” It begins, in conventional terms, by describing the problem the patentee is setting out to solve. It describes the prior art. Among the prior art systems that it describes (paragraph [0004]) is a fully reclining seat which forms a “generally” flat horizontal surface. However, it points out that:

“the surface is still not ideal because the foam or other padding on the seat is generally sculptured for use as seat whereas for a bed it is desirable to have substantially flat surface.”

202. In paragraph [0006] it describes the BA First seat (patent GB-A-2326824 A). It points out that the BA First seats are positioned at an acute angle to the longitudinal axis of the fuselage:

“so as to define a generally triangular or trapezoidal space to the front or rear of each seating unit (according to whether the seating units face outwards or inwards relative to the cabin). The space is used to accommodate a counter-top to one side of an adjacent seating unit and optionally cupboard or other storage space.”

203. It goes on to point out, in the same paragraph, that the BA seating system:

“... has the advantage that by incorporating an additional, secondary seat in the flat sleeping surface together with the back-rest, seating portion and leg-rest of the primary seat, it is possible to form a long seating surface which is able to accommodate comfortably passengers having a height of greater than 6ft (1.83m).”

204. However, it asserts that BA First suffers from three disadvantages:

- i) It requires more cabin space than a conventional layout of seats;
- ii) The seat cushioning is designed principally for use as a seat and not as a bed (the same disadvantage that it had referred to in paragraph [0004]);

- iii) The seat itself occupies a very large floor area and is therefore unsuitable for use in business class.
205. The patent moves on to describe Yin-Yang. This seating arrangement is also said to be extravagant in use of space; and the bed is too short to accommodate tall passengers. It, too, has the disadvantage that the cushioning is not specifically designed for use as a bed. Having described the prior art, the patent next sets out the objects of the invention, which can be summarised as follows:
- i) To provide improved accommodation in business class incorporating a flat sleeping surface of maximal length and preferably maximal width;
  - ii) To provide an improved passenger accommodation unit adapted to provide self-contained individual seating and sleeping accommodation, particularly for use in business class;
  - iii) To provide a passenger accommodation unit which can be converted into a bed of maximal length;
  - iv) To provide a seating system which optimises use of space within the cabin;
  - v) To provide a seating system which has a substantially uncrowded appearance.
206. Paragraph [0017] then describes the invention in more detail:

“According to the present invention, there is provided a passenger seating system for an aircraft, comprising a plurality of seat units, each seat unit defining a notional longitudinal seat axis and comprising a supporting structure adapted for attaching the seat unit to a floor of an aircraft and means forming or being configurable for forming a seat comprising a seat-pan and a back-rest, said seat units being arranged to form a column defining a notional longitudinal column axis, in which column said seat-units are arranged side-by-side in longitudinally off set relation at an acute angle to the notional column axis, thereby defining a space to the rear of each seat, each seat unit further comprising means forming or being configurable for forming a substantially flat bed, so that when the seat unit is formed into a bed a major proportion of the bed is disposed forwardly of the position that was occupied by the seat (Seating system of the type disclosed e.g. in GB-A-2 326 824), and characterised in that the flat-bed extends rearwardly into said space behind the seat. The invention also provides seat unit for such a passenger seating system.”

207. The first sentence of this passage is the basis of claim 1. The seat unit itself, referred to in the second sentence, is the basis of claim 13. Paragraphs [0019] and [0020] taught that the seat units could be positioned in an inwards facing herringbone. Paragraph [0022] taught that preferably each seat unit comprised a foot rest “positioned forwardly of the seat”. This could be used as a foot rest and also for another passenger to sit on whilst visiting the occupant. Paragraph [0025] described

another preferable feature of the seat unit. This is a fixed, passenger supporting element in the space at the rear of the seat, which is used when the seat unit is in bed mode. It is generally triangular or trapezoidal. Paragraph [0026] describes an equivalent passenger supporting element to the side of the seat, which also forms part of the flat bed when the seat unit is in bed mode. The patentee summarises his invention in paragraph [0027]:

“The present invention thus provides a seating system which is particularly suited for a business-class cabin of a passenger aircraft. The seating system of the present invention provides individual seat units having back-rests and seat-pans and optional foot-rests to allow passengers to rest their legs in an elevated position during flight. Each seat unit is provided with self-contained means for forming substantially flat bed and the use of space within the cabin is optimised by positioning the flat bed to extend rearwardly behind the seat into a space defined by the arrangement of the seat units.”

208. The patent goes on to discuss the various angles to the axis of the aircraft at which the seating units may be arranged. It continues by describing specific embodiments of the invention. Paragraph [0038] describes a “seat unit”; an important term which will reappear in the claims. The description is as follows:

“Each seat unit 40 comprises supporting structure 42 for attaching the seat unit to the floor 30. ... Each seat unit 40 has front end 51 rear end 52 and two opposing sides 53, 54.”

209. The supporting structure (42) is the base of the seat; the front end (51) is the part of the ottoman closest to the aisle; the rear end (52) is the sidewall of the aircraft and the two opposing sides (53 and 54) are the faces of the privacy screens on each side of the passenger. Paragraph [0042] continues this theme:

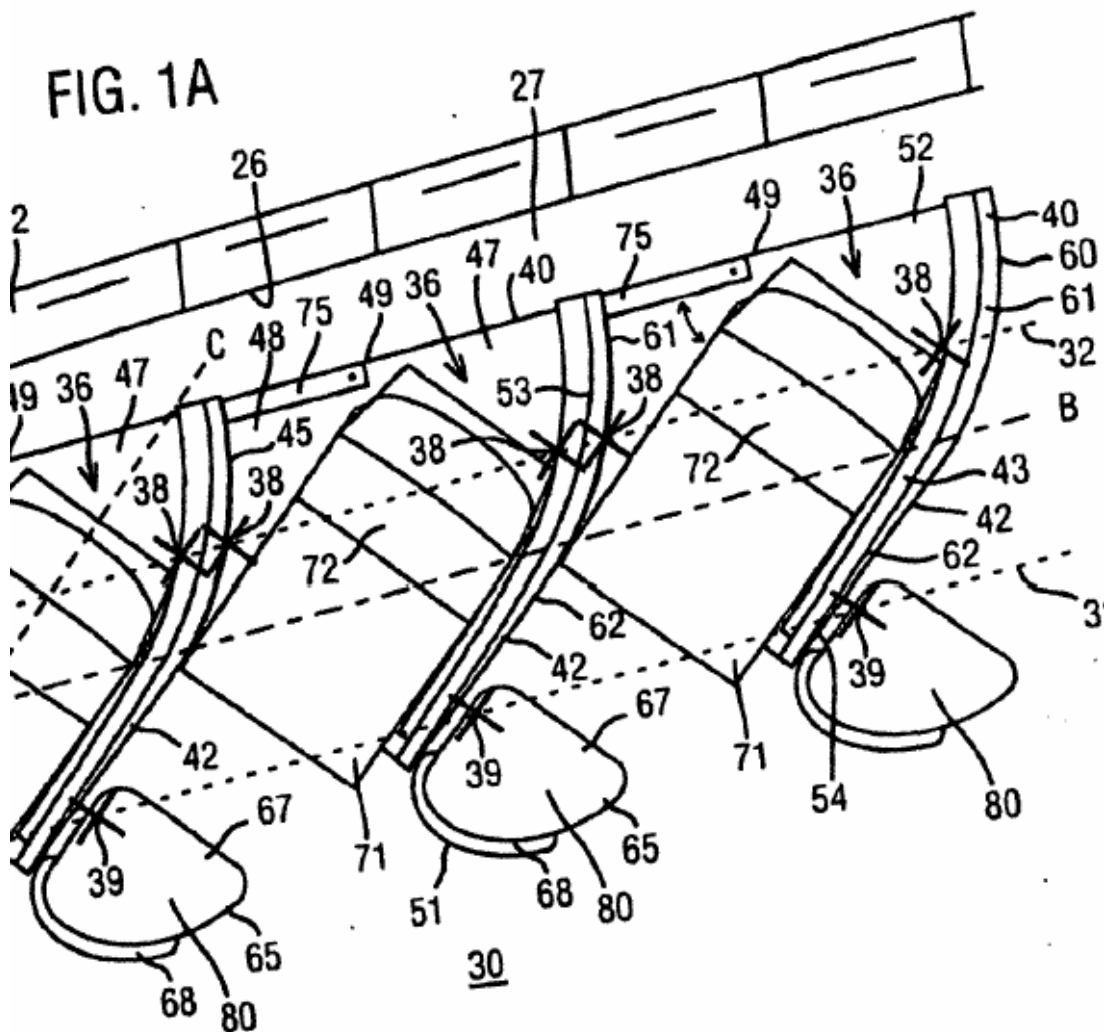
“As perceived by passenger using the seat unit 40, therefore, the seat unit 40 defines a notional longitudinal seat axis which extends between the front and rear ends 51, 52 of the seat unit 40 and is indicated in FIG 1A by the dashed line C-C.”

210. Paragraph [0043] describes the seat in the upright position. The seat pan (71) is substantially at the same level as the two surfaces of the housing (47, 48) and the cushion of the ottoman (67) provides a foot rest. The back rest (72) reclines. The cushion of the ottoman provides a foot rest for the passenger in this mode. Paragraph [0044] goes on to describe the transformation into bed mode. The back rest comprises a front surface (73) and a rear surface (74). In seat mode the front surface (73) of the back rest and the seat pan (71) combine to form the seat. As paragraph [0044] goes on to explain:

“In the bed configuration, as shown in the left-hand seat unit of FIG 2 the back-rest is rocked forwardly relative to the seat unit and is partly accommodated within the cuboidal recess 44 such that the rear surface 74 of the back-rest 72 is substantially coplanar with the first and second surfaces 47, 48 and with the

cushion 67 of the ottoman 65. The rear surface 74 of the back-rest 72 is also substantially continuous with the second surface 48 and cushion 67 in the bed configuration. The seat movement mechanism includes a moveable infill element 76, as shown in FIG 1A, which is moved from a stowed position to a deployed position when the seat is converted from the seat configuration to the bed configuration. In the bed configuration, the infill element 78 is disposed intermediate and substantially co-planarly and contiguously with the rear surface 74 of the back-rest 72 and said first surface 47. In the bed configuration, the seat unit 40 thus provides an extended bed surface for the passenger, the bed surface being extended rearwardly of the seat by the first surface 47, laterally of the seat by the second surface 48 and forwardly of the seat by the cushion 67 of the ottoman 65."

