Intellectual Property Office

BL O/001/15

2 January 2015

PATENTS ACT 1977

BETWEEN

Airscience Technology International Limited	Claimant
and	
Wallenius Water AB	Defendant

PROCEEDINGS

Application for revocation under section 72 of the Patents Act 1977 of patent number EP(UK) 0800407B1

HEARING OFFICER A C Howard

Hearing date: 31 October 2014

Mr Brian Dewsbery represented the claimant
Mr Paul Howard of Carpmaels and Ransford represented the defendant

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DECISION

Introduction

1 This decision concerns proceedings under the Patents Act 1977 ("The Act") for revocation of European patent EP (UK) 0800407 ("the patent") in the name of Wallenius Water AB ("Wallenius").

2 The patent relates to the treatment of contaminants in fluids, such as air and water, with UV light, ozone and free radicals (products of ozone decomposition). Certain claims relate to the treatment of a fluid (i.e. both water and air) while others relate only to the treatment of water. The claims relating solely to the treatment of water have not been challenged.

3 Wallenius is a Swedish company (formerly Benrad Aktiebolag). The claim is bought by Airscience Technology International Limited ("Airscience"), of which the managing director is Mr Brian Dewsbery. Mr Dewsbery appeared before me at the hearing without the benefit of professional representation.

4 The patent has been the subject of proceedings in the High Court brought by Benrad and Biozone International against a company called Airsteril UK who were ordered to

cease activities which were held to infringe the patent and deliver up any infringing items. Mr Dewsbery was the managing director of Airsteril UK.

5 The present proceedings to date have been protracted and have already been the subject of a decision, two further preliminary decisions and a case management conference/preliminary hearing in April 2014.

6 Airscience originally filed a claim for revocation on 6 March 2011. However, it was decided[1] that revocation proceedings could not proceed in the IPO as concurrent proceedings in the High Court on the same patent had not concluded.

7 Airscience then filed a new claim on the 6th September 2012 which started the present proceedings. However, Wallenius argued that Airscience was estopped from bringing revocation proceedings in the IPO as the issue had already been heard and decided on in the High Court. In a preliminary decision[2] I ruled that the proceedings could go ahead.

8 Wallenius then made an unconditional offer to amend the claims of the patent by way of limitation, and the parties were subsequently allowed to amend their respective statements.

9 Airscience's amended statement seeks revocation of the patent on the grounds that

> (i) even as proposed to be amended it lacks novelty and an inventive step on the basis of the following prior art documents:
>
> > US 4990311 (HIRAI Y; ITO, T) published Feb 5 1991 (US '311 or "ITO")
> >
> > US 5015442 ((HIRAI Y) published May 14 1991 (US '442)
> >
> > US 5302356 (SHADMAN, FF; Governal RA) published April 12 1994 (US '356)
> >
> > US 5288461 (Gray B D) published Feb 22 1994 (US '461)
> >
> > US 5186907 (Yanagi M et.al.) published Feb 16 1993 (US '907)
>
> (ii) that it does not disclose the invention clearly enough and completely enough for it to be performed by a person skilled in the art,
>
> (iii) that it contains added matter and
>
> (iv) that the protection conferred by the patent has been extended by amendment which should not have been allowed.

10 An amended counterstatement was filed on 6th February 2014. This questioned whether the amended statement of grounds had clearly set out the grounds for invalidity. Wallenius argued that Airscience had not adopted the approach laid out in

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[1] BLO/326/11
[2] BLO/156/13

the authorities in relation to lack of inventive step, namely *Windsurfing*[3] as modified by *Pozzoli*[4]. The counterstatement also requested that if some of the claims were found invalid that Wallenius be allowed to amend to the patent to remove those claims.

11 Airscience filed its evidence in chief on 20 February 2014. This comprised an amended version of an earlier statement of Mr Dewsbery which had been provided with the statement of claim. This reiterated points made in relation to the five prior art documents.

12 Wallenius provided its evidence in chief on 6th March 2014. This comprised an amended version of an earlier witness statement provided by Professor Torbjorn Reitberger. Airscience filed its evidence in reply on the 22nd April 2014. This comprised a new report from an expert, Mr Gordon Morris.

13 Wallenius then requested that Airscience's evidence in reply be struck out on the grounds that it was not evidence strictly in reply and that it was filed out of time. In particular, Wallenius submitted that Airscience's evidence in chief was mere argument, not evidence. Airscience also challenged Wallenius's evidence. As a result of this procedural dispute a preliminary hearing and case management conference was held on 28th April 2014 which considered the following questions:

- Admissibility of Airscience's amended statement of grounds
- Admissibility of the allegation that the amended claims extended the scope of protection
- Admissibility of Mr Brian Dewsbery's witness statement of 20th February 2014
- Admissibility of Mr Gordon Morris's expert report of 22nd April 2014

14 In a decision dated dated 19 August 2014[5], the hearing officer ruled that:

- Airscience's amended statement of grounds filed on 23rd January 2014 and the witness statement of Mr Brian Dewsbery dated 20th February 2014 were both admissible.
- Airscience's request for an extension of time to file its evidence in reply was alllowable. However, he found that the report of Mr Morris filed on 22nd April 2014 was inadmissible in that it was not evidence in reply and ordered it to be struck out.
- Airscience was allowed to file an amended version of Mr Morris's report that better met the requirement of evidence in reply.

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[3] *Windsurfing International Inc. v Tabur Marine (Great Britain) Ltd*, [1985] RPC 59

[4] *Pozzoli SPA v BDMO SA* [2007] EWCA Civ 588

[5] BL O/370/14

15 Amended evidence was subsequently filed by Airscience and Wallenius has maintained its objection that at least some of this material is not strictly in reply. I shall deal with that point later.

16 The matter finally came before me for a substantive hearing on 31 October 2014. As I have remarked, Mr Dewsbery represented Airscience. He is not a lawyer and is unfamiliar with litigation proceedings. Mr Howard pointed out that Mr Dewsbery had previously had professional assistance for the majority of this action and submitted that he should not be excused any procedural irregularities. My approach in this regard is to use the flexibility inherent in Rule 74 of the Patents Rules 2007 to make allowance for Mr Dewsbery's lack of experience whilst respecting the overriding objective in the same Rule that the case must be dealt with justly.

The Law

17 Section 72(1) of the Act sets out the criteria for revocation of a patent. The relevant parts read:

> *Subject to the following provisions of this Act, the court or the comptroller may by order revoke a patent for an invention on the application of any person (including the proprietor of the patent) on (but only on) any of the following grounds, that is to say -*
>
> *(a) the invention is not a patentable invention;*
>
> *(b)....*
>
> *(c) the specification of the patent does not disclose the invention clearly enough and completely enough for it to be performed by a person skilled in the art;*
>
> *(d) the matter disclosed in the specification of the patent extends beyond that disclosed in the application for the patent, as filed;*
>
> *(e) the protection conferred by the patent has been extended by an amendment which should not have been allowed.*

18 Airscience's submissions under section 72(1)(a) were made on the grounds that the invention lacked novelty and an inventive step. Novelty is addressed, in sections 1(1)(a), 2(1), 2(2) and 2(3), and inventive step in section 1(1)(b) and section 3, of the Act. These read as follows:

> *Section 1(1)*
> *A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say -*
> *(a) the invention is new;*
> *(b) it involves an inventive step;*
> *(c).....*
> *(d).....*
> *and references in this Act to a patentable invention shall be construed accordingly.*

Section 2(1)
An invention shall be taken to be new if it does not form part of the state of the art.

Section 2(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.

Section 2(3)
The state of the art in the case of an invention to which an application for a patent or a patent relates shall be taken also to comprise matter contained in an application for another patent which was published on or after the priority date of that invention, if the following conditions are satisfied, that is to say -
(a) that matter was contained in the application for that other patent both as filed and as published; and
(b) the priority date of that matter is earlier than that of the invention.

Section 3
An invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art, having regard to any matter which forms part of the state of the art by virtue only of section 2(2) above (and disregarding section 2(3) above).

19 Section 75 provides for the opportunity to amend a patent during revocation proceedings. The relevant parts read:

(1) In any proceedings before the court or the comptroller in which the validity of a patent may be put in issue the court or, as the case may be, the comptroller may, subject to section 76 below, allow the proprietor of the patent to amend the specification of the patent in such manner, and subject to such terms as to advertising the proposed amendment and as to costs, expenses or otherwise, as the court or comptroller thinks fit.

