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**Datasheet for the decision  
of 13 March 2018**

**Case Number:** T 1076/15 - 3.2.03

**Application Number:** 06110676.1

**Publication Number:** 1698823

**IPC:** F21S8/00, F21V7/04, F21W111/00,  
F21Y101/02

**Language of the proceedings:** EN

**Title of invention:**  
Beacon light with reflector and light emitting diodes

**Patent Proprietor:**  
DIALIGHT CORPORATION

**Opponent:**  
Orga Suisse S.A.R.L.

**Headword:**

**Relevant legal provisions:**  
EPC Art. 100(a), 54, 56, 111(1)  
RPBA Art. 12(4), 13(1)

**Keyword:**

Late-filed request - admitted (yes)

Amendments - allowable (yes)

Late-filed document - admitted (yes)

Remittal to the department of first instance - (no)

Novelty - (yes)

Inventive step - (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

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Case Number: T 1076/15 - 3.2.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.03**  
**of 13 March 2018**

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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
17 March 2015 concerning maintenance of the  
European Patent No. 1698823 in amended form.**

**Composition of the Board:**

**Chairman** G. Ashley  
**Members:** V. Bouyssy  
J. Geschwind

## **Summary of Facts and Submissions**

- I. European patent No. 1 698 823 (in the following: "the patent") relates to a light-emitting diode (LED) reflector optic, and more particularly to a LED-based beacon light, typically used for marking tall buildings and towers to assist aircraft navigation.
- II. The patent as a whole was opposed on the grounds of unallowable extension of the content of the application as filed (Article 100(c) EPC), insufficient disclosure (Article 100(b) EPC), lack of novelty and lack of inventive step (Article 100(a) EPC).
- III. At oral proceedings on 10 December 2012, the opposition division decided to revoke the patent because the amended claims of the main and auxiliary requests before it did not comply with Article 123(2) EPC.
- IV. This decision was appealed by the patent proprietor.
- V. In decision T 441/13 of 19 February 2014, Technical Board 3.2.03 (in another composition) set aside the decision under appeal and remitted the case to the opposition division for further prosecution on the basis of the claims of auxiliary request zero before it, in particular for consideration of the objections under Articles 100(b) and 100(a) EPC.
- VI. At oral proceedings on 26 February 2015, the opposition division decided that the ground for opposition of lack of inventive step prejudiced the maintenance of the patent as amended according to auxiliary request zero (then main request), but that the patent as amended on the basis of the first auxiliary request before it met the requirements of the EPC.

- VII. This intermediate decision was appealed by both the patent proprietor and the opponent.
- VIII. As both parties are thus appellant and respondent, for the sake of simplicity they are referred to as patent proprietor and opponent.
- IX. With the summons to oral proceedings, the Board sent a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA) indicating its preliminary opinion of the case.
- X. Oral proceedings before the Board were held on 13 March 2018.
- XI. Final requests

The patent proprietor requested that the appealed decision be set aside and the patent be maintained as amended on the basis of the main request or the first to nineteenth auxiliary requests, as filed with letter of 7 March 2018.

The opponent requested that the appealed decision be set aside and the patent be revoked in its entirety.

- XII. Claims of the patent proprietor's main request

Independent apparatus claim 1 as amended is directed to the following subject-matter (compared with claim 1 as granted, added passages are indicated in bold, deleted passages in strike-through):

A light-emitting diode (LED) reflector optic (24), comprising:

- a **segmented** reflector (28) having a plurality of reflecting surfaces (32), wherein each one of said plurality of reflecting surfaces (32) is associated with at least one optical axis (36), each reflecting surface (32) comprising a linearly projected cross-section (40) along a respective linear extrusion axis (44), wherein the linearly projected cross-section (40) of each reflecting surface (32) comprises at least one of: a conic or a substantially conic shape; and
- a plurality of LEDs (52), characterised in that each one of the plurality of LEDs is positioned in a line parallel to said linearly projected cross-section (40) of an associated one of said of reflecting surfaces (32) ~~relative to an associated reflecting surface (32) of said plurality of reflecting surfaces (32)~~, such that a central light-emitting axis (56) of each one of the plurality of LEDs (52) is angled relative to the at least one optical axis (36) of said associated reflecting surface (32) of the plurality of reflecting surfaces (32) at about 90° and such that each of the reflecting surfaces (32) redirects and collimates a light output of a respective each one of the plurality of LEDs (52) at an angle of about 90° with respect to the central light emitting axis (56) of each one of the plurality of LEDs (52), wherein each one of the plurality of reflecting surfaces (32) receives light from each one of its associated LEDs (52) from a **the** focal distance of said associated one of said plurality of ~~reflective~~ **reflecting** surfaces (32).