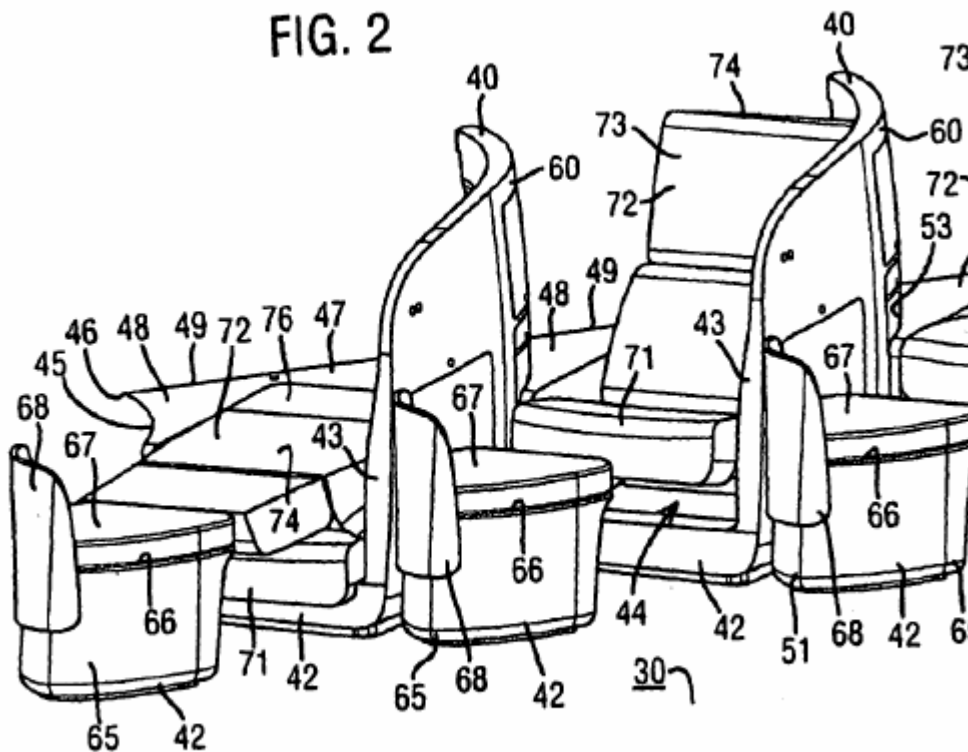
211. The layout of the seating units is most clearly shown by Figure 1A of the patent part of which I reproduce. This is a plan of part of the cabin when the seating units are in seat mode.



212. The particular points to note in this figure are:

- i) The limits of the seat unit (40). These are the front, consisting of the part of the ottoman closest to the aisle (51); the sides, consisting of the faces of the privacy screens (53 and 54) and the back, consisting of the aircraft sidewall (52);
- ii) The seat pan (71) and the seat back (72) are both described as comprising the “seat”; but neither are referred to in the elements of the bed; which consist of the rear surface of the back rest (74), the infill panel (78), the cushion of the ottoman (67) and the surfaces (47 and 48). The rearward extension of the bed is achieved by the first surface (47); the lateral extension of the bed is achieved by surface (48) and the forward extension by the ottoman cushion (67).

213. Figure 2 illustrates the seats themselves both in seat mode and in bed mode. I reproduce part of it:



214. It will be seen that the seat pan (71), which forms the surface of the seat when the seat unit is in seat mode, drops down below the bed when the seat unit is in bed mode; so that it forms no part of the bed. The back rest (72) is shown both when the seat unit is in seat mode and also when it is in bed mode. But whereas when the seat unit is in seat mode it is surface (73) which faces the passenger; in bed mode it is the rear surface (74) which faces the passenger. This is the so-called “flip-over” seat. In



effect it pivots forwards. There is thus a gap between the seat back and the triangular area behind the seat, and this is filled by a moveable infill panel (76).

215. I was shown a working example of the Virgin Atlantic UCS. When it turns from seat mode into bed mode the seat pan drops down and the seat back pivots forward so that the rear surface of the seat back presents as the upper face. The passenger is then able to stretch out along a surface formed by the padded triangular areas to the rear and side of the seat, the rear surface of the seat back, the infill panel and the surface of the ottoman.

216. For the purposes of this trial the parties agreed that claim 1 as drafted is more easily understood if its integers are slightly rearranged. The agreed rearrangement is as follows:

“(a) A passenger seating system for an aircraft, comprising a plurality of seat units (40);

(b) each seat unit;

i. defining a [single, fixed] notional longitudinal seat axis (C-C); and

ii. comprising a supporting structure (42) adapted for attaching the seat unit to a floor (30) of an aircraft (12); and

iii. means forming or being configurable for forming a seat comprising;

a) A seat pan (71); and

b) A back-rest (72);

iv. further comprising means forming or being configurable for forming a substantially flat bed (47, 48, 67, 74, 76) **[this feature appears later in the claim but refers to the seating unit]**;

(c) said seat units being arranged to form a column (29) defining a notional longitudinal column axis (B-B), in which column said seat-units are arranged side-by-side in longitudinally offset relation at an acute angle to the notional column axis (B-B);

(d) wherein at least some of the said seat units are arranged to be disposed adjacent a sidewall (26, 28) of the aircraft and face inwardly thereby to define between the rear of each seat and the sidewall a space (36) when the seat is configured as a seat;

(e) so that when the seat unit is formed into a bed a major proportion of the bed is disposed forwardly of the position that was occupied by the seat,

and characterised in that;

(f) the flat-bed extends into said rearward space (36) behind the seat.”

217. The words in square brackets are words that Virgin Atlantic wish to add by way of amendment.

### **Issues of construction of the patent**

*Each seat unit defining a notional longitudinal seat axis C-C*

218. The issue arising under this integer is whether the claims encompass swivelling seats. The relevance of this issue is that if the claims do encompass swivelling seats, then Contour allege that the claim is anticipated by some of the prior art. If the claim does not encompass swivelling seats, then that prior art is irrelevant.

219. Contour argue that:

- i) What is said to define the longitudinal axis is not the seat, but the seat unit. Even if the seat within the seat unit swivels, the seat unit itself will define a single longitudinal axis. It is also for that reason that Contour argue that Virgin Atlantic’s proposed amendment (namely to insert the words “single fixed” before the word “longitudinal”) does not overcome the problem, because the longitudinal axis is still defined by the seat unit, rather than the seat.
- ii) The claim under consideration is the claim that applies to the United Kingdom. That claim is restricted to *inward* facing herringbones. The reason for the limitation is given by the patentee in paragraph [0005] of the specification, namely the publication after the filing date of the patent application of the American Airlines patent. It was a novelty only citation. The American Airlines patent disclosed a swivelling seat in an *outward* facing herringbone. If Virgin Atlantic had intended the patent in suit not to encompass swivelling seats the swivelling feature of the seat, rather than the inward facing herringbone, would have been the obvious limitation to introduce into the claim applicable to the United Kingdom. Since, however, Virgin Atlantic chose to limit the claim by reference to the inward facing herringbone rather than the swivelling seat, it must be inferred that swivelling seats were intended to be included in the claim.

220. Virgin Atlantic argue that:

- i) The claim does not expressly mention swivelling seats, and nor does the specification;
- ii) When describing the preferred embodiments, the specification describes the flip-over seat; in particular in paragraph [0044] which I have already quoted. It is also the flip-over seat that is illustrated in the figures. All the embodiments show the seat unit and the seat as co-axial;

- iii) The axis defined by the seat unit is not the axis of the seat unit but the axis of the seat (“seat axis”). The axis thus defined is a single axis (“a ...longitudinal seat axis”). A swivelling seat would not have a single longitudinal axis but multiple longitudinal axes, depending on the position into which the seat was swivelled. Another way of putting this point is that the axis of the seat unit and the axis of the seat are assumed to be the same;
- iv) One of the objects of the invention is to optimise the use of space within the cabin. A swivelling seat is far space-hungrier than a fixed seat, and it would contradict one of the stated objects of the invention to include swivelling seats;
- v) The pre-characterising part of claim 1 tracks very closely the description of the invention in paragraph [0017]. As the reference to the BA First patent in that paragraph makes clear, the draftsman regarded BA First as including all the integers of the pre-characterising part of the claim. That paragraph refers to the BA First patent as disclosing “a plurality of seat units, each seat unit defining a notional longitudinal seat axis”. This is exactly the same language as this integer of the claim. BA First was not a swivelling seat. It is not suggested that the characterising integer of the claim itself prescribes a swivelling seat.

221. On this question of construction I accept Virgin Atlantic’s submissions, although I do not place weight on the argument about BA First. I hold therefore that the claim does not cover swivelling seats. I do not consider that any amendment is necessary.

*each seat unit...further comprising means forming or being configurable for forming a substantially flat bed (47, 48, 67, 74, 76)*

222. The issue arising under this integer is whether the claim is limited to flip-over seats (or what Contour has called the “True Bed Meaning”). If the claim is so limited then it is common ground that there is no infringement.