(2) A person may give notice to the court or the comptroller of his opposition to an amendment proposed by the proprietor of the patent under this section, and if he does so the court or the comptroller shall notify the proprietor and consider the opposition in deciding whether the amendment or any amendment should be allowed.

20 The relevant part of section 76 is subsection (3) which reads as follows:

(3) No amendment of the specification of a patent shall be allowed under section 27(1), 73 or 75 if it -

(a) results in the specification disclosing additional matter, or

(b) extends the protection conferred by the patent.

21 Section 125 (1) describes how the extent of protection provided by a patent should be determined. It reads:

> *For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.*

22 I shall first address the points raised in relation to the evidence and then go on to discuss Airscience's substantive claims.

The evidence

Mr Morris – Airscience's expert

23 Airscience's expert witness is Mr Gordon A Morris. In his written statement he declares that he has no present or past involvement with either party and considers he has no conflict of interest. His CV states he has B.Sc. (Hons) in mechanical engineering from Heriott Watt University (1975). He lists membership of many professional bodies including a fellowship of the Institute of Mechanical Engineers (1993) and membership of the American Society of Heating, Refrigeration and Air-conditioning (1999). Since 1979 he has been running his own consultancy service. He cites many areas of activity, those most relevant to the present proceedings being in the design and specification of close control environmental systems, project management and building services design integration. He says in the field of building services he has "*experience in the design and specification of ventilation and air conditioning systems which utilise sterilisation equipment in food processing factories, catering establishments and health care facilities"*. Mr Howard cross-examined Mr Morris on his experience and knowledge of engineering and of ozone chemistry. For example, Mr Morris said he had been involved in ozone sterilisation in his engineering practice. From his cross-examination I gained the impression that Mr Morris's experience of ozone and UV lamps was more focussed on engineering aspects, for example in ventilation systems, rather than on the chemistry of ozone itself. I found Mr Morris to be open and credible when giving his opinions as an expert witness.

Prof Reitberger – Wallenius's expert

24 Wallenius's expert witness is Professor Torbjorn Reitberger from Stockholm, Sweden. Prof Reitberger states he was a professor of nuclear chemistry, now applied chemistry, at the Royal Institute of Technology (KTH), Stockholm. He states he has specialist knowledge in fields including radiation and radical chemistry, photo-catalysis and advanced oxidation processes and says he has devoted some of his career to the "notoriously difficult chemistry of ozone". He says he has published over 100 scientific articles in international journals, book chapters and conference

reports. He lists ten articles from 2004 to 2013. The titles of seven of these mention radical or oxidant chemistry.

25 In their letter of 25 April 2014, Airscience's then representative Scott & York referred to Prof Reitberger as a "highly qualified expert" but did complain about his alleged allegiance with Wallenius. In a letter to the IPO on 13 October 2014 Prof Reitberger admitted that *inter alia* he had acted as a senior research advisor for Wallenius Water since 2008. It would have been preferable for Prof. Reitberger to have mentioned this in his written statement, but this kind of relationship does not in general bar a person from acting as an expert witness provided they have not been involved in assisting the respective party in the preparation of their case or acting in some other way as an advocate for their client. I have no reason to believe this is the case here and am therefore happy to admit Prof. Reitberger's expert evidence.

26 I should mention here the fact that Airscience did not exercise its right to cross-examine Prof. Reitberger. The normal rule is that if a witness is not cross-examined, then their evidence is to be taken as unchallenged. However the role of an expert witness is to assist a court or tribunal, which in revocation actions usually means to help understand the science and/or technology involved as well as ascertain the perspective of the skilled person and the common general knowledge. As such, expert evidence is in the nature of opinion. I do not therefore consider myself bound to accept everything Prof. Reitberger says, particularly in relation to what might or might not be obvious, despite the fact that he has not been cross-examined. It is for me, as the hearing officer, to consider the technical facts and issues and then to draw my own conclusions about the questions before me.

Admissibility of Mr Morris's evidence

27 As I have remarked, the original version of Mr Morris's evidence (22 April 2014) was found to be inadmissible and Airscience was allowed the opportunity to resubmit it.

28 Mr Howard submitted that I should also strike out the current version of Morris's evidence. In particular, he argued that Mr Morris's evidence is still not strictly in reply with reference to three authorities.

29 First, Mr Howard referred me to *Natas's* application[6] which he said establishes that the evidence in strict reply must be to meet any criticism of its evidence. In that judgment Lloyd-Jacob J said in relation to the claimant's evidence:

> "*Having put forward the construction shown in the drawing.....they are in truth not meeting the applicant's criticism of it by diverting attention to a different construction. The rules here being considered are directed to securing finality of the prehearing procedure*"

30 Mr Howard also referred me to *Scragg*'[7] and *Peckitt* [8], which show that evidence in strict reply should not make or strengthen a party's case nor justify a further round of evidence from the defendant. In *Scragg*, Graham J made the following point:

[6] Ford Motor Company (Nastas's) Application [1968] FSR 213

"If an opponent has a case he should straightaway state what his case is and should put in declarations dealing with any evidence which he thinks may be relevant to that case"

31 In relation to this question Mr Howard said "*The evidence in chief was a statement by Mr. Dewsbery, who conceded in the written proceedings that it did not contain any expert evidence. Therefore, the evidence in reply cannot be meeting criticisms of the evidence in chief because there was none*". While I can see the logic in this argument, I do not accept that the authorities lead to the conclusion that where a claimant files no or defective expert evidence in chief, there is no possibility of filing expert evidence as part of the evidence in reply provided the principles set out in the authorities are respected.

32 Mr Morris's amended statement follows the structure of Prof. Reitberger's evidence and I am accordingly inclined to admit the former to the extent that it addresses only the points in the latter. In this regard, Mr Howard identified three specific points in Mr Morris's evidence which he said were new:

(i) That the use of UV light to disinfect airstreams dates back to 1900 (Mr Howard submits this is an assertion of common general knowledge which has not been mentioned before)

(ii) That free radicals will not be produced in the absence of water;

(iii) That it is extremely unlikely that any ozone generated by a lamp producing 253.7nm and 185nm would survive the passage of the lamp.

33 Regarding point (i), Mr Morris's evidence says at paragraph 3.3.5 "*The use of UV light to disinfect room air streams dates back to around 1900*". The relevant passage in Prof Reitberger's evidence reads ""*the formation of ozone from oxygen exposed to UV light at 140-190nm was first reported by Lenard in 1900 and fully assessed by Goldstein in 1903*". Thus, while Prof Reitberger referred to some principles of ozone chemistry that date back to the 1900s he does not mention the use of UV to disinfect airstreams in 1903. I therefore consider that (i) is a new point and will disregard this piece of Mr Morris's evidence.

34 Taking point (ii), Mr Morris says at paragraph 3.8.1 of his evidence that "*In air it is atomic oxygen that is produced by the decomposition of O_3 with any water vapour present generating small quantities of free radicals. In the absence of water, free radicals will not be produced".*

35 The passage in the Prof Reitberger's evidence to which Mr Morris refers (paragraph 50) reads "*Ozone is used in the apparatus as the vehicle for radical generation. For this reason, ozone is generated in the fluid, e.g. by a UV lamp that emits radiation at 185nm. The patent teaches that the molecular ozone generated may react with some contaminants in the fluid..... More favourably, free radicals formed by decomposing ozone are taught to be non-selective and to oxidise all classes of contaminants. No emphasis is given to producing a gas mixture including ozone. In*

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[7] Scragg (Earnest) Ltd's Application [1972] RPC 679

[8] Peckitt's Application [1999] RPC 337

contrast, the patent is focussed on maximising the amount of free radicals in the fluid". Prof Reitberger's comments here do not seem to be a criticism, even an indirect one, of Airscience's evidence-in-chief.

36 In my view, Mr Morris's evidence here is not in strict reply. Rather it is the type of evidence which *Nastas* and *Scragg* indicate should have been submitted earlier in Airscience's evidence in chief. I will therefore disregard this passage of Mr Morris's evidence.

37 While Mr Howard raised point (iii) in his skeleton argument he did not press it at the hearing. This concerns Mr Morris's comments on Prof Reitberger's commentary on ozone synthesis and decomposition by the two different wavelengths of UV. Prof Reitberger's evidence (paragraph 15) says "*Thus, efficient destruction of ozone occurs simultaneously with its generation*".