Independent method claim 14 as amended is directed to the following subject-matter:

A method, comprising:

- arranging a plurality of reflecting surfaces (32) relative to each other, each of the plurality reflecting surfaces (32) comprising a linearly projected cross-section (40) along a respective linear extrusion axis (44), wherein the linearly projected cross-section (40) of each reflecting surface (32) of said plurality of reflecting surfaces (32) comprises at least one of: a conic or a substantially conic shape; and

characterised by:

- positioning each one of a plurality of LEDs (52) in a line parallel to said linearly projected cross-section (40) of an associated one of the plurality of reflecting surfaces (32), wherein the positioning step angles a central light-emitting axis (56) of each one of the plurality of LEDs (52) relative to at least one optical axis (36) associated with the plurality of reflecting surfaces (32) at about 90° such that each of the reflecting surfaces (32) redirects and collimates a light output of a respective each one of the plurality of LEDs (52) at an angle of about 90° with respect to the central light emitting axis (56) of each one of the plurality of LEDs (52), wherein each one of the plurality of reflecting surfaces (32) receives light from each one of ~~the~~ **plurality of its associated** LEDs (52) from a **the** focal distance of said associated one of said plurality of reflecting surfaces (32); and
- transmitting the light from the plurality of LEDs (52) onto the associated one of the plurality of reflecting surfaces (32).

Independent apparatus claim 17 as amended is directed to the following subject-matter:

A reflector optic (24), comprising:

- a plurality of reflecting means **surfaces** (32) for reflecting light in the direction of at least one optical axis (36), each reflecting means **surface** (32) comprising a means for receiving light along a linearly projected cross-section (40) along a respective linear extrusion axis (44), wherein the linearly projected cross-section (40) of each reflecting means **surface** (32) of said plurality of reflecting means **surfaces** (32) comprises at least one of: a conic or a substantially conic shape; and
- a plurality of light emitting means (52) for emitting a hemisphere of light,

characterised in that

- each one of the plurality of light emitting means (52) is positioned in a line parallel to said linearly projected cross-section (40) of an associated one of said plurality of ~~reflective~~ **reflecting** surfaces (32) such that a central light-emitting axis (56) of each one of the plurality of light emitting means (52) is angled relative to at least one optical axis (36) at about 90° and such that each of the plurality of reflecting means **surfaces** (32) redirects and collimates a light output of a respective each one of the plurality of light emitting means (52) at an angle of about 90° with respect to the central light emitting axis (56) of each one of the plurality of light emitting means (52), wherein each one of the plurality of ~~reflective~~ **reflecting** surfaces (32) receives light from each one of ~~the plurality of~~ **its associated** light emitting means (52) from ~~a~~ **the** focal distance of said associated one of said plurality of ~~reflective~~ **reflecting** surfaces (32).



XIII. Cited evidence

In their statements setting out the grounds of appeal, the parties referred to the following documents, which were filed in the opposition proceedings and are cited in the decision under appeal:

- D1: Datasheet "Dialight Class 1, Div 2 D164 Series LED based", Dialight Ltd. and Dialight Corp., No. MDTF864X002\_B, "Preliminary - New for 2005", 2 pages
- D1a: Enlarged version of the image on page 1 of D1
- D2: Print screen of Orga's file server
- D4: Print screens of Dialight's website archived in Internet Archive Wayback Machine on 26 October 2005, 26 November 2005, 10 December 2005 and 12 December 2005
- D5: Print screen of Dialight's website archived on 26 October 2005 showing datasheet file name
- D6: Copy of e-mail dated 5 October 2005 showing URL of Dialight's datasheet
- D7: Print screen of Dialight's website archived on 26 October 2005 showing URL with archive date of beacon image
- F1: Datasheet of obstruction light AOL1000SA
- F2: Drawing of obstruction light AOL1000, Orga
- F3: Photograph of obstruction light AOL1000
- F4: Orga, condensed catalogue, front page, index, page 18, rear page with imprint "0998"
- F5a: Invoice for obstruction lights AOL1000, Orga Suisse S.A.R.L., dated 16 July 2002
- F6: Declaration of Mr. Peter Goedknecht, dated 23 January 2015
- G1: US 5,155,666
- H1: US 2005/0094393 A1

In addition, the opponent has relied on the following documents filed with the grounds of appeal:

D1b: Datasheet "Dialight Hazardous Location D164 Series LED based", Dialight Ltd. and Dialight Corp., No. MDTF864X002\_O, 2 pages

J1: US 5,642,933

In support of its allegation that the obstruction light AOL1000 shown in F1 to F4 was publicly available before 15 December 2005, the opponent has offered to hear Mr Goedknecht as witness.

XIV. The arguments of the parties, insofar as relevant for the present decision, can be summarised as follows:

(a) Main request - Admissibility

The opponent requested that the main request be held inadmissible because it had been filed too late, at an extremely late stage of the proceedings, because the feature which had been added to claim 1 amounted to an unallowable intermediate generalisation of the teaching in the application as filed that the reflector is preferably a segmented reflector whose adjacent reflecting surfaces are interconnected without any gap (page 4, lines 30 and 31 in combination with figure 2), and because claim 1 as amended still lacked novelty in light of D1 and still lacked an inventive step in view of H1, G1 and J1.

The patent proprietor argued that the main request was filed in direct reaction to the Board's preliminary opinion in its communication under Article 15(1) RPBA that, in the context of claim 1, the term "reflector" claim 1 should be construed in a broad manner. The

feature added to claim 1 made clear that - as repeatedly submitted throughout the opposition and appeal proceedings - the reflector was a segmented reflector. This amendment was based on the teaching in the application as originally filed, on page 4, lines 30 and 31 and page 7, lines 32 and 33.

(b) Consideration of D1b and J1 in the proceedings

The patent proprietor requested the Board not to admit documents D1b and J1 into the proceedings because they were filed too late and they lacked relevance. If J1 was to be admitted, the case should be remitted to the opposition division.

The opponent explained that D1b was submitted in reaction to the opposition division's decision that the image on page 1 of D1 failed to disclose most of the technical features of claim 1, while J1 was submitted in reaction to the opposition division's narrow interpretation of the term "reflector" that first became apparent in the oral proceedings on 26 February 2015.

(c) Prior use AOL1000

The opponent submitted that, contrary to the opposition division's view, the obstruction light AOL100 shown in documents F1 to F4 was publically available before the effective priority date of the patent, namely 15 December 2005. In this respect, the opposition division attributed too much weight to inconsistencies with respect to the product name in documents F1, F2, F3, F4 and F5a and too little weight to the written declaration F6 of Mr Goedknecht.

The patent proprietor argued that the opponent had failed to prove its own prior use beyond reasonable doubt.

(d) Public prior availability of D1

The patent proprietor submitted that the opponent had failed to prove that D1 was part of the state of the art prior to 15 December 2005. Contrary to the opposition division's view, the mere fact that D1 comprised the text "Preliminary - New for 2005" did not imply that it was indeed made publicly available long before 15 December 2005.

The opponent submitted that, in the light of D2, D4, D5, D6 and D7, it should be concluded that, on the basis of a balance of probabilities, D1 was available to the public before 15 December 2005.

(e) Main request - Novelty

Opponent's case:

The opposition division erred in deciding that D1 failed to disclose all the features of claim 1. It follows from the text on page 1 of D1 and the photometric data on page 2 that the beacon light disclosed in D1 meets the FAA L864 specification for obstruction lights. For a skilled reader of D1 it is readily apparent that this beacon light comprises all technical features recited in claim 1. In particular, in the image showing the physical layout of the beacon light on page 1 of D1, the skilled person recognises three reflecting surfaces with a parabolic cross-section as well as a row of seven LEDs positioned in front of each one of the reflecting surfaces. This

understanding is confirmed by the enlarged image in D1a and the clearer image on page 1 of D1b. Finally, in view of the photometric test results on page 2 of D1, the skilled person understands that the LEDs and the reflecting surfaces must be arranged in the claimed manner.