223. Contour argue that:

- i) In a number of places when describing the prior art the patent specifically points out that a disadvantage of the prior art using a reclining seat is that it uses sculpted seat cushioning that is not specifically designed for use as a bed. If the patentee was not setting out to overcome this disadvantage there can have been no point in mentioning it;
- ii) In fact the first object of the invention (paragraph [0011]) was to provide “a flat sleeping surface”;
- iii) The claim requires that the seat unit (not the seat itself) “further” comprises means forming a substantially flat bed. This implies that the seat unit must include an additional element or elements which are different from those that form the seat itself and that it is those further elements that form or are capable of forming the flat bed. This interpretation is reinforced by paragraph [0027] of the patent which refers to “self-contained means” for forming the bed. The contrast between the elements forming the seat means and the elements

forming the bed means is clearly foreshadowed by the contrast in language between integer (b) (iii) and integer (b) (iv);

- iv) The reference numbers in the claim identify those parts of the seat unit that form the bed. They do not include the seat pan or the front face of the seat back. Thus the reference numerals support an interpretation of the claim as limited to a “flip-over” bed. This is consistent with the way in which the bed is described in paragraph [0044] of the specification;
- v) It is the seat unit rather than the seat that is formed into a bed;
- vi) When the seat unit is in bed mode then according to integer (e) a major portion of the bed is forward of the position that “was” occupied by the seat. If this is simply describing a reclining seat the past tense is inexplicable, because in bed mode the seat (either the seat pan or the seat back) will still be occupying the position the seat occupied in seat mode;
- vii) If the claim encompasses simple reclining seats where the passenger sleeps on the seat-back and headrest (as opposed to flip-over seats) it is impossible to see how the flat-bed extends into an area “behind” the seat (as claimed by integer (f)). The flat bed *is* the seat (or at least part of it).

224. Virgin Atlantic on the other hand argue that:

- i) The words of the claim simply require that as well as having elements which can form a seat, each seat unit also (“further”) has elements which can form a substantially flat bed. That is all. There is no requirement that the elements forming the bed be completely distinct from the elements forming the seat;
- ii) The disadvantages of the prior art are not carried forward into the objects of the invention;
- iii) The preferred embodiments do not illustrate separate elements;
- iv) It is illegitimate to use the reference numbers to limit the scope of the claim;
- v) The manner in which the claim is separated into a pre-characterising clause and a characterising clause, read in the context of paragraph [0017] of the specification, makes it clear that the patentee considered that all the integers of the pre-characterising parts of the claim were present in BA First. Since BA First did not have flip-over seats, the patentee cannot be taken to have limited the claim to flip-over seats in the pre-characterising part of the claim. This integer is in the pre-characterising part of the claim and cannot therefore be taken to be limited to flip-over seats.

225. I do not agree with Virgin Atlantic that the elimination of the disadvantage of sleeping on sculpted seating formed no part of the object of the invention. On the contrary, as Contour argue, it was the first of the stated objects. Nor do I agree that the preferred embodiments do not illustrate separate elements. In my judgment it is plain that they do. I do not find that the use of the word “further” (“further comprising means”) to be a clear pointer in favour of Virgin Atlantic’s construction. The natural reading of that

word is, in my judgment, a pointer the other way. The conventional meaning of the word is “additionally”; and the context does not, to my mind, suggest that the patentee was using the word other than in its conventional meaning. The fact that it is the seat unit, rather than the seat, which must “further” comprise the bed means seems to me to emphasise that the claim is speaking of something different from the seat itself. I agree also with Contour that integer (e) also reinforces the impression that the bed means are not the same as the seat. I also find it difficult to see how a simple reclining seat can extend the bed into an area behind the seat as claimed in integer (f). This could only be achieved by reading additional words into the claim such as “the flat-bed extends into said rearward space (36) behind *the space that was occupied by the seat when in seat mode*”.

226. At best, from Virgin Atlantic’s standpoint, the word “further” is ambiguous. But in that event it is clear that the reference numerals in the claim itself (as well as the specification and drawings) can be used to resolve the ambiguity. And they point clearly to a separation between the seat and the bed means.
227. What then of the division of the claim into a pre-characterising and a characterising part? There are two reasons why I do not accept Mr Meade’s point. One is, as I have already said, that I think he overstates the effect of this division; and in any event the cross-reference to BA First is not repeated in the claim itself. The second is that Virgin Atlantic’s interpretation itself produces a mismatch with integer (f) which is the characterising part of the claim.
228. I hold therefore that this integer of the claim bears the True Bed Meaning. Although I do not rely on it (because questions of construction are for the court alone) I am comforted that my interpretation coincides with the interpretation of the claim by Contour and Acumen when trying to design round the patent. Since one of the objectives of the interpretation of claims is to provide reasonable certainty for third parties, the way in which a real skilled third party interpreted the claim before any question of litigation arose is some indication of how the notional skilled reader would have understood it. My construction also coincides with the interpretation given to the claim by Mr Chapman. I should add that Mr Moreno had been instructed that the flip-over seat had been protected by a different patent; and so he approached the patent in suit on the basis of having been instructed that it did not bear the True Bed Meaning. He did, however, agree that the patent was teaching that the disadvantage of a reclining seat not providing a flat surface could be overcome by the claimed invention. That is some indication that, left to his own devices, he would have interpreted the patent in the way that I have.
229. As I have said it is common ground that if this integer of claim 1 is interpreted in the way that I have interpreted it, then the patent in suit is not infringed. Thus the infringement claim fails.

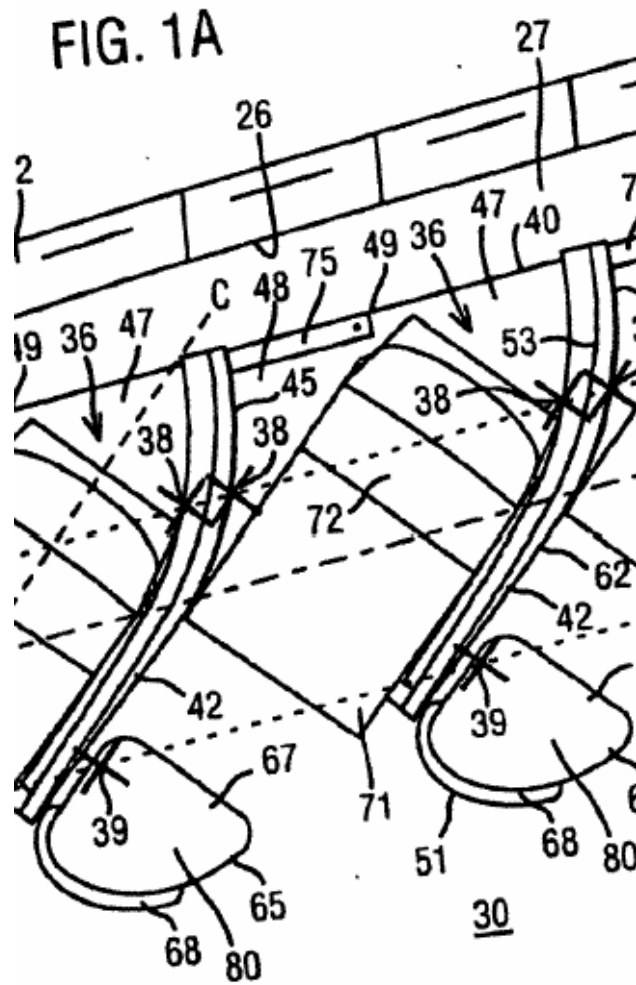
*when the seat unit is formed into a bed a major proportion of the bed is disposed forwardly of the position that was occupied by the seat*

230. The issue arising under this integer is whether “a major proportion” means more than half. If it does then it is common ground that there is no infringement. If it does not, then there are further issues of what a major proportion is, and how it is to be measured.

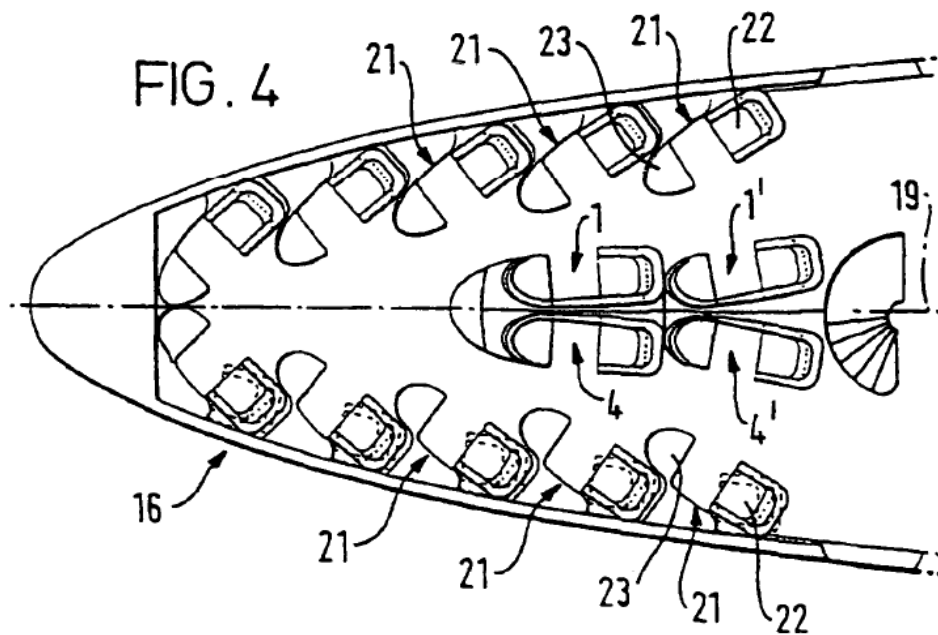
231. Contour argue that unless “a major proportion” means more than 50 per cent, it is quite unclear what it does mean.
232. Virgin Atlantic, on the other hand argue that the phrase in the claim is “a” major proportion; not “the” major proportion. If the phrase had used the definite article, there might have been some linguistic merit in Contour’s argument. But it did not. Thus to describe BA as “a” major airline does not imply that BA carries more than 50 per cent of the world’s passengers; any more than to describe the Labour Party, the Conservative Party and the Liberal Democrats as major political parties means that any one of them commands more than 50 per cent of the vote. Virgin Atlantic thus argue that “a major proportion” means no more than a significant proportion. In my judgment this interpretation is supported by a number of considerations:
- i) The patentee has deliberately eschewed a fixed proportion. The use of imprecise descriptions (“substantially”, “large”, “thin”) is common in patent claims. In other claims in the patent in suit the patentee has deliberately specified particular angles or ranges of angles. The choice of “a major proportion” was a deliberate one to avoid a fixed proportion.
  - ii) Although the drawings of the preferred embodiments are not to scale, when the seat unit is in bed mode only about 30 per cent of the bed is forward of the position that was occupied by the front edge of the seat pan. Mr Chapman agreed that this was so. It would be odd, to say the least, if the preferred embodiments did not fall within the claim.
  - iii) There is no practical difference in taking the benefit of the invention whether 47 per cent of the bed or 50 per cent of the bed is forward of the seat when in bed mode. Mr Chapman agreed that this was so.
233. Questions relating to how you measure the proportion seem to me to arise whatever “a major proportion” means. I do not, therefore, consider that questions of the measuring point take the essential argument any further.
234. On this point I prefer Virgin Atlantic’s arguments.

