Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 17 June 2015

Case Number: T 1112/12 - 3.2.01

Application Number: 05804755.6

Publication Number: 1737729

IPC: B64D37/32

Language of the proceedings: EN

Title of invention:
METHOD AND APPARATUS FOR GENERATING AN INERT GAS ON A VEHICLE

Patent Proprietor:
The Boeing Company

Opponent:
Airbus Operations Limited(GB) / AIRBUS SAS(FR) / Airbus Operations SAS(FR) / Airbus Operations GmbH (DE) / Airbus Operations SL(ES)

Headword:

Relevant legal provisions:
EPC Art. 56, 123(2)
RPBA Art. 12(4)

Keyword:
Admission of request into appeal - (yes)
Admission of new arguments - (yes)
Amendments - intermediate generalisation (no)
Deletion of embodiment from granted claim not open to objection under Article 84 EPC
Inventive step - (yes)

Decisions cited:
G 0003/14, T 1459/05, T 0656/07

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 1112/12 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 17 June 2015

Appellant: (Patent Proprietor)	The Boeing Company 100 North Riverside Plaza Chicago, IL 60606-1596 (US)
Representative:	Boult Wade Tennant Verulam Gardens 70 Gray's Inn Road London WC1X 8BT (GB)
Respondent: (Opponent)	Airbus Operations Limited(GB) / AIRBUS SAS(FR) / Airbus Operations SAS(FR) / Airbus Operations GmbH (DE) / Airbus Operations SL(ES) New Filton House Filton Bristol BS99 7AR (GB)
Representative:	Ribeiro, James Michael Withers & Rogers LLP 4 More London Riverside London SE1 2AU (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 1 March 2012 revoking European patent No. 1737729 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	G. Pricolo
Members:	W. Marx
	O. Loizou

Summary of Facts and Submissions

I. The appeal of the patent proprietor is directed against the decision of the opposition division posted on 1 March 2012 revoking European patent No. 1 737 729.

II. In its decision the opposition division held that granted claims 1 and 3 and also claim 1 according to auxiliary requests 1 and 3 contravened Article 123(2) EPC, whereas claim 1 according to auxiliary request 2 did not comply with the requirements of Article 84 EPC and claim 1 according to auxiliary request 4 resulted from an obvious combination of the following documents:
A1: US2004/0000353; and
A2: US3587618.

III. Together with its grounds of appeal dated 10 July 2012 the appellant filed four auxiliary requests. Additional fifth, sixth and seventh auxiliary requests were filed by letter of 15 May 2015.

IV. Oral proceedings before the board took place on 17 June 2015, during which the appellant filed as its main request a clean copy of the claims according to the first auxiliary request filed with letter dated 10 July 2012, and withdrew all other requests.

The appellant (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained on the basis of claims 1-21 of the main request, filed during the oral proceedings, and the description and figures of the patent as granted.

The respondent (opponent) requested that the appeal be dismissed.

V. Claim 1 according to the main (and sole) request reads:

"A fuel system for a vehicle (52), comprising an inert gas generating system and a fuel tank (28; 66) having a fuel tank vent (68) for venting and supplying gas to the fuel tank (28; 66) and a fuel tank valve (122) for supplying gas to the fuel tank (28; 66), said system comprising:

an inlet (22; 70) for receiving a flow of gas having a nitrogen component and an oxygen component from a gas source;

a heat exchanger (24; 72; 82) downstream from the inlet (22; 70) and in fluid communication with the inlet (22; 70) for cooling gas received from the inlet (22; 70);

a gas separation module (26; 74; 106) downstream from the heat exchanger (24; 72; 82) and in fluid communication with the heat exchanger (24; 72; 82) for separating gas received from the heat exchanger (24; 72; 82) into a nitrogen-enriched gas flow and an oxygen-enriched gas flow;

characterized in that

said gas separation module (26; 74; 106) is adapted to deliver nitrogen-enriched gas from the nitrogen-enriched gas flow to the fuel tank (28; 66) through the fuel tank vent (68), and through the fuel tank valve (122) to the fuel tank without delivering the nitrogen-enriched gas through the fuel tank vent."