Patent proprietor's case:

As ruled by the opposition division, it cannot be derived from the low-resolution image on page 1 of D1 how the reflecting surfaces are shaped and how the LEDs are arranged. The image is blurred and the skilled person can at most recognise squiggles and darkened areas.

(f) Main request - Inventive step

Patent proprietor's case:

The opposition division erred in deciding that, starting from H1, the subject-matter of claims 14 and 17 was rendered obvious by the teaching of G1.

Firstly, H1 does not form a realistic starting point for assessing inventive step because it is unrelated to the technical problem and the technical field of the patent. Indeed, the patent is concerned with the improvement of beacon lights to assist aircraft navigation, while H1 deals with warning lights of emergency vehicles such as ambulances and fire trucks (paragraphs 45 and 52).

Secondly, even if the skilled person were to start from H1, he would have no motivation for modifying the light assembly shown in figure 5 to increase the angular

spread of the light distribution. In fact, the wide light beam shown in figure 6 already meets the photometric requirements for emergency warning lights of ambulances and fire trucks.

Thirdly, even if the skilled person were seeking to further increase the angular spread of the light distribution, he would consider curving the reflecting surface in the horizontal plane and arranging the LEDs in a curved manner along the reflecting surface, in a manner similar to that shown in figure 17 of the patent. In so doing he would not arrive at the claimed solution. The skilled person would not consider the teachings of G1 and J1 because these documents respectively concern aircraft obstruction lights and warning lights for robots, production lines or parking lots, which must meet other photometric requirements than the emergency vehicle warning lights disclosed in H1. Even if the skilled person were to consider the arrangement shown in figure 11 of J1, he would inevitably position a single LED in front of a flat reflecting surface arranged in a stepwise manner. This is not the claimed solution.

For assessing inventive step, G1 is the most promising and relevant starting point. The subject-matter of claim 14 differs from it in that each linear light source comprises a plurality of LEDs positioned in a line parallel to the linearly projected cross-section of the associated reflecting surface. This modification solves the problem of improving the beacon light in terms of size, weight, energy consumption and light pollution (see paragraphs 2 and 39 of the patent specification). This modification is not rendered obvious by the teaching of H1. In fact, the skilled person would not consider this document because it

belongs to the remote field of emergency vehicle warning lights and it does not address the problem to be solved. Instead, H1 aims to improve the efficiency of light collection in LED-based reflectors (see paragraphs 4 and 5).

Opponent's case:

H1 discloses, in figure 5, a light assembly 40 including an array of LEDs 44 positioned in front of a linear reflector 42 having a reflecting surface 46 with a parabolic cross-section 60. The subject-matter of claim 14 differs from H1 by the step of using a plurality of such light assemblies. The technical problem objectively solved by this distinguishing feature is how to emit light in a plurality of directions. The skilled person faced with this problem would apply the optical teaching of G1 (figure 4) or that of J1 (figure 11), which is to arrange a plurality of reflectors in a polygonal fashion to emit light over a 360° angular distribution about a central axis. It is irrelevant whether H1, G1 and J1 concern different types of reflector optics, since the broad wording of claim 1 is not limited to any specific reflector optic. In conclusion, the subject-matter of claim 1 lacks an inventive step when starting from H1.

The same conclusion would be reached if the skilled person were to start from G1, instead of H1. Claim 14 differs from G1 in that each xenon-filled flash tube (14, 16, 18) is replaced by a plurality of LEDs positioned in a line parallel to the axis (38) of the associated reflecting surface (34). The technical problem objectively solved by this distinguishing feature is how to improve the efficiency of the beacon light. The claimed solution to this problem is rendered

obvious by the teaching of H1, in particular figure 5 of H1 which discloses nine LEDs positioned in a line parallel to the axis 100 of the reflecting surface 46. H1 addresses the technical problem since it is stated in paragraph 5 of H1 that the reflector design disclosed therein improves efficiency. Again, it is irrelevant that G1 and H1 concern different types of reflector optics, because the broad language of claim 14 is not limited to any specific reflector optic.