*wherein at least some of the seat units are arranged to be disposed adjacent a sidewall of the aircraft and face inwardly thereby to define between the rear of each seat and the side wall a space when the seat unit is configured as a seat and the flat bed extends into said rearward space behind the seat.*

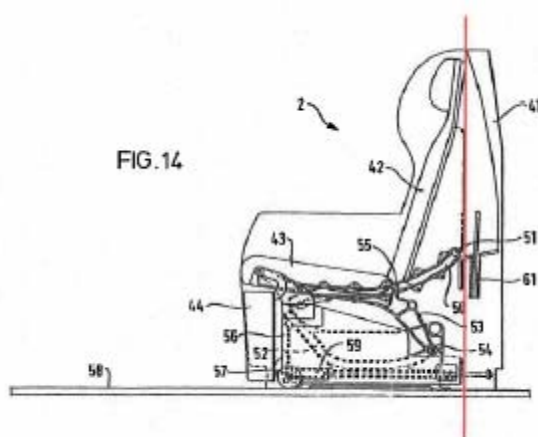
235. The argument about this integer is relevant to anticipation; and in particular anticipation by BA First. It is probably easier to understand the significance of the point by illustrating the space in question both in the patent in suit and also in the BA First patent. The BA First patent, in one of its embodiments, illustrates an inward facing herringbone. It also illustrates a cross-section through the seat unit both in seat mode and in bed mode.
236. First the patent in suit where the space in question is designated by reference numeral (36):



237. Next the BA First patent where a space behind the seat unit is designated by reference numeral (21).

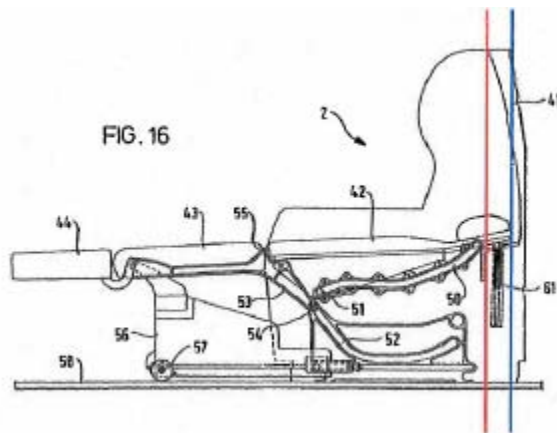


238. Contour's argument is that the skilled person would understand that the purpose of this part of the claim is that there is an area within the seat unit but behind the seat and close to the sidewall of the aircraft which, while not used as part of the seat, may effectively be used as part of the bed to permit elongation of the bed without increasing the seat pitch (along the axis of the aircraft fuselage). This is consistent with the patent seeking to provide a high passenger density whilst also providing a substantially flat bed. Thus if the seat when in bed mode uses any space between the sidewall of the aircraft and the seat back when in the upright position, it will fall within this integer. This is illustrated by the BA First patent, and in particular by the cross section through the seat. Figure 14 in the BA First patent shows the seat in seat mode.



239. The vertical line is an addition to show where the rear of the seat back is when the seat is in seat mode. Rear of that line is space within the shell that surrounds the seat. Figure 16 in BA First illustrates the seat when reclined into bed mode:





240. It will be seen that approximately half the head rest is now disposed rearward of the vertical line which marked the rear of the seat back when in seat mode. Contour argue that that half of the headrest occupies part of the space between the seat (not the seat unit) and the sidewall of the aircraft.

241. Virgin Atlantic argue that the space to which this integer refers is not a space inside the seat; but is limited to a space that is formed as a result of the arrangement of seats in an inward facing herringbone. In effect, therefore the space in question is the equivalent space to that designated by reference numeral (21) in the BA First patent. Virgin Atlantic's interpretation is, in my judgment, supported by the following considerations:

- i) The use of the word "thereby" indicates that the space in question is defined as a result of the arrangement of seats in an inward facing herringbone. The space between the rear of the seat back and the shell in BA First exists however the seat is placed within the aircraft;
- ii) The space in question is identified by the reference numeral (36) which identifies the triangular or trapezoidal space between the back of the seat and the side wall of the aircraft;
- iii) The description of the BA First patent in paragraph [0006] of the specification identifies the same space in BA First as being used for a counter top or a cupboard; and it is that space that reappears in the consistory paragraph [0017] in the description of the BA First patent.

242. I prefer Virgin Atlantic's arguments on this point.

### **Subsidiary claims**

#### *Claim 2*

243. In essence this claim is a claim to an inward facing herringbone of the type claimed by claim 1; but where the seats are arranged back to back in the central column of the aircraft. Its principal relevance is to anticipation.

*Claims 4 to 6*

244. These claims claim inward facing herringbones at specific angles of installation. Claim 4 is to 30° to 60°; claim 5 is to 40° to 50°; and claim 6 is to 45°. Their principal relevance is to anticipation and obviousness. No question of interpretation of these claims arises

*Claim 9*

245. Claim 9 claims a seating system as claimed:

“wherein each seat unit further comprises a foot-rest (65) that is positioned forwardly of the seat [and which extends upwardly from the floor].”

246. The issue here is whether, as Virgin Atlantic argue, this claims an ottoman only, or whether, as Contour argue, it also claims a moveable footrest that is mechanically connected to the structure which supports the seat pan and seat back. This issue is relevant to the question of anticipation. The words in square brackets are an amendment proposed by Virgin Atlantic if they are wrong on construction.

247. In my judgment Virgin Atlantic are correct. The foot-rest is not part of the seat itself, which claim 1 defines as consisting of the seat pan and the back-rest alone. The foot rest is something that “is” positioned forwardly of the seat; not something which “is capable of being” positioned forwardly of the seat. To my mind that suggests something which occupies a fixed position. In addition the foot rest is introduced by paragraph [0022] of the specification. That says:

“Preferably each seat unit further comprises a foot-rest that is positioned forwardly of the seat. Said foot rest can thus be used by an occupant of the seat to support his or her feet in-flight in an elevated position and/or by another passenger to sit on whilst visiting the occupant. Provided that such foot-rest is provided it has been found that passengers do not require the seat unit to incorporate movable leg-rest as part of the seat-forming means.”

248. Thus the foot-rest is described by way of contrast with (and substitution for) a moveable leg rest of the conventional type. In addition it is very unlikely that the skilled reader would understand that a conventional leg rest would be capable of being used as a seat by another passenger, since it would have to be independently certified for safety purposes as a seat.

249. Any ambiguity is resolved by the reference numeral (65) in the claim itself which clearly refers to the ottoman.

250. I therefore prefer Virgin Atlantic’s arguments on this point. I do not consider that any amendment to this claim is necessary.

## Validity

251. On the basis of my conclusions so far, namely that the patent is to be interpreted as having the True Bed Meaning, Contour do not challenge its validity in these proceedings. (There are other possible grounds for challenge elsewhere with which I am not concerned). If, however, the patent is infringed by a reclining seat, then Contour say that the patent is invalid on the grounds of anticipation, obviousness and added matter. In view of my conclusion on interpretation, I can take these matters relatively shortly in so far as they are themselves matters of interpretation which a higher court can determine for itself. However, I need to find facts on the question of obviousness.

## Anticipation

252. Section 2 of the Patents Act 1977 provides:

“(1) An invention shall be taken to be new if it does not form part of the state of the art.

(2) The state of the art in the case of an invention shall be taken to comprise all matter (whether a product, a process, information about either, or anything else) which has at any time before the priority date of that invention been made available to the public (whether in the United Kingdom or elsewhere) by written or oral description, by use or in any other way.”

253. There are two requirements for a claim to be anticipated by a prior document: disclosure and enablement. The matter relied upon as anticipating the patent must disclose subject-matter which, if performed, would necessarily result in an infringement of the patent. Whenever subject-matter described in the prior disclosure is capable of being performed and is such that, if performed, it must result in the patent being infringed, the disclosure condition is satisfied. It does not matter that the person performing that subject-matter appreciates that what he is doing will infringe: *Synthon’s Patent* [2006] RPC 10, § 22.