38 The passage of Mr Morris's evidence (paragraph 3.3.8) to which Mr Howard objects reads "*A lamp producing light at wavelengths of both 253.7nm and 185nm would be expected to simultaneously produce and decompose O_3.....This means that it is extremely unlikely that any O_3 produced by the lamp, would survive its passage past the lamp*". It seems to me that this is directed to Professor Reitberger's evidence and I shall allow it to be admitted.

39 Shortly before the hearing, on 27 Oct 2014, Airscience filed some further material in relation to Prof Reitberger's background. Mr Howard objected strongly to this late-filed evidence saying that I should not accept it. I agree and will not admit this evidence.

40 Thus, apart from the evidence which I have discussed above and refused to admit I will accept Mr Morris's evidence in strict reply filed on 16 September.

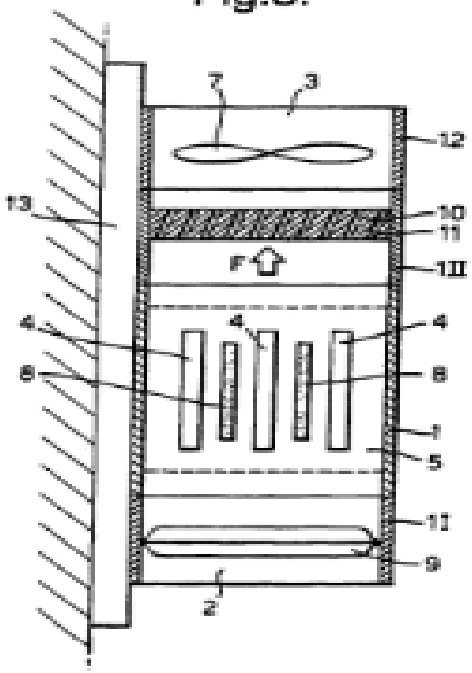
41 I shall now proceed to address the substantive questions before me.

The patent

42 As I have mentioned, the patent relates to the treatment of fluids (notably air and water) to remove decontaminants using irradiation with ultraviolet light and a catalyst.

43 The specification contains five figures. Below is a representation of Figure 3

Fig.3.



44 As shown in the drawings reference numeral 4 denotes the UV lamp and ref 8 denotes the catalyst. Fluid is drawn through the apparatus inlet (ref. 2) by the fan (ref. 7). Treated fluid exits at ref. 3. Figs 1, 2, 4 and 5 show the same configuration of the catalyst and lamps. Fig 4 does not distinguish lamps and catalysts. No other configuration of the lamps and catalyst are shown in the specification.

45 Wallenius has submitted amendments to claim 1 and 7 under section 75. While the offer to amend is unconditional, the acceptance of the amendments is a matter for the exercise of discretion. It will therefore be most convenient if I first consider the validity of the notionally amended claims. Only if I find some reason why they should not be allowed will it be necessary to consider the validity of the un-amended claims. On the other hand, if the amended claims are allowable and free of any objection, I will permit the patent to stand as amended.

46 The main claims are set out below with the additional words that Wallenius seeks to insert shown in bold:

1. Method for treatment of fluids, comprising the steps of generating ozone in the fluid, exposing the ozone to UV radiation at the same time as it is being generated with at least one UV generating member, arranged in the fluid, thereby breaking down the ozone and obtaining free radicals to destroy contaminants, characterized in exposing the fluid to at least one catalyst ***arranged adjacent said UV generating member relative to the direction of flow****, at the same time as the ozone is broken down for increasing the amount of free radicals.*

7. Apparatus for treatment of fluids, which comprises an enclosure (1) provided with at least one inlet (2), at least one outlet (3), at least one UV generating member (4) arranged in the enclosure (1) capable of generating ozone and at the same time

breaking down the ozone to free radicals, characterized in that it is provided with at least one catalyst (8) for increasing the amount of free radicals, which at least one catalyst is arranged adjacent said UV generating member ***relative to the direction of flow****.*

Construction of the proposed amendment

47 It will become clear that central to these proceedings is the proper construction of the phrase "*'adjacent...relative to the direction of flow'* which Wallenius has asked to be allowed to add to claims 1 and 7. This is relevant both to the question of whether the amendments have a basis in the specification and/or extend the scope of protection; and also whether the claims as amended are novel and possess an inventive step in relation to the cited prior art.

48 At first glance, the phrase '*adjacent....relative to the direction of flow*" can be interpreted in a number of ways. However, the authorities make it clear that I must construe the claim through the eyes of person skilled in this art who has "*the intention of understanding it in the sense which will make it workable*"[9]. I am particularly guided by principles of construction which were set out by Jacob J in *Technip*[10] and summarised by Pumfrey J in *Halliburton*[11] at paragraph 68*.* Particularly relevant is the principle in Halliburton which reads that "*it follows that if the patentee has included what is obviously a deliberate limitation of his claims, it must have some meaning. One cannot disregard obviously intentional elements*".

49 Mr Howard pointed out that the amended claims were advertised and no oppositions were filed. While this may be the case I do not find it is particularly persuasive. The most that can be concluded from this is that no-one else is interested in the outcome of these proceedings.

50 Airscience's arguments which I regard as relevant to the question of construction are interwoven with their arguments on added matter. I think it is appropriate for me to deal with the issue of construction first and then address the question of added matter once I have construed the claim.

51 Airscience say in their statement (paragraphs 6 and 8) "*the feature which claim 1 has been amended to include, had not been explicitly disclosed therein*"; and *"there is no explicit basis in EP0800407 as filed for the catalyst to be arranged 'adjacent' to the UV generating member 'relative to the direction of flow*'".

52 At the hearing, Mr Dewsbery put it to me that he had "*checked in the Oxford Dictionary and 'adjacent', for example, said, 'next to' or 'adjoining', so it is very difficult to judge what that actually means. 'Relative' I also looked up and it said, 'In relation or in proportion to something else'. So in terms of describing locations and situations I think both those terms are relatively ambiguous"*. He went on to say "*one interpretation could be that the catalyst is located after the UV generating member in the direction of flow while still being adjacent to the UV generating member*".

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[9] Raleigh Cycle Co Ltd. and another v H Miller & Co. Ltd [1948] ER 308 at 317
[10] Technip France SA's patent [2004] RPC 46
[11] Halliburton Energy Services Inc v Smith International (North Sea) [2005] EWHC 1623 Pat

53 In relation to this point Mr Howard said "*One meaning that has been ascribed to it is that the catalyst is adjacent but downstream of the UV generating member*". He went on to say this "*would be inconsistent with the description of the drawings, contrary to section 125(1)*". He also said that one would interpret the arrangement of catalyst and UV member in line with his submissions because "*In addition locating the catalyst in the area which the UV member irradiates is already inherently in the claims because ozone is decomposed by UV and the catalyst at the same time*".

54 Mr Howard also made the point neither of the expert witnesses had suggested that the claims should be interpreted in a different way, although I would observe that Mr Morris was not specifically asked how he would interpret the claim.

55 It is clear to me that the word "adjacent" itself, when applied to the relationship between two objects, is not limited to any particular configuration beyond them being next to each other and/or touching. For example, two trains in a station may stand at adjacent platforms, while adjacent carriages in a single train are normally understood as being coupled to one another. However I am obliged to construe the expression "relative to the direction of flow" as having some meaning. In this context I favour Mr Howard's view.

56 Moreover, the aim of the invention, which the application plainly teaches, is that the catalyst and UV generating member function at the same time. During the course of the hearing Mr Dewsbery indicated that the passage of air through the type of apparatus in this field could be viewed from the perspective of a discrete pocket of air. For example he said "*Whilst it is clear that if one were to follow a discrete pocket of gas mixture through the apparatus of ITO that the steps themselves are sequential".* Indeed, the concept of a pocket of air flowing through the apparatus has been referred to several times in these proceedings. I think this is a helpful way of looking at it.

57 From this perspective, in order to be consistent with the claims, the catalyst and lamp must be able to function in the same area rather than sequentially. Therefore, I believe, in the light of the teaching of the patent, that the skilled addressee would interpret "adjacent" in connection with "relative to the direction of flow" to mean that the components are arranged across the direction of flow, rather than upstream and downstream.

58 While the phrase in question could be clearer I do think that it is sufficiently clear when considered in the context of the description as a whole.

Allowability of the amendments

59 I shall consider Airscience's arguments in turn.

Clarity

60 While lack of clarity is not a ground for revocation, it can be raised as an objection to a proposed amendment, since it would not be right for the comptroller to exercise discretion to allow a claim to be amended in such a way as to render it unclear.