### **Reasons for the Decision**

1. Main request - Admissibility
  - 1.1 The patent proprietor filed the current main request after oral proceedings had been arranged, allegedly in reaction to the Board's communication under Article 15(1) RPBA in preparation of the oral proceedings.
  - 1.2 Although the request was filed very late, and the communication had not raised any new issues, the Board exercised its discretion to admit this request into the proceedings for the following reasons (Article 13(1) RPBA):
    - 1.3 Claim 1 of the current main request differs from claim 1 of the main request filed with the appeal grounds of the patent proprietor by the added limitation that the reflector of the reflector optic is a "segmented reflector".
    - 1.4 This amendment did not give rise to any issues that had not already been discussed. Throughout the opposition and appeal proceedings, the patent proprietor consistently argued that this limitation was at least implicitly present in claim 1. It was also noted that,



in the appeal proceedings, the opponent had already made written submissions directed at the subject-matter of claim 1, should the Board share the patent proprietor's view that, in the context of claim 1, the term "reflector" means "segmented reflector". In summary, the amendment did not compromise the procedural economy.

2. Main request - Amendment

2.1 In T 441/13, the Board decided that the amended claims filed as auxiliary request zero during the oral proceedings on 19 February 2014 met the requirements of Articles 123 and 84 EPC.

2.2 Claim 1 of the current main request differs from claim 1 of auxiliary request zero by the added limitation that the reflector of the reflector optic is a "segmented reflector".

2.3 This amendment is supported by the teaching on page 4, lines 30 and 31 and page 7, lines 32 and 33 of the application as originally filed.

2.4 In conclusion, the amendment to claim 1 meets the requirements of Article 123(2) and (3) EPC.

2.5 The amendment does not introduce non-compliance with Article 84 EPC.

3. Relevant date

3.1 The patent claims priority from two US applications, namely US11/069,989 filed on 3 March 2005 and US11/300,770 filed on 15 December 2005.

- 3.2 It is common ground that the claimed subject-matter is entitled to the second priority date, but not to the first priority date.
- 3.3 Thus, the relevant date for assessing novelty and inventive step of the claimed invention is 15 December 2005.
4. Consideration of D1b and J1 in the proceedings
- 4.1 The opponent has filed D1b and J1 in direct reaction to the findings in the appealed decision that, apart from a plurality of LEDs, D1 fails to disclose the specific features of the claimed invention (point 2.4 of the reasons) and that, in the context of the patent, the term "reflector" must be construed as meaning a single reflector (point 2.6 of the reasons). These documents do not raise new issues of particular complexity, but rather reinforce the attacks of lack of novelty in light of D1 and of lack of inventive step when starting from H1, which were already presented before the opposition division.
- 4.2 The patent proprietor has not indicated, and the Board cannot find, any convincing reason why these pieces of evidence should be disregarded. During the first appeal proceedings, the questions of novelty and inventive step were not discussed (Article 12(4) RPBA). The mere fact that the interpretation of the term "reflector" was already presented by the patent proprietor in its submission dated 26 January 2015 (page 5, paragraph 2), i.e. one month in advance of the oral proceedings, and adopted by the opposition division in the oral proceedings does not imply that document J1 should have been filed in the opposition proceedings.

- 4.3 Hence, the Board decided to take D1b and J1 into consideration, notwithstanding their relevance.
5. Remittal of the case
- 5.1 The patent proprietor's had requested that the case be remitted to the opposition division in the event that the Board intended to admit J1 into the proceedings.
- 5.2 In view of the fact that the evaluation of J1 was straightforward and could be dealt with within the framework of the proceedings, and taking into consideration the need for procedural efficiency, the Board considered that it was not appropriate to remit the case but decided instead to deal with it itself (Article 111(1) EPC).
6. Prior use AOL1000
- 6.1 The opponent challenged the decision of the opposition division that the alleged public prior use of an obstruction light named "AOL1000" was not sufficiently proven.
- 6.2 In its communication pursuant to Article 15(1) RPBA the Board addressed this question as follows (point 10 of the communication):
- "10.1 ... In this respect, since all evidence in support of the alleged prior use lies within the power and knowledge of the opponent, it is incumbent upon it to prove the alleged prior use to the higher standard of "beyond reasonable doubt".*
- 10.2 Should the documents annexed to the opponent's statement of grounds of appeal and originating in*