The corresponding method claim 18 reads as follows:

"A method of generating inert gas on a vehicle (52) for supplying the inert gas to a fuel tank (28; 66) having a fuel tank vent (68), said method comprising:

supplying a flow of gas having a nitrogen component and an oxygen component to a gas separation module (26; 74; 106);

separating the flow of gas into a nitrogen-enriched gas flow and an oxygen-enriched gas flow using the gas separation module (26; 74; 106), wherein the nitrogen-enriched gas flow has an oxygen concentration low enough that the nitrogen-enriched gas flow is generally inert;

characterized by

delivering nitrogen-enriched gas from the nitrogen-enriched gas flow to the fuel tank (28; 66) through a fuel tank vent (68) for venting and supplying gas to the tank (28; 66), and through a fuel tank valve (122) for supplying gas to the tank (28; 66) without delivering the nitrogen-enriched gas through the fuel tank vent."

VI. The appellant essentially argued as follows:

The current request addressed the issues discussed in opposition proceedings. Language from claim 1 of the PCT application was added to independent claims 1 and 18, and the words "or into the fuel tank" were deleted from granted claim 3 to bring it into line with claim 3 of the PCT publication. The "valve" stemming from claim 3 as filed "controlled" - although not explicitly mentioned - a flow of fluid, and claim 1 only specified where the nitrogen-enriched gas (NEA) was delivered to, so there was no need to further define the piping.

The contested decision failed to take into account some fundamental differences between a stored nitrogen-type inerting system, such as that of A2 storing liquid nitrogen, and on-board inert gas generating systems (in short: "OBIGGS"), in which the rate of removal of

oxygen was limited. There was a trade-off in OBIGGS between producing a larger volume of inerting gas at a higher oxygen concentration or a lower volume at a lower oxygen concentration.

Closest prior art document A1 already solved the problem of how to deliver the nitrogen-enriched gas flow from the gas separating module to the fuel tank at a multiplicity of unique flow rates corresponding to different operating conditions of the aircraft. Stating the problem as "how to provide alternative ways of distributing the nitrogen-enriched gas flow to the fuel tank" already provided a pointer towards the invention.

A1 related to an OBIGGS-type system of continuous-flow type, in which the rate of production of nitrogen-enriched air (NEA) was limited, and to commercial aircraft, which were less demanding on NEA production rates due to lower descent rates (paragraphs [0005], [0006]) than the military aircraft as described in A2, which was subject to severe manoeuvres such as pitching, rolling or yawing. In A1 (paragraphs [0008], [0020] and [0022]) NEA was delivered directly to the fuel tank ullage and introduced at a higher rate when external air was in high influx to the ullage. A technical problem addressed by the invention was how to more effectively use a limited rate of on-board NEA generation to reduce the oxygen concentration in the ullage gas.

A1 aimed at minimising the quantity and complexity of OBIGGS that, in previous applications, had proved heavy and costly for both acquisition and operation. The teaching of old document A2 was quite different in many ways. The inerting gas in A2 was stored on-board in liquid form, so the problem of limited on-board

generation rate was not relevant to A2. Pure nitrogen gas was provided to a fuel tank ullage in A2, whereas A1 described the use of nitrogen-enriched air of oxygen levels up to 9-10% by volume, which led to different technical considerations, so the skilled person would not look to A2 for solving problems relating to A1 involving on-board generation of NEA. In A2 in the arrangement shown in Figure 5 (or Figure 7), nitrogen for pressurisation was discharged into the fuel tank via the vent passage rather than directly into the fuel tank (as shown in Figure 1). The purpose of the spray nozzle arrangement injecting nitrogen into the fuel tank was only to scrub oxygen from the fuel, but not to control the pressure in A2 or to reduce the oxygen content of the ullage gas.

