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**Datasheet for the decision  
of 26 July 2006**

**Case Number:** T 0207/04 - 3.2.01

**Application Number:** 96302424.5

**Publication Number:** 0736453

**IPC:** B64D 47/02

**Language of the proceedings:** EN

**Title of invention:**  
Aircraft lighting system

**Patentee:**  
OXLEY DEVELOPMENTS COMPANY LIMITED

**Opponent:**  
LFD Limited

**Headword:**  
-

**Relevant legal provisions:**  
EPC Art. 100(b)

**Keyword:**  
"Opposition grounds: insufficiency of disclosure (no)"

**Decisions cited:**  
-

**Catchword:**  
-



Case Number: T 0207/04 - 3.2.01

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.01  
of 26 July 2006

**Appellant:** Oxley Developments Company Limited  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 1 December 2003  
revoking European Patent No. 0736453 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

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

## Summary of Facts and Submissions

- I. The appeal is directed against the decision posted 1 December 2003 to revoke European patent No. 0 736 453.
- II. The opposition division found that the patent according to a main and first to fourth auxiliary requests did not disclose the invention as claimed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 100(b) EPC).
- III. The following state of the art played a role during the appeal:

TD1: G. W. Godfrey, "Principles of Display Illumination Techniques for Aerospace Vehicle Crew Stations", 3<sup>rd</sup> edn. Tampa, Aerospace Lighting Institute, 1991, 72 to 117

TD3bis: G. W. Godfrey, "Air Vehicle Exterior Lighting", Tampa, Aerospace Lighting Institute, 1991, ii ('About the author'), iii ('Table of contents'), 3-55

D44: "Lighting, Aircraft, Interior, Night vision Imaging System (NVG) Compatible", US military specification MIL-L-85762A, 26 August 1988

The following evidence also played a role:

1<sup>st</sup> and 2<sup>nd</sup> written statements by Antony Worsdell dated 24 August 2004 and 23 June 2006 respectively.

IV. Oral proceedings were held on 26 July 2006. The appellant requested that the decision under appeal be set aside and the patent maintained in amended form on the basis of the main request or in the alternative on the basis of the first to fourth auxiliary requests on which the contested decision was based. The respondent requested that the appeal be dismissed.

V. The independent claims according to the appellant's main request read as follows:

"1. An external lighting assembly for an aircraft, said assembly comprising a source of visible and infra red light (5;28) and being characterised by a filter (13;15;30) which is at least substantially transparent to visible light and allows visible light from the source to be emitted by the lighting assembly while substantially reducing emission of selected infra red frequencies, thereby preventing or reducing dazzle of night vision systems in use."

"13. A filter unit adapted to be fitted to an external aircraft lighting assembly having a source of visible and infrared light (5,28) disposed within a housing (1) and a housing window (13) through which visible light is emitted, the filter unit being adapted to partition the housing of the aircraft lighting assembly such as to separate the light source within the housing from the housing window and comprising a filter (13, 15, 30) through which light from the source can reach the window, the filter being at least substantially transparent to visible light and being such as to remove or substantially remove selected infra red

frequencies from the radiation emitted by the light source, thereby preventing or reducing dazzle of night vision systems in use."

VI. The opposition division was of the opinion that the "selected frequencies" to be removed from the light source in order to prevent or reduce dazzle of night vision systems were neither derivable from the patent specification nor were known from the common general knowledge of the skilled person.

VII. The arguments of the respondent in respect of the appellant's main request may be summarised as follows:

The patent specification is silent as regards the frequencies to be selected and the skilled person must therefore rely on his common general knowledge. TD1, TD3bis and D44 all contain information regarding the range of wavelengths of light to which night vision imaging systems, commonly night vision goggles (hereafter "NVG"), are sensitive. However, although TD1 and TD3bis are by the same author they specify different ranges. This can only reasonably be understood as being an error in TD3 which therefore, although relating to exterior lighting, cannot be considered as forming the common general knowledge of the skilled person.

Both TD1 and D44 concern cockpit lighting which is NVG compatible since it is viewed directly by the naked eye. By comparison, the present patent relates to exterior, NVG friendly lighting for being viewed through NVGs. This distinction relates to the sensitivity of the NVG to visible light and is not addressed in the patent.