61 Airscience's statement (paragraph 12) says "*the term 'relative to the direction of flow' is not clear and is not limiting*. *There is nothing in claim 1 as amended, or the description as filed, to indicate what 'relevant to the direction of flow' might be interpreted to mean....the term 'relative' gives no further information about how the catalyst and UV generating member might be positioned with respect to the direction of flow*".

62 I have construed the phrase "adjacent relative to the direction of flow", above and, while I can appreciate the point made by Airscience, for the reasons already given, I believe that in the present context these words are clear and limiting in their effect. No objection therefore arises under this heading.

Added matter and support

63 Mr Dewsbery argued that "*the only basis for such an interpretation* [that the catalyst and UV generating member are side by side, and not one after the other] *would be in the specific embodiment described, and without including all the other features of the specific embodiments, as illustrated in the figures and described in the text. There would be an intermediate generalisation which would add matter to the application as filed*". In Airscience's statement (paragraph 11), this line of argument is developed more fully saying that "*by relying on upon the disclosure of a particular embodiment for basis, without including all the features of that particular embodiment, that an intermediate generalisation had been made.....In particular we would refer the parties to T0191/93*[12] *in which amendments were based exclusively on the drawings, and only introduced some of the features of the drawings, and in which added matter was found*".

64 Mr Howard acknowledged that the application as filed does not contain a verbatim basis for the amendments, but went on to say that "*the law does not require an amendment to have a verbatim basis.*" He submitted that "*the drawings fully support the amendment, but the defendant is not relying solely on the drawings and therefore has not created an intermediate generalisation*". Moreover, he submitted that there is no bar to an intermediate generalisation if the amendment complies with the test in *Bonzel*[13]. Here, to quote Aldous J in relation to assessing added matter:

> "*The task of the court is threefold*:
>
> *(1) To ascertain through the eyes of the skilled addressee what is disclosed, both explicitly and implicitly in the application.*
>
> *(2) To do the same in respect of the patent as granted.*
>
> *(3) 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".*

[12] T0191/93, Hitachi Ltd. 1994 Decision of the Boards of Appeal, European Patent Office

[13] *Bonzel and Schneider (Europe) AG v Intervention Ltd* [1991] RPC 553

65 Mr Howard also referred me to *Edwards v Acme Signs*[14], pointing out that in that case the Court of Appeal allowed an intermediate form of a claim, albeit that it was not referred to in those terms. Having considered these authorities I agree that there is no bar *per se* to making an intermediate generalisation in a claim, but what is important is the comparison of the respective disclosures.

66 The EPO Technical Board decision T0191/93 cited by Airscience concerns a semiconductor pressure transducer in which two features in the drawings which contained over 50 components were incorporated in the claims. In that decision the Board said *"Indeed the introduced particular features (h1) and (h2) are selected among other features of the original drawings; however, this selection is arbitrary in the sense that it is not derivable from the original application that (h1) and (h2) can be isolated from said other features shown in the drawings*". The Board held the amended claims not admissible because this selection was arbitrary and also a certain phrase *"much nearer*" in describing the relationships of parts was not clear.

67 In relation to the matter before me, I would refer to Mr Howard's submissions where he said that "*the catalysts are placed in area 5, which is stated at column 5, line 55 to be in the area around the lamps*. *The drawings also clearly show that the term means side by side in the flow, not upstream/downstream*". I have already concluded that this is the proper construction of this phrase.

68 Mr Howard also pointed out that the patent contains the phrase "*relative to the direction of flow*" in column 7, line 21, albeit I note this is in relation to the filter.

69 In contrast to the situation in T0191/93 I do not see that Wallenius is arbitrarily selecting features in their proposed amendments but is characterising a relationship between features which is the only configuration described and is clearly of central importance to the invention. I therefore do not consider that the amendments comprise an unallowable arbitrary selection of features.

70 Airscience also referred in their written submissions (paragraph 11) to another EPO Technical Board decision T0906/07[15], saying in that case "*the only indication of a position of a door was found in the figures, and that there was no suggestion in the description that the schematic representation was actually meant to correspond to a technical feature of the apparatus shown in the figures*".

71 T0906/07 concerned electrophotographic printing on paper where it was held that deletion of a feature in the claim could not later be remedied by relying on generic features. The Board's decision said "*the parent application as filed in the Board's view also fails to unambiguously disclose the further limitation that the door includes the portion of the top from the front to the said opening.....There is no hint whatsoever in the description itself that this detail of the schematic representation was actually meant to correspond to a technical feature of the apparatus shown in the figures*".

[14] A C Edwards Ltd. v Acme Signs & Displays Ltd. [1992] RPC 7
[15] T0906/97 Seiko Epson Corp. 1999 Decision of the Boards of Appeal, European Patent Office

72 I do not find T0906/07 particularly instructive, as the critical feature of Wallenius's patent, namely that catalyst lies in the area of the UV lamps, is mentioned in the description whereas in T0906/07 there was "*no hint*" in description of the limitation referred to in the claims.

73 For the above reasons, I am of the view that the proposed amendments do not add matter and are supported by the specification as filed.

74 Next, I turn to question of whether the amendments extend the scope of protection of the patent. This point was made by Mr Dewsbury in his address to me but he did not develop it further, nor is there much more than a simple assertion in Airscience's statement. Mr Howard submitted "*In essence, the amendment places a limitation on the claim and there can, therefore, be no extension of subject matter*". I agree. On the construction I have placed on the words in question, they are clearly a limitation to the main claims and cannot therefore extend the scope of protection.

Sufficiency

75 Airscience also argued that the amendments to the claims render the patent insufficient. Their arguments rest on two grounds. Firstly, on account of their view that the term "*relative to the direction of flow"* is ambiguous. As I have already decided that this term is clear, this line of attack falls away.

76 Secondly, Airscience say in their statement (paragraph 28) "*If....the description of the subject matter set out in paragraphs 4 to 6 of the counterstatement is meant to indicate that the reactions in the discrete pockets of gas mixture are simultaneous, then it would appear that the disclosure of E0800407 is insufficient as the apparatus of EP0800407 does not differ from that of ITO. There is no disclosure in EP0800407 as to how such simultaneous activity occurs and how the gas mixture would react differently to that discussed in ITO, given the identicality of the apparatus".*

77 Mr Howard accepted that from the perspective of an individual molecule of ozone it is impossible to simultaneously generate it and break it down. He submitted, however, that the skilled person would interpret "*the claim in a logical manner that makes technical sense*".

78 The reference to the distinction with one of the cited prior art patents is a somewhat different issue and is dealt with below. As far as sufficiency is concerned I take Airscience's point to be that as what is claimed is arguably impossible, the skilled addressee would not, on the basis of the teaching in the description, be able to perform the invention as claimed, contrary to section 14(3) of the Act. However, it is clear to me that the expression "at the same time" (I note that the claim does not actually use the term "simultaneous") means that within a given pocket of air, reactions involving both generation and decomposition of ozone are happening at any given moment. This is a perfectly reasonable scenario and I believe that the skilled addressee would have no problem understanding what is being required by the claim language and carrying it out on the basis of the description. The argument that the proposed amendments render the patent insufficient therefore fails.

79 In summary, I consider that the proposed amendments are clear and sufficient, and do not add matter or extend the scope of protection of the patent.

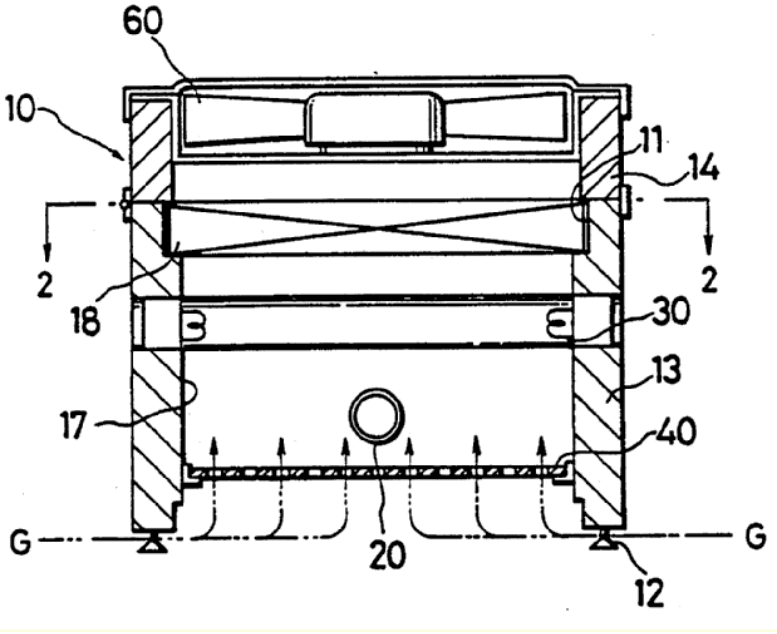
80 I will now go on to consider whether the amended claims are novel and inventive in view of the prior art. In this regard, Airscience has raised questions of the proper construction of certain elements of the claims. I have discussed the phrase "adjacent....relative to the direction of flow" comprehensively above. Another contentious element is the expression "exposing the fluid to at least one catalyst [...], *at the same time* as the ozone is broken down for increasing the amount of free radicals". This I have construed above (in the context of discussing sufficiency) as referring to reactions occurring in a discrete pocket of air in the apparatus.