Even if the skilled person did consider delivering NEA to the fuel tank through the fuel tank vent on the basis of the disclosure of A2, the use of a fuel scrubbing arrangement in A2 would not suggest to him to deliver NEA - containing a certain oxygen level - for scrubbing purposes directly to the fuel tank. Nitrogen passing through the scrub nozzles in A2 was rather a side-effect, not intended for pressurising the tank (column 5, lines 25 ff). Discussing inventive step was a matter of motivation for the skilled person to combine different teachings, not of simply cutting and combining pieces. A1 was concerned with minimisation, whereas A2 related to a highly controlled system, comprising a heat exchanger for vaporising the liquid nitrogen, managing rapid introduction of nitrogen and controlling the fuel tank pressure to guard against overpressure and bursting of the tank. A1 already specifically taught (paragraph [0020]) that NEA was directed to the fuel tank ullage directly and mentioned that air was forced in through tank vents during

descent (paragraph [0022]), but the reasons for directing nitrogen to the vent in A2 were not applicable in A1.

A2 as closest prior art required a bursty flow of nitrogen (column 5, lines 27 ff: opening pressure of relief valve 113 of 40 p.s.i.), which was not possible with an OBIGGS providing a slow, continuous flow of NEA.

VII. The respondent's arguments regarding the present decision can be summarised as follows:

The current request could have been presented during the opposition proceedings and should therefore not be admitted. In particular, the appellant had had enough chances in opposition proceedings to file such a request. The same applied to a number of new arguments in support of inventive step which had not been presented in opposition proceedings.

In current claim 1 not all valve-related features with regard to the fuel tank valve, which was originally disclosed in claim 3 as filed, had been included, resulting in an intermediate generalisation. In particular, as per claim 3 as filed, the valve was "operatively connected between the gas separation module and the fuel tank to control a flow rate of nitrogen-enriched gas into the fuel tank". Instead of controlling a flow rate, the valve of claim 1 was "for supplying gas to the fuel tank" and the supply was "through the fuel tank valve". Moreover, the term "operatively connected" in original claim 3 showed that the valve was not part of the gas separation module.

Claim 1 was amended to specify a parallel delivery arrangement which could only be achieved by providing valves. Therefore, essential features were missing in claim 1, which rendered the claim unclear.

Starting from A1 as closest prior art, which did not show any details in that respect, the objective problem was how to deliver NEA to the fuel tank (see also paragraph 13.5 in the contested decision: "in order to decide how to distribute the nitrogen"). When looking for a solution, the skilled person would have found A2 and the parallel arrangement for introducing gas into the fuel tank, i.e. the characterising features of the independent claims. The difference between A2 and A1 merely reflected the progression in technology from using an onboard source of nitrogen towards OBIGGS. The skilled person would have recognised the difference in the source of nitrogen, and if OBIGGS had been available at the time of A2, no doubt such a system would have been used because the dewar in A2 could have been replaced with the OBIGGS of A1 (or vice versa) with no technical difficulty. When the air separation module ASM of A1 was operated at low flow rates, the oxygen concentration could be sufficiently low to make it suitable for use in a scrubbing operation as in A2. A2 provided a solution to a properly formulated technical problem, i.e. an alternative method of distributing the nitrogen-enriched gas into the fuel tank. The spray nozzles in A2 resulted in an increased pressure in the fuel tank and kept the oxygen concentration in the ullage below an explosive level by means of the nitrogen bubbles. There was no relation to the problem of overpressure, and the rapid introduction of nitrogen in A2 did not constitute a technical barrier for the combination of A1 and A2. The skilled person would keep the piping system of A1 and implement

the piping according to A2. Considering the high delivery of NEA required when descending, with A1 mentioning delivery to the fuel tank ullage at a multiplicity of flow rates, such delivery could also be realised by delivering NEA via the vent, in particular when taking into account the teaching of A2 and the problem during descent mentioned in A2 (see column 5, line 22). A2 showed (Figure 5) two routes for delivering NEA, via the tank scrub manifold and a large flow of gas to the tank via the vent.