*opposition proceedings be considered as "incorporating by reference" the respective arguments, the Board's preliminary view would side the position reached by the opposition division, namely that the evidence is scarcely sufficient to establish a credible offers-and sales chain and thus to instigate a need for further investigation of the matter, in particular for the hearing the proposed witness".*

6.3 In response, the opponent neither commented upon nor disputed this opinion, and the Board sees no reason to depart from it. Hence, the Board decided not to investigate this alleged public prior use any further.

7. Public prior availability of D1

7.1 D1 is an advertising datasheet from Dialight Ltd. and Dialight Corp., i.e. from the patent proprietor.

7.2 The patent proprietor contested the public availability of D1 prior to the priority date of the patent (15 December 2005).

7.3 However, the Board shares the patent proprietor's view that, even if D1 formed part of the state of the art in accordance with Article 54(2) EPC, its teaching would not anticipate the subject-matter of claim 1 (see point 8 hereafter). In light of this conclusion, there is no need to investigate any further the question of the public availability of D1. It has to be noted that D1 has been used to challenge the novelty of the claimed subject-matter, but not inventive step.

8. Main request - Novelty

- 8.1 D1 discloses a LED-based beacon light designed and constructed to meet the Federal Aviation Administration (FAA) specification for obstruction lighting equipment in the United States, namely FAA Advisory Circular (AC) No. 150/5345-43E (see page 1 of D1). Within this specification, there exists requirements for a medium-intensity flashing red obstruction light unit, designated "L-864", as mentioned in D1 (see page 1, "Medium Intensity Red Beacon FAA Type L864"). The FAA specification requires that the L-864 light unit be capable of generating a 360° light beam in a horizontal plane while also meeting peak photometric light intensity and beam spread dimensions for both the horizontal and vertical planes (see e.g. G1, column 1, lines 13 to 23), namely a peak effective intensity of 2,000 ± 25% candela throughout the omnidirectional 360°, and a minimum effective intensity of 750 candela throughout a minimum vertical beam spread of 3°. The photometric test results shown on page 2 of D1 demonstrate that the beacon light as disclosed in D1 produces the required photometrics.
- 8.2 The parties dispute whether or not D1 discloses the features of claim 1.
- 8.3 The Board shares the opponent's view insofar that, in view of the title and the image on page 1 of D1 and of the photometric data on page 2 of D1, it is apparent that the beacon light disclosed in D1 forms a LED reflector optic in the sense of claim 1 and that it comprises a plurality of LEDs and a segmented reflector having a plurality of reflecting surfaces. However, it cannot be derived from D1 how the reflecting surfaces are shaped and how the LEDs are arranged and oriented relative to the reflecting surfaces. Contrary to the opponent's view, this information cannot be derived

from the low-resolution image on page 1 of D1. In fact, this image is so blurred than one can hardly derive any technical details from it. Further, documents D1a and D1b cannot complement the information of D1. D1a is an enlarged view of the image on page 1 of D1. D1b is an advertising datasheet from Dialight Ltd. As noted by the patent proprietor, D1b refers to patent US 7,281,821, which was published on 16 October 2007, and thus D1b cannot have come into existence earlier than October 2007, i.e. after the priority date of the patent. Finally, no evidence has been provided to support the opponent's assertion that all features of claim 1 must inevitably be present in order to achieve the photometric data shown on page 2 of D1.

8.4 Thus, D1 fails to disclose at least the cross-sectional shape of the reflecting surfaces and the arrangement of LEDs as required in claim 1.

8.5 Therefore, the subject-matter of claim 1 is novel in light of D1.

9. Main request - Inventive step

9.1 G1 forms a realistic starting point for the assessment of inventive step, because it is concerned with beacon lights for guiding aircraft (column 1, lines 7 to 23 and figure 11) and the patent aims to improve aircraft obstruction beacon lights (paragraphs 2 and 39 of the patent specification).