Novelty

81 US '311 and US '442 are cited under this heading.

US '311

82 Fig 1 of US '311 is as follows:



83 The drawing shows a catalyst layer (ref. 18) situated downstream of an ozone-generating lamp (ref. 20), the arrows indicating the direction of flow. The ozone-decomposing lamp (ref. 30) is arranged next to the catalyst to irradiate the region of the catalyst.

84 Mr Dewsbery submitted that US '311 "*discloses a method for deodorising a gas mixture which includes using a UV lamp to generate UV radiation at 185 nanometers to produce ozone from oxygen in the air and at the same time using a lamp to generate UV radiation at 254 nanometers to decompose the ozone as it is being produced into nascent oxygen, i.e. free radicals, for decomposition of a malodorous substance in the gas mixture, for example, in column 2, line 3 to column 3, line 49; column 7, line 20 to line 51; claims 1 and 2 and figures 1 and 2".*

85 He emphasised that this *"increases the amount of nascent oxygen, i.e. free radicals, as the catalyst acts to decompose the ozone in combination with the 254 nanometer UV radiation*". He followed this by saying "*relative to the direction of flow" has no clear meaning. One interpretation could be that the catalyst is located after the UV generating member in the direction of flow whilst still being adjacent to the UV generating member. Referring to figure 2 of ITO, for example, the catalyst 18 is located after, but still adjacent to the UV generating member 30 in the direction of flow*".

86 Wallenius's statement (paragraph 50) highlights a passage in US '311 in the description (column 3 lines 25-30) which reads "*Ozone is produced by the ozone-generating ultraviolet lamp.....Thereafter, the ozone...is decomposed by the catalyst layer and the ozone-decomposing lamp*".

87 In my view, the catalyst and UV generating member in US '311 are not adjacent relative to the direction of flow as I have construed it in the amended clams. This is sufficient to render amended claims 1 and 7 novel over US '311. However for completeness, I should also address the point made in Airscience's statement and other materials filed, that the lamps and the catalyst in US '311 act at "the same time" as required by the amended claims of the patent. This was the subject of submissions by both parties and is addressed in the expert evidence.

88 Mr Howard submitted that UV lamps do not behave like light bulbs. Both experts agreed that UV photons at 185nm do not travel more than a few centimetres in air. Mr Howard submitted there is a gap between the two lamps and suggested that this is more than a few centimetres. I note however that the document in question does not specify any dimensions.

89 Airscience's statement says (paragraph 26) that U*S '311 "clearly discloses a single chamber (17) in which the volume of gas mixture therein is simultaneously exposed to UV....and exposed to an ozone decomposing catalyst support layer (11), although in which discrete pockets of gas mixture are sequentially acted upon..*"

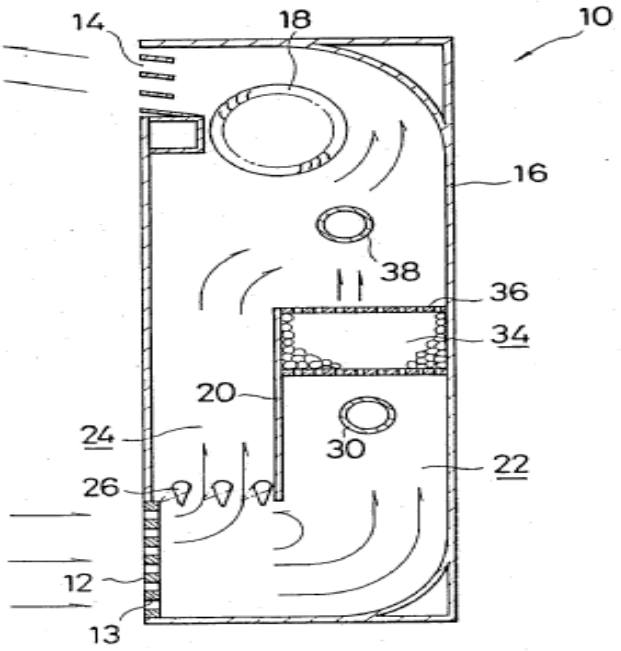
90 Under cross-examination Mr Morris said that he stood by the statement in his evidence that US '311 "*clearly separates the functions of ozone generation at the first UV source and the destruction at the second UV source and catalyst*".

91 I therefore conclude that when viewed from the perspective of a discrete pocket of air, which, as I have already concluded, is the way the ordinary addressee would understand the claims of the patent, the reaction with the lamps and catalyst in US '311 is sequential, not "at the same time" as required by amended claims 1 and 7.

92 For these reasons I conclude that US '311 does not impugn the novelty of claims 1 or 7.

US '442

93 US '442 describes an apparatus for treating air comprising an ozonising lamp 30 generating UV at mainly 185nm, a catalyst layer 34 and a sterilising 254nm UV lamp 38 downstream of the catalyst. A function of lamp 38 is stated to be to decompose any residual ozone. Fig 1 is reproduced below:



94 Airscience's statement at paragraph 32 says in relation to US '442 *"The UV lamps are located either side of the catalyser housing a catalyst and thus the air located in the catalyser is being exposed to UV at a wavelength that creates ozone at the same time as being exposed to UV at a wavelength that decomposes ozone*".

95 Mr Howard reiterated a point made in his skeleton argument (paragraphs 95 and 96) which says that in the patent "*ozone is generated in the fluid and at the same time as it is being generated the ozone is exposed to UV which decomposes it and a catalyst that also decomposes the ozone...It is plain to see this does not occur in US '442*".

96 In his evidence Mr Morris said that he interpreted US '442 as *"a development of US 4,990,311 in that the same principles are used to generate ozone and destroy it*".The considerations that applied to US '311 apply equally to US '442 in terms of the sequential treatment of a pocket of air.

97 It is clear to me that the generation and decomposition of ozone in this apparatus do not happen in the same pocket of air, as these processes occur on either side of the catalyst. Moreover, the UV lamp(s) and the catalyst in are not "adjacent relative to the direction of flow" as I have construed this phrase in claims 1 and 7. I find therefore that claims 1 and 7 are novel over US '442.

Inventive step

98 As mentioned above, the *Pozzoli* test, which modified the test of the Court of Appeal in *Windsurfing,* is the established legal test for assessing inventive step. It comprises the following steps:

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.

99 Before dealing with the substantive question, I must address Wallenius’s argument that because Airscience had not made out their submissions on inventive step clearly in line with the approach set out in *Pozzoli*, I should reject this line of attack. While I agree that I have to apply the *Pozzoli* test, I have no difficulty fitting the arguments put in person by Mr Dewsbery and in the papers previously filed into that framework, and I do not see that Wallenius has been disadvantaged by not having been presented with arguments structured along the lines of *Pozzoli*. In what follows, I will apply the test following the order of Mr Howard’s submissions and will draw upon Airscience’s arguments in relation to each of the points at issue.