Taking A2 as an alternative starting point for the problem-solution approach, the objective problem was to provide an alternative source of inert gas. Document A1 reflected the development from using onboard storage tanks (as in A2) to using OBIGGS (as in A1), a well-established technology for both military and commercial aircraft. A skilled person starting from A2 would have understood that the onboard storage tanks of A2 could be replaced by an OBIGGS as in A1. Due to the weight issue when having a separate nitrogen tank, he would be motivated - with least possible modification - to use the OBIGGS of A1 to provide a smaller, lighter system (see A1, paragraph [0036]).

Reasons for the Decision

1. Admission of new main request and of new arguments into appeal proceedings

1.1 The new main request as filed during the oral proceedings is admitted into the appeal proceedings.

Pursuant to Article 12(4) of the Rules of Procedure of the Boards of Appeal (RPBA, OJ EPO 2007, 536) an appeal board is empowered to hold inadmissible facts, evidence and requests which could have been presented in the first-instance proceedings. The boards of appeal thus retain discretion, as a review instance, to refuse new material, including requests (claim sets) which ought to have been, but were not, submitted during first-instance proceedings.

The main request filed during oral proceedings corresponds exactly to the first auxiliary request filed with the statement of grounds of appeal. Claim 1 also corresponds to auxiliary request 2 filed by letter of 16 December 2011 during opposition proceedings, except for some rewording and rearranging of the characterising features and the deletion of the additional features of originally filed claim 3, which specified the position of the fuel tank valve. Rewording of claim 1 (deletion of the expression "said gas separation module is adapted to deliver nitrogen-enriched gas from the nitrogen-enriched gas flow" in one of the first and second characterising features and combining both features by "and") results in a concise formulation of claim 1 without changing the claimed subject-matter. Moreover, as stated in the contested decision (paragraph 2.5), incorporating in claim 1 the fuel tank valve, stemming from original claim 3, without implementing all valve-related features disclosed in claim 3 did not amount to an intermediate generalisation, because "there is an overlapping, although expressed in different words with the features of claims 3 as filed".

Therefore, the current main request takes into consideration aspects of the contested decision and

tries to defend a version of the patent which was dealt with in first-instance proceedings. The board therefore did not see any reason to exercise its discretion not to admit the current main request.

1.2 In the contested decision, the opposition division concluded that the subject-matter of claim 1 of former auxiliary request 4 lacked an inventive step over closest prior art document A1 in view of the teaching of document A2. In appeal proceedings the appellant argued the issue of inventive step only in view of the combination of A1 and A2, i.e. the factual and legal framework of the case of the preceding opposition proceedings remains unaltered. The respondent has objected in its written submissions to the alternative technical problem suggested by the patentee. However, the framework of the discussion of inventive step is not changed by reformulating the problem to be solved.

The board therefore concludes that no new facts or submissions have been presented in appeal proceedings that may be disregarded by the board in the exercise of its discretion under Article 12(4) RPBA.

2. Allowability of amendments

2.1 In first-instance proceedings, objections had been raised against claims 1 and 3 as granted with regard to Article 123(2) EPC, i.e. basically referring to the ground of opposition under Article 100(c) EPC.

The alternative in claim 3 "or into the fuel tank vent", which was objected to in first-instance proceedings, has been deleted.

With respect to current claim 1, the respondent alleges an intermediate generalisation, because not all valve-related features of the fuel tank valve, as originally disclosed in claim 3, have been implemented. The board, however, agrees with the judgement of the opposition division that features already present in claim 1 overlap with the features of claim 3 as filed. In particular,if according to claim 1 the "gas separation module is adapted to deliver nitrogen-enriched gas flow to the fuel tank … through the fuel tank valve", then the fuel tank valve must be "operatively connected between the gas separation module and the fuel tank" as worded in original claim 3. Moreover, the implicit function of a valve is to control a flow rate of a fluid, i.e. the fuel tank valve as defined in claim 1 will "control the flow rate of nitrogen-enriched gas into the fuel tank", as worded in original claim 3.

As a consequence, the board judges that neither claim 1 nor claim 3 contains subject-matter extending beyond the application as filed.