Since TD1 and D44 on the one hand and the patent on the other hand relate to different types of lighting the skilled person would not consider that either TD1 or D44 could be of help in determining the "selected" frequencies. TD1 does specify that NVGs are sensitive to light having a wavelength in the range of 600 to 930 nm. However, there is no indication of how this response may be used in order to arrive at the "selected" frequencies specified in the claims. It is not sufficient for the skilled person to know to which frequencies the NVGs are sensitive since he must also know which frequencies are not to be filtered in order to obtain NVG friendliness. Moreover, D44 discloses that two different classes of NVG exist, responsive to different ranges of frequency.

Even if the response of the NVGs could serve as a basis for selecting the frequencies to be filtered this would not suffice since a further parameter is the output spectrum of the emitted light. An incandescent lamp and a xenon tube, for example, exhibit markedly different spectra.

In summary, neither the patent nor the common general knowledge of the relevant skilled person provides sufficient information for the invention to be put into effect.

VIII. The appellant essentially submitted in respect of its main request that:

The spectral response of NVGs is well known to the skilled person and in TD1 is both shown graphically, as on page 72, and specified as the range 600 to 930 nm.

The distinction between interior and exterior lighting is of no relevance in this respect. The range specified in TD3bis appears to be erroneous. Nevertheless, TD3bis refers the reader to TD1 and the skilled person therefore would be aware of the more detailed treatment of the matter in the latter document. Also the Class 'A' and 'B' filter specifications in D44 and the Gen III response curve presented in the 2<sup>nd</sup> statement by Mr Worsdell are consistent with the information given in TD1; indeed, TD1 refers to D44. The subject-matter of the claims relates to lighting which may be either NVG friendly or, in the case of the provision of an additional infra red (hereafter "ir") transmitter, NVG compatible. As stated by Mr Worsdell, the emission spectrum of the lamp is not critical for NVG compatible lighting but it is anyway well known to the skilled person. The low sensitivity of the NVG and the highly filtered output of the lamp in the overlapping region of the respective spectral ranges for NVG friendly lighting means that the precise cut-off points are not critical.

However, the skilled person would not need to rely on his common general knowledge because he would specify an exterior lighting system for NVG friendliness or compatibility with a particular specification of NVG.

### **Reasons for the Decision**

1. The patent relates to aircraft exterior lighting for use together with night vision imaging systems, commonly NVGs. NVGs are used to see outside of an aircraft during darkness by detecting near-ir light and

converting it into an image visible to the wearer. During covert military operations in darkness aircraft will show only ir lighting which is not visible to the naked eye but which is visible to crew of other craft wearing NVGs. However, it may be required that the aircraft when in civil airspace show visible lighting even during training for covert operations. Conventional lights using filament bulbs exhibit in addition to their emission within the visible spectrum a strong ir component which may dazzle NVGs during covert operation training in civil airspace. The patent aims to solve that problem by the provision of an optical filter to control emission of ir radiation which would interfere with the performance of the NVGs.

- 1.1 The filter provided in accordance with claim 1 is "at least substantially transparent to visible light" and "allows visible light from the source to be emitted by the lighting assembly while substantially reducing emission of selected infra red frequencies, thereby preventing or reducing dazzle of night vision systems in use". The filter according to claim 13 essentially differs only in that it must be such as to "remove or substantially remove" the selected ir frequencies, rather than substantially reduce their emission. This difference is of no consequence to the matter of sufficiency of disclosure and neither party has submitted otherwise.
  
- 1.2 There exist two categories of aircraft lighting for use with NVGs. A first category is "NVG compatible" lighting which is not intended to be visible through an NVG. Interior (instrument) lighting is "compatible" in order to avoid interference with the view through the



NVG and the instruments are viewed directly without the aid of the NVG. The second category is "NVG friendly" exterior lighting which emits a component of the spectrum to which NVGs are sensitive in order that the light may be viewed through them.

1.3 There exist two classes of NVG, Class 'A' and Class 'B' which differ in their spectral response to wavelengths below 670 nm.

2. The matter of sufficiency of disclosure in this case centres around the question of whether the skilled person has sufficient information to be able to put into effect the subject-matter of claims 1 and 13 without undue burden. Two sources of information are available to him. The first is the content of the patent specification itself and the second is the common general knowledge of the skilled person. The skilled person here would be a notional team comprising at least a person skilled in exterior lighting for aircraft and a person skilled in night vision systems.

2.1 Column 4, lines 42 to 46 of the patent specification states that "the filter elements ... while at least substantially transparent to visible light are at least substantially opaque to the IR wavelengths detected by NVGs". From this the skilled person learns that the "selected" ir frequencies are those to which the NVG is sensitive. Even without standardisation of NVGs the skilled person would be able to obtain the spectral response of an NVG from its manufacturer and specify the filter accordingly.