Step 1(a) Identify the notional “person skilled in the art”

100 In *Technip* at paragraphs 6-7, Jacob LJ gave a summary of some of the attributes of the “skilled person:

> “*It is settled that this man, if real, would be very boring – a nerd. Lord Reid put it this way in Technograph v Mills & Rockley [1972] RPC 346 at p.355"… the hypothetical addressee is a skilled technician who is well acquainted with workshop technique and who has carefully read the relevant literature. He is supposed to have an unlimited capacity to assimilate the contents of, it may be, scores of specifications but to be incapable of scintilla of invention. When dealing with obviousness, unlike novelty, it is permissible to make a "mosaic" out of the relevant documents, but it must be a mosaic which can be put together by an unimaginative man with no inventive capacity...The no-mosaic rule makes him also very forgetful. He reads all the prior art, but unless it forms part of his background technical knowledge, having read (or learnt about) one piece of prior art, he forgets it before reading the next unless it can form an uninventive mosaic or there is a sufficient cross-reference that it is justified to read the documents as one...The man can, in appropriate cases, be a team –an assembly of nerds of different basic skills, all unimaginative.”*

101 Mr Howard submitted that in light of *Technip* “*the skilled person would be a skilled technician well acquainted with workshop technique in the field*”.

102 I agree. Having considered the material and submissions before me I consider that at the priority date the skilled person(s) would be a technician or team of technicians in the field of cleaning and sterilising air with ozone-related products.

Step 1 (b) Identify the relevant common general knowledge

103 To quote Sachs LJ at page 482 of *General Tire*[16]:

> "*The common general knowledge inputed to such an addressee (the skilled addressee) must, of course, be distinguished from what in patent law is regarded as public knowledge....As regards patent specifications it is the somewhat artificial....concept of patent law that each and every specification, of the last 50 years, however unlikely to be looked at and in whatever language written is part of the relevant public knowledge if it is resting anywhere in the shelves of the Patent Office. On the other hand, common general knowledge is a different concept derived from a commonsense approach to the practical question of what would in fact be known to an appropriately skilled address-the sort of man, good at his job, that could be found in real life"*.

104 Mr Howard asked Mr Morris in cross-examination if he would describe any of the patent documents cited as common general knowledge. Mr Morris replied "C*ertainly as a practising engineer I have not come across them before....In my field. The patent specifications I would not expect to be common general knowledge amongst practising engineers*". From this, and in the light of *General Tire*, it is thus clear that none of the cited patents forms part of the common general knowledge.

105 Mr Howard submitted in his skeleton argument (paragraph 112) that "*the skilled person would have had a working understanding of ozone chemistry, radical chemistry and fluid mechanics. It was not within the skilled person's CGK to apply water treatments to air, or vice versa, because the skilled person considered water and air treatments to be different technologies at the priority date*". He went on to say that Prof Reitberger confirmed this in his evidence (paragraph 58) by saying "*I am of the view that at the priority date of the Wallenius patent, the treatment of air and of water with ozone and UV light were considered to be different technologies*".

106 In their statement (paragraph 52) Airscience suggest that on the basis of the disclosures of US '442, US '356 and US '311 and the "*common general knowledge at the time*" it was known to decompose ozone with catalysts.

107 I would agree with both Mr Howard and Mr Dewbery here. I would expect the skilled addressee to have an understanding of ozone chemistry, free radical chemistry and fluid dynamics. They would understand that ozone could be both generated and decomposed by different wavelengths of UV light, namely 185nm and 254nm, respectively, and also understand that ozone can be broken down by a catalyst. They would also understand that different considerations apply to ozone and UV interactions in aqueous and gaseous fluids and that ozone is well known as a decontaminant for air and water.

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[16] The General Tire and Rubber Company v The Firestone Tyre and Rubber Company Limited and Others [1972] RPC 17

Step 2- Identify the inventive concept

108 Mr Howard submitted that the "*whole aim of the patent is to maximise free radical content in the fluid because free radicals interact universally with contaminants.... The catalyst and UV-generating member are also side-by-side to facilitate this action as the fluid flows. The concept is put well in the patent: 'The catalysts, which are placed in the area 5, render the process more effective by increasing the amount of free radicals*'"

109 Column 5 lines 37-47 of the description of the patent reads "*The ozone molecules formed are at the same time decomposed by radiation within the abovementioned wavelength range, especially at a wavelength of 254 nm. At the same time, the O_2 (sic) formed is broken down to form atomic oxygen. In order to increase the efficiency during generation of free radicals, in particular HO radicals, oxides are added as catalysts. In order to obtain a greater amount of ozone and consequently more free radicals, further ozone is generated before the medium is irradiated*".

110 Mr Morris expresses the view in his evidence (paragraph 3.8.8) that "in *essence, EP 0800407 seeks to reconfigure the arrangements of UV emitters and catalysts so as to maximise exposure time and proximity to the region where O_3 generated.*"

111 In his closing remarks, Mr Howard submitted *"It emerged that there was some confusion from the cross-examination...about the generation of radicals. Mr. Morris conceded that, in fact, we are generating both oxygen atoms, nascent oxygen, which are oxygen radicals, together with hydroxyl radicals arising from water and that there are also radicals produced by reaction with contaminants, and all of those form a chain reaction. In particular, reactive atomic oxygen reacts with oxygen to form ozone. It reacts with water vapour. It reacts with ozone itself to form molecular oxygen. There is a cycle going on here*".

112 As I understand it the salient points of Mr Howard's argument are that although direct reactions between atomic oxygen and contaminants (in air) are rare, there is a cycle of reactions going on in which free radicals, atomic oxygen, hydroxyl radicals and radicals produced by the reaction of these species with contaminants.

113 I accept this view and accordingly consider that the inventive concept of both claims 1 and 7 lies in a process involving increasing free radical production, in which ozone is continually generated and broken down with UV in the presence of a catalyst where the UV source and catalyst are arranged adjacent to each other across the direction of flow of the fluid stream.

Steps 3 and 4 - Identify the differences if any between the matter forming the state of the art and the inventive concept. Do these differences constitute steps which require a degree of invention?

114 The state of the art to be considered in this case comprises the patent documents that have been cited.

115 Airscience makes arguments in relation to inventive step based on each of US 311, US ‘442 and US ‘461 separately and also in relation to US ‘461 in combination with US ‘ 311, US ‘442, US ‘907 and US ‘356.

US ‘311 and US ‘442

116 Airscience’s arguments in relation to US ‘442 can be summarised by the following quote from their amended statement: “*even if the claim were to be interpreted as meaning that the catalyst and UV generating member are side by side*” this would be “*an obvious workshop variation that, in particular when the fluid is air, would not demonstrate an ‘inventive step over the disclosure’ of US ‘442*”.

117 Similarly, in relation to US ‘311 Mr Dewsbery said “*we* (for which I read “the skilled person”) *have taken exactly the same chamber and we have turned the lamps around the other way... it is a box which is reversed around the other way, so there is nothing new, nothing inventive*...*this is a workman-like improvement, but it is certainly not a new invention...the exact juxtapositions of the catalyst and UV member would be irrelevant, provided that the photons of UV reach the catalyst, and thus located within several metres of each other*” [this was a reference to the fact that UV photons travel at the speed of light].

118 In relation to both US ‘311 and US ‘442 Mr Dewsbery put it to me that *“If we took the patent of the defendant and we took patents US ‘311 and US ‘442, if we break it back into basics, we have within a given chamber a 185nm waveband lamp. We will also have a 254nm lamp, both of which irradiate a catalyst. Whichever way they are put, be they vertical, be they horizontal, they are still irradiating the catalyst... the actual functionality of any of these three products is to all intents and purposes irrelevant. That actual performance would be the same”.*

119 As I understand it, Mr Dewsbery poses two questions – (i) is it obvious to orientate the lamps and catalyst as Wallenius’s patent has done, rather than sequentially, upstream and downstream?; (ii) even if the lamps are not orientated as claimed the outcome of the prior art apparatus is the same as in the patent - the increased production of free radicals - and therefore does not involve an inventive step.

120 Mr Howard referred me to *Haberman*[17] which points out the need to be wary of using hindsight when assessing obviousness. The question of obviousness needs to be approached from the position of the skilled person at the priority date looking forward. *Haberman* is also helpful as it lays out a number of questions which can be used as guidance in assessing step 4. Of particular note is the question of what problem did the patented invention try to address.

121 I shall now consider the arguments relating to each of the citations in more detail.

US ‘311

122 Mr Howard referred me to the passage in US ‘311 column 3 line 25 which reads “*Ozone is produced by the ozone-generating ultraviolet lamp 20 from oxygen in the*

[17] Haberman and another v Jackel International Limited [1999] FSR 683

air to convert the gas mixture into an ozone-prevailing atmosphere. Thereafter, the ozone ... is decomposed by the catalyst layer 17 and the ozone-decomposing ultraviolet lamp". It is clear from this that in US '311 the first lamp is a preparatory step for making ozone.