254. Although a number of citations of prior art were pleaded, Mr Vanhegan only relied on three in his closing address.

## The prior art

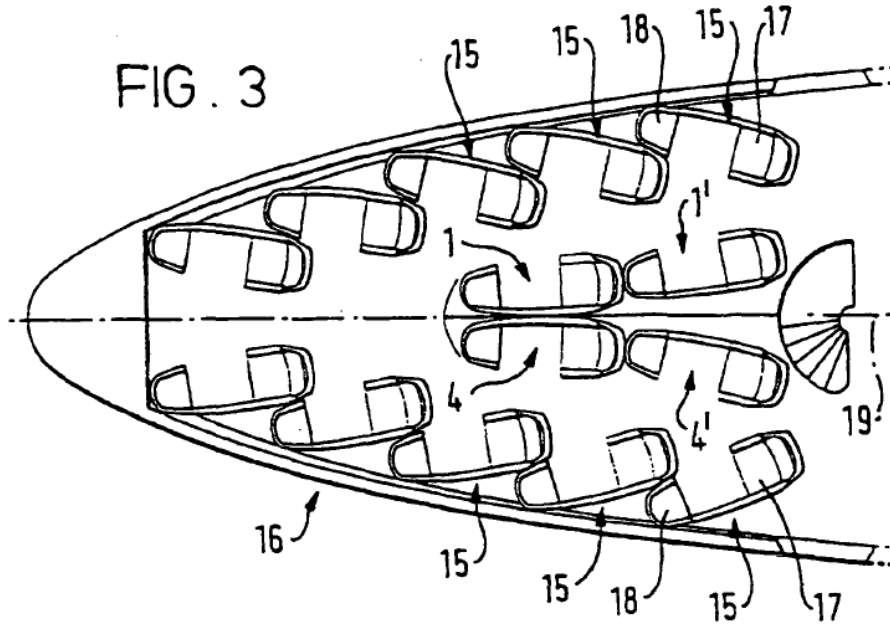
### *BA First*

255. BA First described the seat as:

“... a seating unit comprising a fixed housing containing a primary seat with a reclinable back, wherein the back is arranged to recline in such a manner that it remains within the housing.”

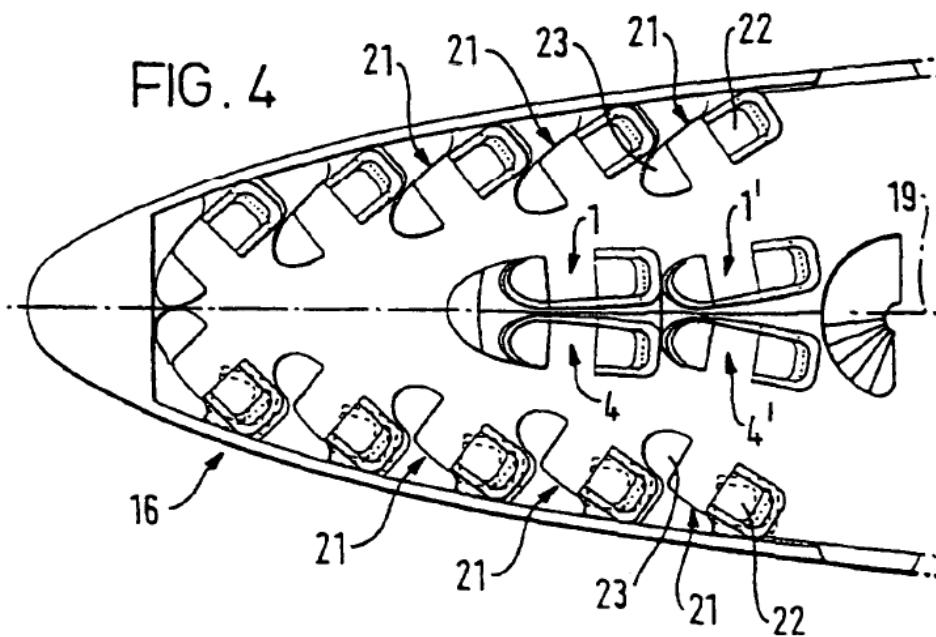
256. It also described a “secondary seat” (i.e. an ottoman). It continued by describing a herringbone arrangement of seats, which provided greater privacy for passengers;

allowed screens to be placed between the seats “to define the extent of each passenger’s domain”; and enabled more seats to be provided within the cabin without any perceived loss of individual passenger space. BA First illustrated an outward facing herringbone as follows:



257. The seat unit is denoted by the reference number 17. The triangular space between the seat and the sidewall of the aircraft is denoted by reference numeral 15.

258. BA First also illustrated in inward facing herringbone as follows:



259. The seat unit is denoted by the reference numeral 22; and the triangular space between the seat and the sidewall of the aircraft is denoted by the reference numeral 21. The dotted lines in the seats in the lower column of seats indicate that they are swivelling seats, as the text explains. Two of the seats in the middle column are forward facing and the remaining two are arranged in an outward facing herringbone. I have already illustrated the cross-sections of the seat in both seat mode and in bed mode. As between the two arrangements, BA First teaches that:

“The choice whether to use an inboard-facing arrangement or an outboard-facing arrangement is arbitrary because there are no significant cost advantages to either arrangement over the other arrangement. Preliminary research has shown that the outboard-facing arrangement is likely to be preferred by passengers because it provides a greater sensation of privacy than does the inboard-facing arrangement.”

260. In my judgment BA First does not anticipate claim 1 because:

- i) It discloses a reclining seat rather than a true bed;
- ii) The reclining seat when in bed mode does not extend into a space that is defined as the result of an inward facing herringbone arrangement;
- iii) The reclining seat when in bed mode does not extend rearwardly behind the seat: it is the seat.

261. It is common ground that BA First does not anticipate claim 2. Although it was originally contended by Contour that BA First anticipated claims 4 to 6, Mr Chapman fairly conceded in cross-examination that this was the result of a confusion of axes. He had looked at the longitudinal axis of the aircraft, whereas the patent in suit requires looking at the longitudinal axis of the seat column. In a parallel section of the aircraft this makes little, if any, difference. But BA First illustrated the nosecone, where the two axes differ.

262. If (contrary to my view) BA First does anticipate claim 1, I think that it was common ground that it would have anticipated claim 9 as dependent on claim 1; but not claim 9 as dependent on claims 4 to 6.

263. There is one finding of fact that I should make in case I am wrong about construction. When the seat is reclined into bed mode in BA First, about half the headrest protrudes into an area encased by the shell surrounding the seat and forward of the position where the back-rest was when the seat was in seat mode. Mr Moreno agreed that this was approximately 4” to 5”; and that 4” to 5” was of significance in terms of bed length in business class.

#### *Airbus Patent Application*

264. Airbus begins by describing BA First. The disadvantage of BA First that it described was that BA First was space-hungry; in particular because it used a primary seat and a secondary seat. This use of space was acceptable for first class, but not for other classes. Thus the object of the invention described in the Airbus patent application

was “optimum cabin utilization” for classes other than first class. The application discloses an inward facing herringbone arrangement of seats in the outboard seat columns. The seats in the central columns are forward facing. Each seat consists of a reclining seat, and extendable footrest, side privacy screen and a further privacy screen that wraps round from the front of the aisle. The seats are swivelling seats. The point of the swivel is that in take off and landing the seat is only slightly rotated so that “the inertia forces and accelerations ... are not unpleasant for the passenger”. The seat can then be rotated for the in-flight phase in order to provide adequate space for the lying function of the seat. A significant proportion of the seat, when reclined, extended into the area between the aircraft sidewall and the seat back when in seat mode; but it was less than 50 per cent.

265. In my judgment the Airbus Patent Application does not anticipate for the following reasons:
- i) The seats are swivelling seats;
  - ii) The seats are reclining seats rather than true beds;
  - iii) The reclining seat when in bed mode does not extend rearwardly behind the seat: it is the seat.

### *Boeing*

266. This discloses a seating assembly consisting of pivotable reclining seats. Its primary embodiment is for double seats. In the daytime the seats face forward; and at night they rotate through 90° or thereabouts. This means not only that two adjacent passengers have to agree when to go to sleep, but also that when the seats are rotated into the sleeping position, the aisle all but disappears. The patent portrays this as an improvement on BA First. Mr Chapman had not picked that up when he read this citation, but fairly said that he “would have grinned” if he had. It is impossible to imagine anyone in the real world taking this idea seriously, which may have a bearing when it comes to obviousness. But buried away in the specification it is possible to find a disclosure of a single reclining pivotable seat. Thus the patent explains:

“The principles, structures and methods of the present invention can also be employed with other seating units rotated to lesser angles relative to the aisle. As an example, the advantages of the present invention will be gained by a first single seat unit rotated only sufficiently to allow the leg rests of said first seat or the legs of a passenger seated in said first seat to be extended into the aisle alongside a second seat positioned forward of said first seat. Such a displacement resembles the fixed echelon position shown in [BA First]. However, the present invention offers the improvements of having additional aisle space available to aid passenger mobility during boarding, deplaning and meal service.”

267. In my judgment Boeing does not anticipate because:
- i) The seats are swivelling seats;

- ii) The seats are reclining seats rather than true beds;
- iii) The seat pan does not move forward when the seat is configured for bed mode.

*American Airlines*

268. It is not suggested that this patent application anticipates; not least because it does not disclose an inward facing herringbone.

**Obviousness**

*The law*

269. A patent will be invalid for lack of inventive step if the invention claimed in it was obvious to a person skilled in the art having regard to the state of the art at the priority date. The structured approach to determining this question is set out in the decision of the Court of Appeal in *Pozzoli v BDMO SA* [2007] FSR 37, § 23:

- “(1)(a) Identify the notional "person skilled in the art"
  - (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?”

270. In asking the question whether the differences would have been obvious, the question is whether they would have been technically obvious; not whether they would have been commercially obvious.