2.2 The respondent also argues that the parallel delivery arrangement as specified by claim 1 could only be achieved by providing valves, and these essential features were missing. This appears to be a clarity objection similar to the issue raised by the opposition division (paragraph 6.4 in the contested decision) that "an unspecified selective gas delivery function to the fuel tank and to the fuel tank vent is allocated to the gas separation module (cf. *adapted to*)", whereas as conveyed by the overall disclosure of the patent "said delivery function is allocated to the valves 120 and 122 which are arranged in parallel downstream from the flow valve 118 downstream from the gas separation module".

Independent claims 1 and 18 are amended in comparison to their granted version. As regards the provisions of Article 101(3) EPC that require assessing whether the patent as amended meets the requirements of the EPC, the Enlarged Board of Appeal has ruled in decision G 3/14 of 24 March 2015 (OJ EPO 2015, A102) that "*the claims of the patent may be examined for compliance with the requirements of Article 84 EPC only when, and then only to the extent that the amendment introduces non-compliance with Article 84 EPC*" (see Catchword). Decision G 3/14 distinguishes between different types of amendment. Cases where one of alternative embodiments of a dependent claim is implemented in the independent claim are referred to (see paragraphs 3 and 82) as Type A(i) cases, for which the same ruling applies as in Type B cases where a complete dependent claim was literally inserted (see paragraphs 2 and 81), since a dependent claim specifying alternative embodiments can be written out as two or more dependent claims. For Type B amendments, a negative answer is given in G 3/14 to the question whether clarity has to be examined (paragraph 81). In this context, G 3/14 also concludes (paragraph 83) that the same result follows in the case of amendments consisting of the deletion of wording (to narrow the scope) or of optional features from a granted claim, "*leaving intact a pre-existing lack of compliance with Article 84 EPC*". Although not explicitly stated, a common theme underlying this ruling appears to be that modifying a claim by merely deleting or excluding embodiments from the claimed subject-matter does not result in an amendment which is open to an objection under Article 84 EPC.

In the board's judgment, the present case falls under the type of amendments which may not be examined for compliance with Article 84 EPC for the following reasons:
The characterising portion of granted claim 1 ("said gas separation module is adapted to deliver nitrogen-enriched gas from the nitrogen-enriched gas flow to the fuel tank through the fuel tank vent **and** through the fuel tank valve") defines a fluidic connection between the gas separation module and the fuel tank, i.e. between two nodes of a network delivering gas, and two elements - fuel tank vent and fuel tank valve - installed between the two nodes, without further specifying said installation. Installation of two elements in a network between two nodes can be either in parallel or in series. To put it differently, the expression "through the fuel tank vent **and** through the fuel tank valve" in the granted version of claim 1 encompasses at least embodiments which might be characterised by a first expression reading "**either** through the fuel tank vent **or** through the fuel tank valve" (i.e. in parallel), which could also be reworded as in current claim 1, and a second expression reading "through the fuel tank vent **and at the same time** through the fuel tank valve" (i.e. in series). The wording of claim 1 according to the current request now excludes a series installation as specific embodiment, which was objected to with regard to granted claim 1 in opposition proceedings for not being originally disclosed, and therefore one of the two embodiments possible under the wording of granted claim 1, which cannot introduce any non-compliance with Article 84 EPC by way of the amendment. In particular, claim 1 as granted already left open, although comprising a parallel arrangement, whether the piping of the fluidic connection between the gas separation module and fuel

tank had to comprise as essential features two valves, only one of which (the fuel tank valve) was - and still is - claimed.

The following is noted in this respect:

- In granted claim 1, "and" is not to be understood within the meaning of Boolean logic, which would exclude a parallel arrangement as defined by "either ... or" and which would be contradictory to the sole specific embodiment according to Figure 3 of the contested patent.
- An expression "either through A or through B" might be reworded to read "through A without through B, and through B without through A", or even "through A, and through B without through A", corresponding to the wording of current claim 1.