123 In relation to the second 254nm lamp Mr Howard said "*the thrust of US '311 is that ozone itself degrades the catalyst. Therefore the aim of '311 is to reduce the burden of ozone on the catalyst and preserve the life of the catalyst*". I agree that it is at least an aim of the second UV lamp to help regenerate the catalyst. This is evident from column 3 lines 38-44 which reads "*the ozone reducing lamp not only reduces the burden in the catalyst in decomposing ozone, but also generates....nascent state oxygen which reacts inversely to the deteriorating reaction of the catalyst, thereby reactivating the catalyst and preventing its deterioration*".

124 It is therefore clear to me that the purpose of the orientation of lamps and catalyst in US '311 is different from that to which the inventive concept of the patent is directed.

125 Mr Dewsbery's second point in relation to US '311 is that the three elements of the reaction will take place at the same time and that free radicals will be produced, irrespective of the respective positions of the lamps and catalysts.

126 In his written evidence (paragraph 3.8.10) Mr Morris expressed the opinion that *"if free radicals are an essential element for the intended process then maximising their generation is obvious"*. During his re-examination by Mr Dewsbery, in the course of which Mr Dewsbery had referred to the Wallenius patent in comparison with US '442 and US '311, Mr Morris said "*as an engineer I see little difference between operating that process in parallel or in sequence*". He went on to say "*The one concern that I would have about the process operating in parallel is that if we set up atomic oxygen at the same time as we are generating ozone, O_3, there is a risk because the atomic oxygen is ionic that it will simply re-bond with the oxygen and you will not have....the free radical oxygen because it is recombined. To determine the efficacy of parallel or sequential operation quite frankly would require testing to be carried out*".

127 Prof Reitberger's evidence (paragraph 16) in relation to this point says "*it is a faint hope that nascent oxygen radicals in competition with these reactions (nascent oxygen with oxygen, ozone and water vapour) can contribute in a significant way to the destruction of malodorous and other contaminants in the air".* Prof Reitberger (paragraphs 50 to 52) goes on to suggest that free radical production is maximised by the three "simultaneous" reactions in the Wallenius's patent. As I read it Prof Reitberger's evidence gives some support to the notion that free radicals are maximised by the process of claim 1 although he is sceptical about the effectiveness of these free radicals in sterilising air.

128 So both experts raise questions about the effectiveness of the claimed process to produce free radicals. However, the evidence provides no basis for me to conclude that free radicals will not be produced to a greater extent by the present invention in question when compared with US '311. The inventive concept of the patent includes generating ozone at the same time as it is broken down in a discrete pocket of air - this feature is not present in US '311.

129 In summary, I therefore find at least two differences between the inventive concept and US ‘311: (i) the orientation of the lamps and catalyst which are configured for a different purpose in US ‘311 and (ii) that the apparatus in US ‘311 generates free radicals in a different way to the inventive concept. There is nothing in any of the arguments or material before me which could persuade me that the skilled person in possession of the common general knowledge as defined above could bridge these differences without the application of inventive ingenuity.

US ‘442

130 In this document the second lamp, generating UV at 254nm, is clearly downstream of the catalyst. In their statement (paragraph 40) Airscience submitted “*However on closer inspection of US ‘442 it is clear that a discrete pocket of gas mixture located within the catalyst layer (34) will be simultaneously exposed to both the UV from the ozone generating lamp (30) and the UV from the ozone decomposing lamp (38) as well as the catalyst layer*. This was reinforced by Mr Dewsbery’s submissions which I have quoted above.

131 In his evidence (paragraph 3.7.1), Mr Morris makes the point that “*in terms of the essential function and configuration of the device* [set out in US ‘442] *for treating air*, *there is no obvious inventive step”* that distinguishes it from the patent.

132 Mr Howard pointed out that in US ‘442, air is divided two parallel streams, namely a deodorising/sterilising passage and a bypass passage. The apparatus functions in two modes depending on whether it is acceptable for ozone to be emitted.

133 Thus, in the first mode ozone is present in the air leaving the apparatus through the bypass and serves to deodorise a room. In the second mode air passes through the deodorising/sterilising passage in order to break down the ozone present before exiting the apparatus, as ozone is harmful. It is this latter mode that requires more detailed consideration here.

134 Mr Howard submitted “*A skilled person, starting from ‘442, would have seen no advantage in arranging a catalyst so that it could be irradiated by the ozone generating lamp 30, let alone placing the catalyst adjacent to the lamp. On the contrary, the catalyst is carefully positioned in ‘442 so that it only interacts with the ozone after the ozone atmosphere has been generated in the first mode and does not interfere with the ozone bypass passage 24”*.

135 I agree with Mr Howard on this point. It is clear that the apparatus of US ‘442 is intended to use ozone to deodorise the airstream, and the 254nm lamp serves both to “mop up” any residual ozone before it exits the apparatus and to have a deodorising effect itself. For example column 1, lines 24-27 in US ‘442 reads “*However, since ozone is harmful to the human body, such an apparatus must have an ozone removing means before exhausting the treated air*”. Column 4, lines 38-43 reads “*The sterilizing ultraviolet ray lamp 38 decomposes the ozone only when there is residual ozone. The thus processed air which has been made unharmful is exhausted out of the apparatus 10 through the outlet 14 by means of the fan 18*”.

136 US ‘442 does suggest that the lamps can be re-orientated but crucially this is to control the concentration of ozone exiting the apparatus. Column 5, lines 17-20 reads “*In addition, by adjustably setting the location of the ozonizing ultraviolet ray lamp 30, it becomes possible to intentionally include a predetermined amount of ozone in the exhausted air*”.

137 I can find nothing in US ‘442 that would lead the skilled addressee to consider aiming the 254nm lamp in the same area as the 185nm lamp. The reasons for adjusting the 254nm lamp in US ‘442 are to control ozone egress.

138 Mr Dewsbery also invited me to consider the question of whether there are any inventive differences between the ways in which free radicals are produced in the patent compared with US ‘442, and if so, whether those differences are obvious.

139 I have already referred to Mr. Morris’s written evidence at paragraph 3.8.10 where he says that if free radicals are an essential element for the effectiveness of the intended process then maximising their generation is obvious. In contrast, Prof Reitberger says (paragraph 94 of his statement) “*The technical objective towards which the methods and apparatus of US ‘442 are directed is fundamentally different in US ‘442 to that of the Wallenius patent. In particular, US ‘442 is directed to use of ozone to sterilise air in a room. In contrast, the Wallenius patent seeks to destroy contaminants in a fluid not by the direct action of ozone but by maximising the generation of free radicals”*.

140 With reference to Mr Morris’s point, Mr Howard submitted “*But US ‘442 does not teach a person to maximise free radicals. The aim of US ‘442 is to deodorise a room. It can be done in two modes. The first mode is where the ozone is destroyed and the second mode is where some of the ozone is allowed to escape. But it is not addressing the essential element of the patent which is maximising the free radicals. In US ‘442 you are generating an ozone prevailing atmosphere. In the patent you are effectively destroying the ozone as soon as it is created in order to maximise the radical concentration. They are quite different concepts*”.

141 Thus, while US ‘442 does refer to production of free radicals, I agree that it is directed to solving a different problem to that of the inventive concept in the patent. In a discrete pocket of air passing through the apparatus in US ‘442, radicals are decomposed after they have been generated. The generation of radicals in US ‘442 happens by a different mechanism to that which I have defined in the inventive concept. Furthermore, because the arrangement of the lamps and catalysts differs between US ‘442 and the inventive concept I consider that the differences between US ‘442 and the inventive concept are not obvious.

US ‘461

142 Mr Dewsbery did not address me on ‘US 461 at the hearing and I note that Mr Morris considers it less relevant than US ‘311 or US ‘442.I will nevertheless briefly discuss the arguments made in relation to US ‘461 in Airscience’s statement.