271. Although the structured approach is relatively easy to describe, it can be very difficult to apply. One reason for this is that at the third stage of the structured approach it is necessary to focus on the differences between the prior art and the patent in suit; but at the immediately succeeding fourth stage it is necessary to erase all knowledge of the alleged invention from the mind. That is not an easy task. Another is that where the skilled addressee is (or is a team that includes) a designer, to approach the prior art through the mind of an unimaginative designer is unreal. An unimaginative designer would soon be out of a job. Nevertheless it is the task that must be performed.

272. The structured *Pozzoli* approach is a series of steps directed to the court; not to experts. If an expert approaches his own task in the manner set out in *Pozzoli*, he will almost inevitably expose himself to a charge of having approached the final question with the aid of hindsight. That is indeed the charge that Mr Meade levelled at Mr

Chapman. To some extent that charge was made good by answers that Mr Chapman gave in cross-examination in which he accepted that he had not read the prior art with UCS out of his mind and simply asked himself what he would do with the disclosures of the prior art. Instead what he had done was to isolate the differences between the cited prior art and the patent in suit and asked himself whether there was any technical reason not to make changes to the prior art to bring it closer to the patent in suit. I say “to some extent” for two reasons. First, there must be some direction given to an expert in his reading of the prior art, otherwise he will come up with modifications that are quite irrelevant to the dispute. Second, Mr Chapman in fact began his report by setting out his initial reaction to the patent in suit (which he read before he had considered the prior art) with a view to explaining what the patent taught him that he did not already know. As he put it in his report:

“As a result my initial impression on reading the 908 Patent was that unless the invention lay in the flip-over seat design concept, I had great difficulty in understanding what may be inventive about the 908 Patent. Indeed insofar as the 908 Patent seemed to be concerned with the bed extending into the space rearward of the seat, it seems to me that Virgin were seeking to patent space – a space which all of us working in the field knew was real estate that we had to use as economically and as efficiently as possible.”

273. At least in a case in which it is alleged that the patent in suit is obvious over common general knowledge, this approach (whatever other defects it might have) is not tainted by hindsight. However, where Mr Chapman was considering whether the inventive concept was obvious over particular citations of prior art, I think that Mr Meade’s criticism has more force.

#### *Step by step*

274. It is common in obviousness attacks for the cross-examination of an expert to proceed in stages. As Lord Diplock pointed out in *Technograph Printed Circuits Ltd v Mills & Rockley (Electronics) Ltd* [1972] RPC 346:

“Once an invention has been made it is generally possible to postulate a combination of steps by which the inventor might have arrived at the invention that he claims in his specification if he started from something that was already known. But it is only because the invention has been made and has proved successful that it is possible to postulate from what starting point and by what particular combination of steps the inventor could have arrived at his invention. It may be that taken in isolation none of the steps which it is now possible to postulate, if taken in isolation, appears to call for any inventive ingenuity. It is improbable that this reconstruction *a posteriori* represents the mental process by which the inventor in fact arrived at his invention, but, even if it were, inventive ingenuity lay in perceiving that the final result which it was the object of the inventor to achieve was attainable from the particular starting



point and in his selection of the particular combination of steps which would lead to that result.”

275. Mr Vanhegan’s cross-examination of Mr Moreno on the question of obviousness followed this course. Mr Chapman followed it in his report too.

*The skilled addressee*

276. I have already identified the skilled addressee.

*The inventive concept*

277. For the purposes of discussing the question of obviousness I must assume that my construction of the patent in suit is wrong, and that the claim is not limited to true beds. It therefore encompasses reclining seats, as Virgin Atlantic argue. On that basis Mr Meade described the inventive concept in his written opening as follows:

“An inward-facing, herringbone-style seat/flat bed system in which the individual seats are in columns, forming a space between the back of the seat and the aircraft sidewall which is used to provide part of the bed area and so enable a very high density of generously-sized seats.”

278. In his written closing argument he described it as follows:

“The insight that the triangle in the space behind one seat can be used to provide extra bed length to the next seat unit along (and thereby a greater overall seat density by moving the seats out of the aisle).”

279. The latter formulation is, I think, closer to the mark, because it reflects more accurately the characterising part of claim 1 in which the bed extends rearwardly into the space behind the seat.

*Common general knowledge*

*Differences between the inventive concept and common general knowledge*

280. Contour submit that apart from the flip over aspect as depicted in the specific embodiment of the patent, the patent is simply telling the skilled person that a higher density of seat beds may be put into an aircraft cabin if the herringbone angle of the seating units is increased. This was well known to the skilled person. Furthermore when the angle is increased there is inherently a larger potential usable space behind the seat which may be used for the elongation of the bed, when the seat unit is in bed mode. As Mr Higgins put it:

“I think that when I say obviously, the minimum width of a seat that can be installed in an aeroplane either facing inboard or outboard is when it is facing inboard because you do not need access to it so the bay width between the screens is as wide as the seat. If you take those seats and face them outboard you

cannot climb over the back of the seat so it is obviously the more efficient configuration, yes.”

281. The fact remains, however, that no one had done it before Virgin Atlantic. Mr Chapman agreed that an inward facing herringbone was simply a theoretical possibility. What was preventing airlines from adopting an inward facing herringbone was the perception that passengers would not like the lesser privacy that an inward facing herringbone would give them. Not only was this the result of BA’s research; it was confirmed by research carried out by United Airlines at about the same time. However, even Mr Higgins’ evidence does not really grapple with the inventive concept; which is to allocate the triangular area behind the seat to that seat rather than to the seat behind.
282. Mr Chapman also agreed that airlines were reluctant to angle seats at greater than 18° because of a perception that premium class passengers would not like additional restraints; and he agreed that at that time no airline had used either an airbag or a three point harness. This point, however, does not go to claim 1 of the patent in suit, because it does not specify an angle.

*Were the differences obvious?*

283. It may well be that increasing the angle of installation of the seat means that inherently a larger potential usable space behind the seat. But that still does not answer the question: was it obvious to use that space for extending the bed? The fact that no airline had done it before Virgin Atlantic is not a promising start to an attack of obviousness over common general knowledge. Nor do I consider that Mr Chapman went as far as saying that it was obvious and uninventive to allocate the triangular area behind the seat in an inward facing herringbone to that seat rather than to the seat behind. The closest he came was to say that it was a question of judgment. But a judgment can be inventive. And I think that Mr Meade was right to say that in cross-examination he came close to accepting (if he did not actually accept) that it was not obvious to do that.
284. Mr Meade submitted that it is not a legitimate attack simply to cast about in the common general knowledge, using hindsight to find disparate elements which, if assembled in the way disclosed by the patent in suit, would fall within the claims. One can perfectly well have an invention in a new assembly of known elements providing a new benefit, and many good inventions are just that. I agree.
285. In my judgment the inventive concept was not obvious over common general knowledge.

*BA First*

*Differences between the inventive concept and BA First*

286. The space behind the seat in BA First was not allocated to that seat. It was used as a counter top or storage space for the seat behind. Nothing in the BA First patent taught that the space could be used for anything else.

*Were the differences obvious?*

287. In my judgment for the same reasons that the idea of allocating that space to the seat behind was not obvious over common general knowledge, it was not obvious over BA First.
288. In addition, BA First taught that an inward facing herringbone arrangement was undesirable and, moreover, proposed the use of swivel seats in an inward facing herringbone. Both these features would have been additional obstacles that the unimaginative reader would have had to have overcome.
289. In my judgment the inventive concept was not obvious over BA First.

*Airbus/Boeing*

*Differences between the inventive concept and Airbus/Boeing*

290. Airbus is only relevant to obviousness if the patent in suit loses its priority date. Nevertheless it is convenient to take it together with Boeing, because Mr Vanhegan did not suggest that there was any material difference in their teaching. Both used a swivel seat and neither had an ottoman. Both taught that the swivel seat was an improvement over BA First; and that dispensing with the ottoman saved cabin space. Airbus in particular taught that by using a swivel the pitch between seats could be made smaller, thus increasing cabin density.
291. In the case of Boeing, in the double seat configuration, the aisles all but disappear when the seats are rotated into bed mode. Mr Chapman thought that this was legal but “extreme”. In the case of the double seat arrangement privacy for passengers was non-existent. In addition in the layouts that are depicted in Boeing it would be impossible to add an ottoman.

*Were the differences obvious?*

292. To remove the swivel seat would have run directly counter to the teaching of both citations; as would the reinstatement of the ottomans. Mr Chapman said in cross-examination that there would be no reason to develop a seat that swivelled and then turn round and lock that out to make it fixed. The only reason that he gave for removing the swivelling mechanism from an existing swivelling seat was that it would be worth saving the product if the swivel mechanism proved unreliable. This evidence leads to the conclusion, in my judgment, that in the case of all the prior art citations where swivelling seats were used, it would not have been obvious to take out the swivel.
293. In the case of Boeing there is the added difficulty that the primary invention of the double swivelling seat was quite impractical as a realistic seating arrangement. Even Mr Chapman described it as “a challenge”. Even if the skilled reader found (as Mr Chapman did) an unillustrated reference in Boeing to a single swivelling seat, to have adopted it as a basis for devising a seating system would have led to a drastic reduction in passenger density.
294. In my judgment the inventive concept was not obvious over Airbus or Boeing.

## *American Airlines*

### *Differences between the inventive concept and American Airlines*

295. What is relied on here is both a patent application and also the American Airlines seat and seating system as commercialised. The AA system used a swivelling seat. When in TTOL position the seat faced forwards. When the passenger wanted to work the seat could be swivelled through 90° to face a table. When the passenger wanted to sleep the seat could be turned outward in order to co-operate with an ottoman which supported the passenger's feet. The ottoman is part of a trapezoidal space adjacent to the side wall of the aircraft, and corresponds to the area at the rear of the seat which, in the patent in suit, is used to support the passenger's head. The arrangement was an outward facing herringbone.
296. Mr Chapman considered that in order to turn this citation into the patent in suit it would be necessary:
- i) To strip out the swivel;
  - ii) To strip out the ancillary items such as the table;
  - iii) To change the outward facing herringbone to an inward facing herringbone; and
  - iv) If greater passenger density was needed, to increase the angle of installation past 18°.
297. As he accepted, it would be necessary to change everything except the seat.