Moreover, the term "adapted to" already formed part of claim 1 as granted, so the clarity objection raised by the opposition division (see paragraph 6.4 of the contested decision) that "claim 1 must clearly specify which function is performed by which element", and that the selective delivery function cannot be allocated to the gas separation module itself, is not to be considered. It is also noted that the Enlarged Board in decision G 3/14 disapproved the line of diverging jurisprudence which was cited by the opposition division (T 1459/05, T 656/07) in exercising its discretion to examine the claim under Article 84 EPC.

3. *Inventive step (Article 56 EPC)*

3.1 The features of current claim 1 are not known from a single document. In fact, novelty of the subject-matter of claim 1 was not contested.

3.2 Starting from A1 as closest prior art, A1 discloses (see e.g. Figure 2) a fuel system for a vehicle according to the preamble of claim 1, comprising an inert gas generating system (10a), a fuel tank (last sentence in paragraph [0021]) having a fuel tank vent (paragraph [0022]), a fuel tank valve (50 or 54) and a sequential arrangement of an inlet (12), a heat exchanger (14) and a gas separation module (air separation module ASM 18) for separating gas into a nitrogen-enriched gas flow and an oxygen-enriched gas flow (paragraph [0020]).

A1 also explicitly mentions (paragraph [0020]) that nitrogen-enriched air (NEA) is delivered to the fuel tank ullage, i.e. to the area in the fuel tank which is not filled with fluid fuel, at a stepped or variable flow rate. The expression in paragraph [0022] of A1 "mixing the NEA in the tank ullage", in conjunction with the statement that the embodiments of A1 "rely on existing aircraft vent systems to provide normal tank inward and outward venting", even implies that NEA is directly delivered to the fuel tank ullage. Therefore, a path for delivering NEA to the fuel tank is known. A1 does not disclose a parallel path routed via the fuel tank vent as specified by the first part of the characterising portion of claim 1.

As described in the contested patent, by providing parallel paths for delivering NEA to the fuel tank it is possible to vary the flow rate. However, such variation is already provided for in A1 (Figure 2) in the form of a parallel arrangement of two orifices which are selected by an orifice selector. This leads to the conclusion that the claimed invention seeks to provide an alternative method of distributing the NEA to the fuel tank, as formulated by the respondent.

The person skilled in the art might be tempted to consider the teaching of document A2, which shows alternative ways of delivering an inert gas to an aircraft's fuel tank. However, the board is not convinced that, starting from A1 and taking A2 into consideration, the skilled person would keep the piping system of A1 and implement the piping according to A2 as alleged by the respondent.

Looking at the embodiments described in A2, nitrogen from a source of liquid nitrogen may be injected into the fuel tank either directly via large-capacity pressure control valve 18 (Figure 1; column 1, line 74) and nozzle 28 or, rather than directly, via the vent passage and either valve 114 (Figure 5) or valve 18 (Figure 7). These embodiments also show a parallel path of supplying nitrogen via a spray bar 25 to the fuel tank for scrubbing the liquid fuel during flight of the aircraft (column 2, lines 7 to 11), under the control of a small-capacity solenoid operated scrub valve 19 (column 1, lines 74 to 75), which is operated identically in all the embodiments mentioned above (see column 5, lines 16 to 19; column 6, lines 5 to 7), opening for a preset time triggered by a pressure decrease of 0.5 p.s.i. during climb or due to fuel consumption (see column 3, lines 46 to 64). It is acknowledged that the embodiments of Figures 5 and 7 of A2 show that nitrogen is delivered through the vent and in parallel also directly through the scrubbing arrangement into the fuel tank. In these configurations, supply of a large flow of nitrogen - as required during descent - is only possible via the fuel tank vent. The skilled person might also perceive that the parallel arrangement of valves 114 and 19 (Figure 5) or of valves 18 and 19 (Figure 7) in A2

might correspond to the parallel arrangement of orifices 44 and 46 in A1.