2.2 However, in practice NVGs are used primarily in military aircraft and there exist specifications which belong to the skilled person's common general knowledge. TD3bis concerns exterior illumination for aircraft and therefore forms a highly relevant source of information for the skilled person in the present case. TD3bis refers the reader to TD1 "for a complete understanding of the theory and application" of NVGs and their application to air vehicles. TD1 was published in the same year and written by the same author as TD3bis but concerns aircraft exterior illumination for use with NVGs. TD1 repeatedly refers to D44 which is a military specification relating to interior lighting for use with NVGs.

2.2.1 The content of TD3bis page 3-55 relates to NVG compatible exterior lights for use with NVGs and states that NVGs "presently in use by the United States Military have a sensitivity in the 800 to 900 nanometer spectral region". However, in view of the reference in TD3bis to TD1 it is clear that the skilled person when wishing to adapt aircraft exterior lighting for use with NVGs would not rely on the content of TD3bis alone but would also consult TD1. TD1 states in several places that NVGs are "highly responsive" in the 600 to 930 nm range and supports this with graphs. TD1 refers in turn to D44 which details the relative spectral response of Class 'A' and Class 'B' NVGs over the range 450 to 930 nm wavelength at 5 nm intervals (pages 37, 38). It is without consequence that TD1 and D44 primarily concern interior lighting because the latter is cross-referenced from TD1 to which the reader of TD3bis has been referred and it is their content as

regards the response of NVGs which the skilled person would seek out.

- 2.2.2 In the board's view TD1 and TD3bis are not contradictory since the narrower range mentioned in the latter falls within the broader range specified in the former. However, the terms "sensitivity" and "highly responsive" in TD3bis and TD1 respectively and even the graphical representations in TD1 are imprecise in comparison with the detailed disclosure of D44 pages 37, 38. The skilled person seeking to specify a filter for use with an NVG and initially turning to the disclosure of TD3bis would be led by the cross-references to D44 and would immediately appreciate its content as being the best information available.
- 2.2.3 The skilled person therefore knows from the combination of the patent specification and his common general knowledge that the "selected" ir frequencies are those corresponding to the wavelengths extending from the limit of visible light to the limit of the response of the NVG as disclosed in D44.
- 2.3 The above considerations relate to the provision of NVG compatible lighting. However, claims 1 and 13 do not exclude NVG friendliness in as far as they specify merely that the reduction of ir emission or removal of ir frequencies be substantial. Similarly, the patent specification column 4, lines 42 to 46 states that the filter is "at least substantially" opaque to the ir wavelengths detected by NVGs. Sufficiency within this range therefore must also be considered.

2.3.1 None of TD1, TD3bis and D44 addresses the matter of NVG friendliness. Mr Worsdell in his 2<sup>nd</sup> statement indicates that the degree of "friendliness" is determined by the overlap between the spectral response of the NVG and the spectral output of the filtered light. Furthermore, Mr Worsdell states that the matter has been addressed in a military standard only after the priority date and that formerly the desired degree of "friendliness" was not obvious and would have been determined by trial and error testing. However, the present claims do not require any particular degree of "friendliness". As stated by Mr Worsdell in his 1<sup>st</sup> statement the determination of the degree of "friendliness" would be a function also of the spectral output of the light source itself. This information would be known from the manufacturer of the light source to be filtered. Even if some testing were to be necessary there would be no need for inventive activity on the part of the skilled person when putting the claimed subject-matter into effect since it would involve no more than the simple measurement of known parameters.

3. On the basis of the foregoing the board considers that the skilled person putting into effect the subject-matter of claims 1 and 13 according to the main request would encounter no difficulties which would require inventive activity or otherwise would impose an undue burden. The opposition ground according to Article 100(b) EPC therefore does not prejudice maintenance of the patent on the basis of these claims.

4. The opposition was filed on the basis of the grounds of lack of novelty and lack of inventive step in addition to insufficiency of disclosure. Since the opposition

division considered only the last ground the board exercises its discretion in accordance with Article 111(1) EPC to remit the case for further prosecution.

## **Order**

### **For these reasons it is decided that:**

1. The decision under appeal is set aside.
2. The case is remitted to the first instance for further prosecution.

The Registrar:

The Chairman:

A. Vottner

S. Crane