### *Were the differences obvious?*

298. The swivel seat was a fundamental feature of the design of this system too. It allowed the passenger the multiple use of the space. Even to turn the arrangement into an inward facing herringbone would have been a difficult task. Mr Moreno said that it could not be done without a fundamental redesign; and Mr Chapman scarcely contradicted him. Even if a designer played with various layouts, this could hardly be described as analogous to a "workshop variation". In addition, since the proclaimed benefit of this system was the swivelling seat, there would have been no reason to remove the swivel. As Mr Moreno put it:
- "By removing the swivelling feature from the AA Patent Application you get rid of everything that the inventor says is good about that system."
299. Once again, therefore, modifications to align this citation with the patent in suit would have run counter to its teaching. In my judgment the inventive concept was not obvious over American Airlines.

### **Added matter and loss of priority**

300. If the patent in suit means what I have held that it means, then there is no issue about loss of priority or added matter. However, if it means what Virgin Atlantic say it

means, then Contour assert that the patent is not entitled to either of its claimed priority dates and should be revoked for containing added matter as compared to its parent patent application. Accordingly, in this section of this judgment I assume that my construction of the patent in suit is wrong, and that it is not limited to true beds.

### *Prosecution history*

301. The prosecution history is common ground; and I take the summary from Mr Vanhegan's written submissions.
302. The patent in suit claims priority from two priority documents: GB 0119459 (9 August 2001) and GB 0202389 (1 February 2002). Following the filing of the two priority documents Virgin Atlantic filed the Parent Patent application on 9 August 2002 as International Patent application PCT/GB02/0371 (designating amongst others an EP and a national GB patent). The Parent Patent Application was published as PCT 03/013903 on 20 February 2003.
303. Virgin Atlantic took the decision to seek to divide out of the Parent Patent Application a number of divisional patent applications. On 23 April 2004, Virgin Atlantic filed application number 04101715.3 which was published as EP 1,495,908A1 on 12 January 2005. During prosecution of this application, on 28 November 2006 Virgin limited the scope of the claims for the UK to an inward facing herringbone arrangement. The claims of the Patent for the remaining EP countries include outward as well as inward facing herringbone arrangements.

### *Legal test*

304. Section 5(2) of the Patents Act 1977 provides:

“(a) if an invention to which the application in suit relates is supported by matter disclosed in the earlier relevant application or applications, the priority date of that invention shall instead of being the date of filing the application in suit be the date of filing the relevant application in which that matter was disclosed.”

305. The question, then is whether the invention claimed in the patent in suit is “supported by matter disclosed” in the priority document. Section 5 (2) is one of the sections of the Patents Act that is intended to have the same effect as the corresponding articles of the European Patent Convention. In this context, the decision of the EPO's enlarged Board of Appeal in *G02/98 Same Invention* [2001] OJ EPO 413; [2002] EPOR 167 has been influential. The Board said:

“The requirement for claiming priority of ‘the same invention’, referred to in Article 87(1) EPC, means that priority of a previous application in respect of a claim in a European patent application in accordance with Article 88 EPC is to be acknowledged only if the skilled person can derive the subject matter of the claim directly and unambiguously, using common general knowledge, from the previous application as a whole.”

306. This was applied by the Court of Appeal in *Unilin Beheer NV v Berry Floor NV* [2005] FSR 6. In that case Jacob LJ added (§ 48):

“The approach is not formulaic: priority is a question about technical disclosure, explicit or implicit. Is there enough in the priority document to give the skilled man essentially the same information as forms the subject of the claim and enables him to work the invention in accordance with that claim?”

307. Section 72 (1) (d) of the Patents Act 1977 provides that a patent may be revoked if:

“the matter disclosed in the specification of the patent extends beyond that disclosed in the application for the patent, as filed, or, if the patent was granted on a new application filed ... as mentioned in section 15(9) above [i.e. divisional application], in the earlier application, as filed”

308. Accordingly if the patent in suit discloses matter which extends beyond that disclosed either in the patent application or in the parent patent application, it is invalid.

309. I do not understand that the test whether a patent discloses added matter differs materially according to whether the question arises in the context of priority or validity.

310. Whether the invention is disclosed by an earlier document is a question of construction and comparison. Again, the law is common ground. The classic statement of principle is that of Aldous J in *Bonzel v Intervention Ltd* [1991] R.P.C. 553, 574:

“The decision as to whether there was an extension of disclosure must be made on a comparison of the two documents read through the eyes of a skilled addressee. The task of the Court is threefold:

(a) To ascertain through the eyes of the skilled addressee what is disclosed, both explicitly and implicitly in the application.

(b) To do the same in respect of the patent as granted.

(c) To compare the two disclosures and decide whether any subject matter relevant to the invention has been added whether by deletion or addition.

The comparison is strict in the sense that subject matter will be added unless such matter is clearly and unambiguously disclosed in the application either explicitly or implicitly.”

311. Kitchen J added a number of glosses to this in *European Central Bank v Document Security Systems Inc* [2007] EWCA 600 (Pat) (subsequently approved by the Court of Appeal: [2008] EWCA Civ 192), which may be summarised as follows:

- i) The court must construe both the original application and specification to determine what they disclose. For this purpose the claims form part of the disclosure though not everything which falls within the scope of the claims is necessarily disclosed;
  - ii) The court must carry out the exercise through the eyes of the skilled addressee who will approach the documents with the benefit of the common general knowledge;
  - iii) The two disclosures must be compared to see whether any subject matter relevant to the invention has been added. This comparison is a strict one. Subject matter will be added unless it is clearly and unambiguously disclosed in the application as filed;
  - iv) Since disclosure may be implicit, the addition of a reference to that which the skilled person would take for granted does not matter;
  - v) The issue is whether subject matter relevant to the invention has been added.
  - vi) It is important to avoid hindsight. Care must be taken to consider the disclosure of the application through the eyes of a skilled person who has not seen the amended specification and consequently does not know what he is looking for. This is particularly important where the subject matter is said to be implicitly disclosed in the original specification.
312. In *European Central Bank* (§ 15) Jacob LJ added that it is not enough that the features may be obvious – they must *necessarily* be implicit.
313. In the case of a priority document there need be no claims at all. As Jacob LJ said in *Unilin* (§ 49):
- “The claims (if any – there is no rule that there should be) of the priority document are not determinative. They are just part of its disclosure. For the purposes of priority one just looks at the disclosure as a whole.
50. If the rule were otherwise one of the main functions of a priority document would be lost. Inventors and their advisors would have to start worrying not only about the technical information disclosed in the document but how it was to be claimed: have I drafted my main claim or consistory clause broadly enough? That is not the purpose of the system: the purpose at this point is to get the information justifying the later claim into a patent office of a Union country. If you do that, you can have your priority, whether you express that in a proposed claim, consistory clause, statement of invention, other text or drawing or in any combination of these.”
314. Deletion may involve added matter. Thus where an invention is said to consist of components A + B + C, a claim which claims only A + B may have added matter, because it is saying that component C is no longer necessary. Examples of this kind

of added matter are given in Terrell § 9-10. That, in essence, is Contour's allegation in the present case. They say that the priority documents and the parent patent application all claim a seating system in which a true bed is an essential component. If the patent in suit claims a system without a true bed, then it has added matter. It is, however, common ground that if the priority documents and the parent patent application disclose two discrete inventions (viz. a true bed and a seating system with or without a true bed) then Virgin Atlantic were entitled to obtain two patents, one for each invention. Mr Meade called these two inventions the "flip over seat" and the "space packing" inventions. I will do the same.

*The First Priority Document - GB Patent Application 0119459.6*

315. This document contains no claims. As it describes the invention it distinguishes between two aspects of the invention. Thus it states:

"... according to one aspect of the present invention there is provided a seating system for ... an aircraft, comprising a plurality of seats, each seat defining a longitudinal seat axis and comprising supporting structure for attaching the seat to the floor of the vehicle and seat means comprising a seat-pan and a back-rest; characterized in that said seats are arranged side by side in longitudinally off-set relation at an acute angle to the direction of travel of the vehicle, thereby defining a generally triangular or trapezoidal space to the rear of each seat; and each seat further comprises means defining a flat bed, a major proportion of which is disposed forwardly of the seat means and which extends rearwardly into said space to extend the flat bed."

316. Since the means defining the bed is disposed forwardly of the seat means, the skilled reader would understand that the means defining the bed and the seat means are not the same, otherwise the one cannot be disposed forwardly of the other. This is reinforced by the statement that the flat bed is "defined" by the further means. As Mr Vanhegan also points out, in contrast to the claims of the patent in suit the description of the invention does not disclose "means being configurable for forming" either the seat or the bed. Thus far, therefore, this priority document is describing a seating system with a true bed.

317. The document goes on to describe another aspect of the invention, in which in addition to the seat means there is a hollow extension box:

"... arranged to extend rearwardly of the seat means; and means for providing a substantially flat bed, a major proportion of which is positioned forwardly of the seat means, which extend rearwardly into the foot-box."

318. The patent in suit does not require a foot-box or extension box. This aspect of the invention cannot therefore confer priority on the patent in suit.

319. Reverting to the first aspect of the invention, the document goes on to say:



“According to the first particular aspect of the present invention, said flat bed may be disposed substantially at floor level, extending beneath the seat-pan into the extension box.”