However, the board cannot see that the skilled person would think of complicating the OBIGGS known from A1, which relies "on existing aircraft vent systems to provide normal tank inward and outward venting while mixing the NEA in the tank ullage" (paragraph [0022]), and which proposes a simple control (paragraph [0022]: high purity NEA at low flow during climb and cruise, lower purity NEA at a greater volume during descent), through a complex modification as proposed by A2, i.e. adding the complex scrubbing arrangement and providing a parallel path for delivering NEA through the fuel tank vent. Since A1 contains only the simple teaching that the NEA is directed to the fuel tank ullage (see paragraphs [0020], [0022]), it is already questionable whether the skilled person would even think of deviating from simply supplying NEA directly to the fuel tank ullage and would use, instead or in addition, a supply path via the fuel tank vent. Since A1 already provides for delivering NEA at high and low flow rates, there is simply no motivation for the skilled person to replace the simple solution of A1 with a much more complex arrangement as described in A2 without having any additional benefit.

Even if the skilled person were to do so and implement the piping according to A2, then A2 teaches to provide, in parallel to a supply path via the fuel tank vent, a direct path leading into the fuel tank in the form of the scrubbing arrangement known from A2. However, the board is not convinced that the simple control as described in A1 would still work when supplying NEA instead of pure nitrogen as used in the system of A2. The control of inert conditions in the fuel tank in the

OBIGGS of A1 relies on storing high-purity NEA in the fuel tank during climb and cruise portions of the flight when low flow rates are required, so that during descent when air is forced in through the vents (and when lower purity NEA – due to the limited air separation capacity of the OBIGGS - is provided at higher flow rate) the ullage maintains a nitrogen purity sufficient to maintain the inert condition. As alleged by the respondent, when the air separation module ASM of A1 is operated at low flow rates, the oxygen level of NEA might be sufficiently low (according to A1: about one percent oxygen) to be used in a scrubbing arrangement. However, the bubbles of NEA when reaching the fuel tank ullage will have absorbed oxygen by diffusion (see A2, column 3, lines 58 to 62), i.e. NEA of a lower purity level - although still below an explosive level - reaches the ullage. Thus, the ullage would no longer contain a stock of high-purity NEA, as required according to A1, which could be used during descent requiring a larger flow of low-purity NEA (delivered in parallel to the scrubbing arrangement through the fuel tank vent, when taking into account the teaching of A2) without negative effect, i.e. without compromising a nitrogen purity sufficient to maintain an inert condition. Therefore, the board is not convinced that a system realised by implementing the teaching of A2 (parallel delivery of inert gas to the fuel tank directly via a scrubbing arrangement and in parallel via the fuel tank vent) with the OBIGGS of A1 (which only provides a large flow of low-purity NEA instead of pure nitrogen) would work without further modification and the involvement of an inventive step.

When assessing inventive step, the decisive question is not whether the skilled person could have arrived at the claimed solution of the technical problem to be

solved, but whether he would have done so considering the teaching in the prior art. In the present case, the board is not convinced that the skilled person starting from A1 and using NEA, which still contains a certain level of oxygen, instead of pure nitrogen would have used a piping arrangement which proved to work when supplying pure nitrogen via a dewar as known from A2.

3.3 Also when starting from A2 as closest prior art, the same reasoning applies. A2 shows a dewar containing liquid nitrogen as a source of inert gas, i.e. it does not relate to an OBIGGS comprising a gas separation module. OBIGGS might have been known to the skilled person as a well-established technology, but as argued above, the board is not convinced that the system known from A2 would work when supplying NEA instead of pure nitrogen in the system of A2.

3.4 As a result of the foregoing, the board concludes that the subject-matter of claim 1 according to the current sole request involves an inventive step. Since method claim 18 includes corresponding features, its subject-matter involves an inventive step for the same reasons as claim 1.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to maintain the patent in amended form on the basis of the following:
   - Claims: No. 1-21 of the main request as filed during oral proceedings.
   - Description: Pages 2-9 of the patent as granted.
   - Drawings: Figs. 1-4 of the patent as granted.

The Registrar: The Chairman:

N.Schneider G. Pricolo

Decision electronically authenticated