9.2 G1 discloses a method of building and using a beacon light (10), comprising, in the terms of claim 14, the steps of:

- arranging a plurality of reflecting surfaces (reflectors 28, 30, 32 in figure 4) relative to

each other, each reflecting surface comprising a linearly projected cross-section along a respective linear extrusion axis, wherein the linearly projected cross-section has a conic or substantially conic shape, namely a parabolic or pseudo-parabolic shape (column 6, lines 45 and 46); and

- positioning each one of a plurality of linear light sources (14, 16, 18 in figure 4) parallel to said linearly projected cross-section of an associated one of the plurality of reflecting surfaces, wherein the positioning step angles a central light-emitting axis of each one of the plurality of light sources relative to at least one optical axis associated with the plurality of reflecting surfaces at about  $90^\circ$  such that each of the reflecting surfaces redirects and collimates a light output of a respective each one of the plurality of light sources at an angle of about  $90^\circ$  with respect to the central light emitting axis of each one of the plurality of light sources, wherein each one of the plurality of reflecting surfaces receives light from each one of its associated light sources from the focal distance of said associated one of said plurality of reflecting surfaces; and
- transmitting the light from the plurality of light sources onto the associated one of the plurality of reflecting surfaces (see figures 7, 10 and 11).

9.3 G1 teaches that each of the linear light sources preferably comprises a cylindrical flash tube, filled with xenon or some other gas which generates light when charged (column 4, lines 60 to 64).

- 9.4 It is agreed that the subject-matter of claim 14 differs from G1 in that each of the linear light sources comprises a plurality of LEDs positioned in a line parallel to the linearly projected cross-section of the associated reflecting surface.
- 9.5 Thanks to this distinguishing feature, the claimed method results in a smaller and lighter beacon light with reduced energy consumption and less light pollution, i.e. emission of light outside the specified planes (see paragraphs 2 and 39 of the patent specification). Thus, starting from G1, the problem objectively solved by the distinguishing feature can be seen as how to improve the beacon light in terms of size, weight, energy consumption and light pollution.
- 9.6 The Board is not persuaded by the opponent's argument that the skilled person, in the expectation of solving the objective problem, could and indeed would modify the beacon light of G1 in view of the teaching of H1 so as to arrive at the claimed invention.
- 9.7 Even though H1 is generally concerned with reflector optics, it does not address the problem to be solved. Instead, H1 aims to improve the efficiency of light collection in LED-based reflectors (paragraphs 4 and 5 of H1), which preferably meet the standard specifications for emergency warning lights of ambulances and fire trucks (paragraphs 45 and 52). For such emergency warning lights, the photometric requirements significantly differ from those for aircraft obstruction lights as disclosed in G1 (column 1, lines 13 to 23). In particular, they produce a much narrower light beam in the horizontal plane, as illustrated in figures 6, 8, 10 and 15 of H1.



- 9.8 The opponent submitted that it is irrelevant that G1 and H1 concern different types of reflector optics because the broad wording of claim 14 is not limited to any specific reflector optic. However, when answering the "could/would" question, the wording of the claim has to be left aside in order to avoid any hindsight bias.
- 9.9 In conclusion, the Board is not convinced that the subject-matter of claim 14 lacks an inventive step when starting from G1.
- 9.10 The opponent also argued that the subject-matter of claim 14 is not inventive when taking H1 as starting point. The Board is not persuaded by this argument, for the reasons submitted by the patent proprietor.
- 9.11 H1 discloses, in figure 5, a light assembly 40 which includes a reflector 42 and an LED array 44. It comprises, in the terms of claim 14 of the patent: a single reflecting surface 46 comprising a linearly projected cross-section 60 with a parabolic shape; nine LEDs 30 positioned in a line parallel to the axis of the reflecting surface, wherein the light-emitting axis 82 of each LED is perpendicular to the optical axis 70 of the reflecting surface such that the surface 46 redirects and collimates a light output of each LED at an angle of about 90° with respect to the light emitting axis 82, wherein the surface 46 receives light from each LED from the focal distance of the surface. The subject-matter of claim 14 differs from H1 by the steps of arranging a plurality of the LED-based reflectors relative to each other.
- 9.12 Whilst H1 has many technical features in common with claim 14, it is not a realistic starting point for