143 Fig 2 of US ‘461 is as follows:

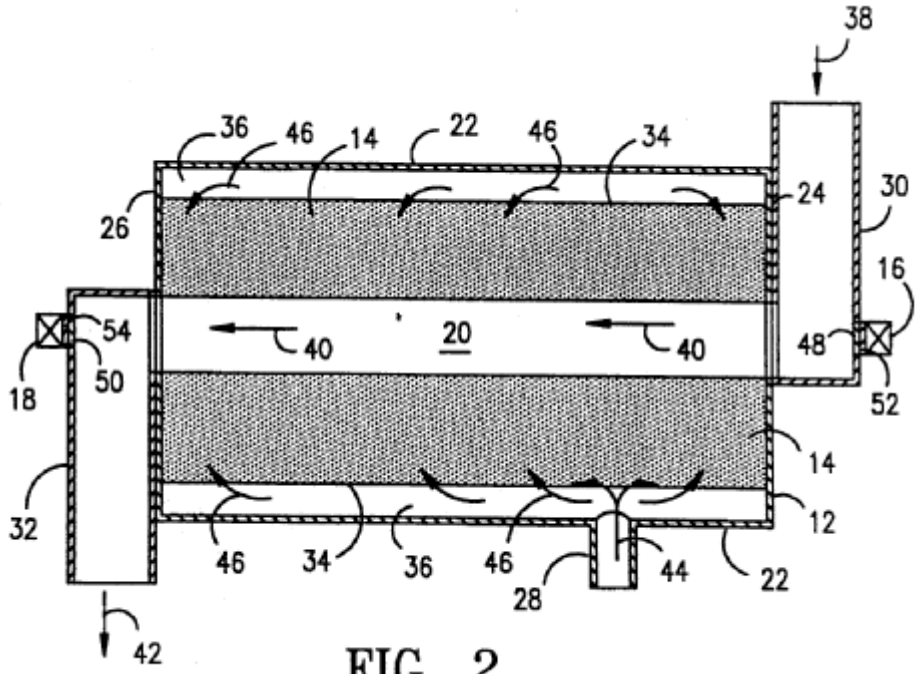

FIG. 2

144 An aqueous stream flows in channel 20. Ref 16 denotes a light source emitting UV at 254nm and ref 18 an 185nm UV light source. Ref 14 denotes a porous element which the description says may contain a catalyst.

145 Thus, US ‘461 relates to the treatment of water and not air. Airscience’s statement (paragraph 50) acknowledges that “*the reactions that take place when the fluid is air are quite different to when the fluid is water*”. As I have mentioned above Prof Reitberger expressed the view that the treatment of water and air were different technologies. I therefore have immediate reservations about the relevance of this document in relation to the treatment of air.

146 Airscience’s first ground for arguing lack of inventive step is based on their interpretation of the expression “relative to the direction of flow”, on the same lines as argued for US ’311 and US ‘442. In line with my conclusions on this point above, I consider that this difference is not obvious, especially more so in relation to US ‘461 as it relates to the treatment of water.

147 Airscience’s second line of argument is also along similar lines to their arguments in respect of US ‘311 and US ‘442. Essentially, they say that even if the catalyst and lamp are to be construed as side by side then the patent claims a workshop variant of US ‘461. Airscience made the same argument that I have referred to in relation to US ‘311 above - that the juxtapositions of the catalyst and lamps are irrelevant given the speed at which UV photons travel.

148 Mr Howard submitted that “*The central teaching of this document (US ‘461) is to treat an aqueous stream with two distinct steps, and this is column 2, line 33. The first step can involve a source of UV at 254 which decomposes ozone. That is at column 6, line 7. The second step can involve a source of UV at 185 which*

generates ozone. That is at column 6, lines 12 to 41. However, the document is absolutely explicit that the first UV source must be turned off before the second is turned on (column 2, line 40). It says, 'This UV source is then turned off'."

149 Mr Howard further submitted that the device in US '461 would require a "*complete overhaul*" to arrive at the invention in the patent. I would agree. I note that the lamps in US '461 are working sequentially in the opposite order to that described in the patent. In US '461 the ozone is first decomposed by UV at 254nm and then after this lamp is switched off UV at 185nm can be used to generate hydroxyl radicals. I also note that the catalyst is optional in US '461.

150 Airscience's third line of argument is that US '461 when considered with US '311, US '907 or US '356 renders the patent obvious.

151 In particular, Airscience say that while US '461 does not disclose treating ozone with UV at the same time as it is generated, US '907 and US '311 do disclose this. They suggest therefore that US '461 should be considered together with US '907 or US '311.

152 Airscience further suggest that the catalysts disclosed in US '356 and US '442 could be incorporated into the device in US '461.

153 It is well established that material from different documents can only be combined to make a "mosaic" under certain conditions, for example, where one of the documents includes a reference to the other, or where one document can be accepted as establishing common general knowledge in connection with which the disclosure of another document would naturally be considered. It is not acceptable simply to combine two documents to make a case for obviousness in the absence of reasons to do so. This point was made in *Technograph* to which I have referred above.

154 In their statement (paragraph 51) Airscience suggest that they think US '311 or US '907 can be combined with US '461. They say US '461 "*discloses the invention in each of claims 1 and 3 to 5 except from the feature that...the ozone that is generated is exposed to UV radiation at the same time it is generated with at least one UV generating member*"'. They go on to point out that US '311 and US '907 disclose the simultaneous treatment of fluids with two different UV wavelengths.

155 They do not give any reasons, however, why they think the skilled addressee would be inclined to read these documents in combination. Wallenius point out that US '907 relates to the treatment of organic waste gases. I cannot see any reason why the skilled addressee would consider combining the teaching of US '461, which relates to the treatment of water, with the UV lamp configurations in US '311 and US '907. They lie in different areas of water and gas treatment and are directed at quite different purposes.

156 In a further line of argument, Airscience suggest that the catalysts in US '311, US '442 or US '356 could be incorporated as a catalyst near the 254nm lamp in US '461. However, I do not see any reason to do this. Firstly, as I have already said the latter lies in the field of water treatment, whereas the other prior art documents concern the treatment of air. Moreover, as I have said above the problem that US '311 seeks to address is different from that embodied in the inventive concept in suit. Similarly,

US ‘442 also concerns a different problem - the decomposition of ozone by the 254nm lamp is to control its egress from the apparatus.

157 For the above reasons I conclude that the amended patent claims are not rendered obvious by any of the cited documents either alone or in combination.

Decision

158 I have found that the claims of the patent as proposed to be amended are clear and sufficient, do not contain added matter or extend the scope of protection, and are novel and inventive over the prior art cited in the proceedings.

159 I therefore allow the patent to be amended as set out above and refuse Airscience’s request that the patent be revoked.

Costs

160 Tribunal Practice Notice 4/2007 sets out the scale of costs applicable to proceedings before the comptroller after December 2007. Although both parties have requested costs, they have made no further submissions on the point, and I see no reason to depart from the comptroller’s scale.

161 In the previous decisions in these proceedings costs were deferred. Although Wallenius have finally won, they only did so having made an unconditional offer to amend their patent. They were also not successful at all points in the run up to the substantive hearing. It is therefore appropriate to apportion costs according to the outcome at each stage.

162 In summary, the outcomes of the previous decisions were as follows:

- In my decision on the papers dated 16 April 2013 (BLO/156/13) I found against Wallenius on their pleading for security for costs but granted their request for a preliminary hearing on the question of estoppel. I regard honours as even at this stage.

- In my decision on the papers of 29 August 2013 (BLO/350/13) I found in Airscience’s favour on the question of estoppel, which was the single point at issue in that decision. Following that decision, Wallenius made an unconditional offer to amend which necessitated the preparation of an amended statement and counterstatement.

- In the third decision resulting from the telephone case management conference on 19 August 2014 (BLO/370/14) the hearing officer found in favour of Airscience on two points and against them on one point.

163 I note that Airscience have made use of professional advice at the earlier stages. They were represented by Mr Dewsbery in person at the case management conference on 19 August 2014, although he received some assistance from his patent attorneys in preparing for it. I have therefore reduced the element relating to actual attendance at the

case management conference to take into account the fact that there would have been no professional fees associated with that component.

164 I have broken down the costs as follows:

Wallenius costs - substantive hearing 31 October 2014	£
Preparation of statement and considering Airscience's statement	500
Preparation of evidence and considering Airscience's evidence	1000
Preparing for and attending the hearing	750
Total costs awarded to Wallenius = £2250	
Decision of 16 April 2013	Nil
Airscience costs - Decision 29 August 2013	
Preparation of papers and considering Wallenius's papers	300
Airscience costs - case management conference 19 August 2014	
Preparing for and attending the hearing	200
Total costs awarded to Airscience = £500	

165 I accordingly order that Airscience pays the defendant Wallenius the sum of £1,750, the deadline for payment being seven days after the expiry of the period for appeal.

Appeal

166 Any appeal must be lodged within 28 days.

A C Howard

Divisional Director
Acting for the comptroller