320. This makes it clear that the seat and the flat bed are different components because the bed is “beneath” the seat-pan. The “second alternative aspect” set out in this document describes an arrangement in which the “seat means” can be:

“selectively unfolded to form a flat bed comprising an upper surface of the under-seat pan, a surface of the seat-pan and a rear surface of the backrest

Advantageously therefore different surfaces of the seat-pan and back-rest may be used in the seat mode and the bed mode respectively. Neither of the upper surfaces of the seat-pan and front surfaces of the back-rest form part of the bed means and may therefore be upholstered with materials suitable for use on a seat.”

321. It is difficult to see how this document could have stated more clearly that the seat and the bed were composed of different components. This plainly and unambiguously discloses a “flip-over” seat.
322. I agree therefore with Mr Vanhegan that this document does not directly and unambiguously disclose arrangements in which the bed shares the common surfaces of the seat-pan and back-rest. The only invention disclosed is the flip over seat.

*The Second Priority Document - GB Patent Application 0202389.3*

323. Again this document has no claims but describes the invention. According to one aspect of the invention there is provided a seating system in which the seat includes moveable components:

“wherein at least one of said moveable components is double-sided, comprising first and second opposite sides, one of said sides having a first seat surface that is adapted to form part of said seat, and the other side having second bed surface that is adapted to form part of said bed.”

324. This clearly discloses a “flip-over” bed. It goes on to reinforce that by saying that:

“The present invention is characterized in that at least one of the moveable components of the assembly has first surface that is specifically adapted for use as a seating surface, and second opposite side that is specifically adapted as sleeping surface.”

325. The document goes on to describe a second aspect of the invention in which:

“... there is provided an aircraft cabin installation comprising a plurality of passenger seat assemblies in accordance with the present invention, wherein said passenger seats are arranged in one or more rows that extend substantially parallelly to the

longitudinal axis of the aircraft cabin with each seat being arranged such that its notional longitudinal axis subtends an angle in the range 35 to 55° to the longitudinal axis of the cabin ...”

326. Although this is describing an arrangement of seating assemblies, the seating assemblies that are being described are “passenger seat assemblies *in accordance with the present invention*”. Since the only passenger seat assemblies that the document has described are those with “flip-over” seats, the skilled person would not immediately understand this as disclosing an arrangement of conventional reclining seats. Indeed to have described conventional reclining seats would not have been an invention at all. Any doubt that the reader might have felt is dispelled when the document describes the advantages of this arrangement in which it describes how, when the seat is converted into bed mode:

“... the back-rest is folded forwardly over the top of the seat-pan.”

327. In other words, the back-rest flips forward. In addition, the description of this aspect of the invention appears to me to attribute significance to the angle of installation, whereas claim 1 of the patent as granted does not.

328. The third aspect of the invention describes a seat where the back-rest component has:

“upper and lower ends comprising first and second opposite sides, one of said sides having a first surface adapted to form the back-rest of a seat and the other side having a second surface adapted to form part of a bed.”

329. I conclude that this document discloses only a seating system in which the seat is a “flip-over” seat.

330. Accordingly, if I had construed the patent in suit in the manner for which Virgin Atlantic contended, I would have held that it was not entitled to its claimed priority dates.

#### *The parent patent application*

331. Contour’s argument is that the skilled addressee, reading the parent patent application without knowledge of the patent as granted, would not understand that it disclosed, either explicitly or implicitly, arrangements in which the seats merely reclined in order to form a bed. If this is right, then the patent in suit is invalid as disclosing added matter.

332. The parent patent application describes a number of objects of the invention. These include:

- i) To provide passenger accommodation in business class “which incorporates a flat sleeping surface of maximal length”;
- ii) To provide a passenger accommodation unit which can be converted into a bed having maximal length;

- iii) “Yet another object of the present invention is to provide a passenger accommodation unit for a vehicle having a seating surface and a bed surface that may be especially adapted for use as a bed surface”;
- iv) “Yet another object of the invention is to provide a seating system for a passenger vehicle, particularly an aircraft, which optimizes the use of space within a passenger cabin”.
333. Mr Meade says that the object of the invention described in iii) above is the flip over seat, whereas the object described in iv) does not on the face of it refer only to a flip over seat, but more neutrally describes space packing.
334. The parent patent application goes on to describe “one aspect of the present invention” (pages 5-6), which clearly described the flip over seat. This is clear from the description of the seat as having a component that is “double-sided”. The application goes on to elaborate on different embodiments of this idea. Although the details of these embodiments differ, the common thread is that in none of them does the seat pan form part of the bed. Thus none of them describes a conventional reclining seat. The application goes on to say:
- “It has been found surprisingly that a plurality of passenger accommodation units according to the present invention may be arranged within a business-class section of an aircraft cabin without significantly reducing the number of seats.”
335. As in the second priority document, the passenger accommodation units are units “according to the present invention” which, thus far has not described conventional reclining seats. It continues (page 9):
- “Thus, according to another aspect of the invention, there is provided a seating system for a passenger vehicle, particularly an aircraft, comprising a plurality of seat units, each seat defining a notional longitudinal seat axis and comprising a supporting structure adapted for attaching the seat unit to a floor of the vehicle and means forming or being configurable for forming a seat comprising a seat-pan and a back-rest; characterised in that said seat units are arranged to form a column defining a notional longitudinal column axis, in which column said seat-units are arranged side-by-side in longitudinally offset relation at an acute angle to the notional column axis, thereby defining to the rear of each seat, each seat unit further comprising means forming or being configurable for forming a substantially flat bed, a major proportion of which is disposed forwardly of the position of the seat, which bed extends rearwardly into said space to extend the flat-bed.”
336. Clearly this passage, on which Mr Meade relies, found its way (with minor modifications) into paragraph [0017] of the patent in suit. Claim 44 of the application is in similar form. Contour argue, however, that although the words of this part of the application and paragraph [0017] of the patent in suit are almost identical (as are claim 44 and claim 1 of the patent in suit), the context in which this passage appears

in the application would have conveyed a different meaning to the skilled addressee. As the reader progresses on through the document the application he is told more about the invention.

337. Mr Vanhegan says that the common features of the invention are that:

- i) the seat unit is provided with self-contained means for forming a substantially flat bed (page 10 lines 29-33);
- ii) it is characterised in that the back-rest element has a first face that is specifically adapted for use as a seating surface and second opposite face that is specifically adapted for use as a sleeping surface (page 12 lines 21-27);
- iii) the seat-pan element and a first surface of the back-rest element are upholstered in a manner suitable for use as a seat whilst the second reverse surface of the back-rest element is adapted for use as a bed surface (page 17 lines 25-21);
- iv) the seating system comprises a plurality of self-contained seat units which each provide individual seating and sleeping accommodation for a passenger (page 31 lines 22-24);
- v) the seat unit comprises a seat housing and an ottoman spaced forwardly of the housing (page 31 lines 28-29);
- vi) where a plurality of passenger seat assemblies in accordance with the invention are installed in a cabin, they can be used to give the cabin two different visual appearances or ambiances according to whether a majority of the seat assemblies are disposed in a bed configuration or a seat configuration (page 60 lines 4-8);
- vii) the seat and bedding surfaces of the back-rest element of a passenger seat assembly can be given respectively different visual appearances (page 64 lines 32-33);
- viii) the seat and bedding surfaces can be respectively adapted specifically for use for their given purposes (page 65 lines 4-5);
- ix) in bed configuration the seat-pan element is completely or substantially concealed by the back-rest element (page 65 lines 10-11).

338. This is borne out by those of the figures that illustrate the seat unit. None of the illustrated seats are conventional reclining seats. All are seat units in which different surfaces are used in seat mode and bed mode respectively. Although it is true that not all of them are flip over seats, they all share the common feature that the seat surfaces and the bed surfaces are different. As Mr Vanhegan put it in his closing submissions:

“All of the passenger seat assemblies described in detail in the Parent Patent Application shared, amongst other common features, the feature of not using the surfaces which formed the seat in seat mode when forming the bed in bed mode. This is achieved either by “flipping” the back-rest of the seat so as to

use the rear side (taken in seat mode) to form the surface of the bed in bed mode, or by providing the bed entirely separately from the seat, i.e. under the position of the seat.”

339. Mr Meade also relied on a passage (page 10) which reads:

“Said seat forming means and said bed forming means may comprise one or more moveable passenger-bearing elements which are selectively configurable to form, in a seat mode, at least part of the seat for the passenger or, in a bed mode, at least part of said flat bed, and advantageously the flat bed in the bed mode is disposed at substantially the same level as the seat-pan in the seat mode.”

340. This passage clearly defines a flip over seat, where the parts of the seat are selectively configurable to form part of the bed and part of the seat. The use of the word “may”, Mr Meade said, showed that it was not necessary to have a flip over seat. It is, I think, true that a flip over seat is not necessary to the invention. The specification describes other forms of seat unit, including arrangements in which the passenger sleeps on the floor of the aircraft under the seat, but the common feature is that all of them use different surfaces in seat mode and bed mode respectively.

341. I thus accept Mr Vanhegan’s submission. Mr Vanhegan reasoned from this that the skilled addressee would therefore consider that all passenger accommodation units, seating systems and seat units described in the parent patent application were to be understood as comprising different surfaces which were used in seat mode compared to those used in bed mode. I agree with this submission too. Mr Meade’s contrary argument, in my judgment, paid far too little attention to the context in which the quoted passages on which he relied appeared. As has often been said: in law context is all. It seems to me that the highest that Virgin Atlantic’s case can be put is that it would have been obvious to a skilled addressee, on reading the parent patent application, that the benefits of the described seating systems could have been transposed to a seating system in which the seats were conventional reclining seats. But obviousness is not the same as disclosure.

342. Accordingly, if I had construed the patent in suit in the manner for which Virgin Atlantic contended, I would have held that it was invalid for added matter.

## **Result**

343. Virgin Atlantic have failed to prove that Contour copied its designs, and consequently the claim for infringement of unregistered design right fails.

344. The patent in suit is valid but not infringed.