assessing inventive step because it is unrelated to the technical problem addressed in the patent, namely how to improve aircraft obstruction beacon lights in terms of size, weight, energy consumption and light pollution (see paragraphs 2 and 39 of the patent specification). Instead, H1 aims to improve the efficiency of light collection in warning lights for emergency vehicles such as ambulances and fire trucks (see point 9.7 above).

9.13 Notwithstanding the above, the technical problem proposed by the opponent, namely how to modify the light assembly shown in figure 5 of H1 to enable emission of light in a plurality of directions, is an artificial problem which is unrelated to the actual disclosure of H1. In particular, the light assembly shown in figure 5 of H1 is already capable of generating a 120° light beam in a horizontal plane, as shown in figure 6.

9.14 Finally, even if the skilled person wished to produce a wider light distribution pattern than that shown in figure 6 of H1, the Board is not convinced that the distinguishing feature would be an obvious modification.

9.14.1 Based on common general knowledge, the skilled person would consider modifying the shape of the reflecting surface 46 or the LED array 42 disclosed in figure 5 of H1. In doing so he would not arrive at the claimed solution.

9.14.2 The mere fact that G1 is generally concerned with a reflector optic would not prompt the skilled person to consider its teaching and apply it to the light assembly disclosed in figure 5 of H1. As reasoned

above, in view of the different photometric requirements mentioned in H1 (paragraphs 45 and 52) and G1 (column 1, lines 13 to 23), the skilled person would rather disregard the teaching of G1. Whilst claim 14 is silent with respect to the intended use of the reflector optic as defined therein, the wording of the claim cannot provide any motivation for the skilled person to consider G1 (see point 9.8 above).

9.14.3 J1 concerns LED warning lights which are installed in, for example, a parking lot or a work place, on automatic machines, on robots or in production lines (column 1, lines 6 to 19). J1 aims at reducing the number of LEDs while improving visibility and appearance and teaches that this is achieved by positioning a plurality of LEDs in a circular or polygonal fashion and arranging the associated reflecting surfaces in a stepwise fashion, whereby the reflected light is transmitted through a diffusion filter that covers the circumference of the light (see claims 1 and 2; column 2, lines 30 to column 3, line 3; figures 3 and 11). The Board can see no reason why the skilled person would consider this teaching. Moreover, even if he were to consult figure 11 of J1, as suggested by the opponent, he would inevitably consider using flat reflecting surfaces and positioning a single LED before each reflecting surface as shown in figure 11, instead of using conical reflecting surfaces and positioning a line of LEDs before each reflecting surface, as required in claim 1. Indeed, J1 insists that, for warning lights producing a wide light beam, the reflecting surfaces should be formed of flat surfaces to improve visibility (column 4, lines 26 to 37).

- 9.15 The above reasoning applies *mutatis mutandis* to the subject-matter of independent apparatus claim 1 as well as that of independent apparatus claim 17. Claim 1 concerns a LED reflector optic, whereby all features of the reflector optic as defined in claim 1 inevitably result from the method as defined in claim 14. Claim 17 concerns a reflector optic that corresponds to the reflector as defined in claim 1, with the only difference that, in place of LEDs, it comprises a plurality of light emitting means for emitting a hemisphere of light.
10. For the reasons set out above, neither the grounds for opposition raised by the opponent nor the objection raised by the opponent under Article 123(2) EPC prejudice the maintenance of the patent as amended according to the main request.
11. In light of this conclusion there is no need to consider the auxiliary requests of the patent proprietor.
12. The description is in conformity with the amended claims. This was not disputed by the opponent.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent as amended in the following version:
  - claims 1 to 23 filed as main request with letter dated 7 March 2018;
  - description, pages 2 to 8 of the patent specification;
  - figures 1 to 20 of the patent specification.

The Registrar:

The Chairman:



C. Spira

G. Ashley

Decision electronically authenticated