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Case Number: T 2223/09 - 3.2.03

Application Number: 01990080.2

Publication Number: 1364155

IPC: F21S 4/00, F21V 5/00

Language of the proceedings: EN

Title of invention:
Illumination device for simulation of neon lighting

Applicant:
Ilight Technologies, Inc.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54
RPBA Art. 13(1)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Novelty (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 2223/09 - 3.2.03

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 17 October 2011

Appellant: (Applicant)
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Representative:
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Decision under appeal:
Decision of the Examining Division of the European Patent Office posted 23 July 2009 refusing European patent application No. 01990080.2 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: U. Krause
Members: G. Ashley
K. Garnett

Summary of Facts and Submissions

I. This appeal arises from the decision of the examining division to refuse European patent application EP-A-01 990 080 for lack of novelty with respect to DE-U1-297 06 201 (D1). The decision was posted by the examining division on 23 July 2009.

II. The appellant (the applicant) filed notice of appeal on 10 September 2009, paying the appeal fee on the same day; a statement containing the grounds of appeal was filed on 3 November 2011.

III. Oral proceedings were held on 17 October 2011, during which the appellant filed two sets of claims as the first and second auxiliary requests.

IV. Requests

The appellant requests that the above decision be set aside and that a patent be granted on the basis of the main request filed with the grounds of appeal, alternatively on the basis of the first or second auxiliary requests filed during the oral proceedings.

V. Claims

(a) Claim 1 of the main request reads as follows:

"1. An illumination device for simulating neon lighting, comprising:

a substantially rod-like member (12) having a predetermined length with a wave guide having a light

receiving surface (15) and a curved light emitting surface (13) with a predetermined circumferential width, said rod-like member (12) being comprised of a material that has both optical waveguide and light scattering properties;

a multiplicity of spaced point light sources (24) extending along the predetermined length of said rod-like member (12) and positioned adjacent to said light receiving surface (15) for transmitting light emitted by said point light sources (24) into said light receiving surface (15); and

a housing (14) positioned externally and adjacent to said light-receiving surface (15) and defining a volume that encompasses said point light sources (24), whereby said housing (14) has side walls (20), (22) having light-reflecting interior surfaces and serves to collect and direct light emitted by said point light sources (24) into said light receiving surface (15) such that light is preferentially scattered and directed along the predetermined length of said light-transmitting member (12), exiting said light emitting curved surface (13) in an elongated light intensity pattern that has a major axis extending along the predetermined length of said rod-like member (12);

characterised in that

the multiplicity of spaced point light sources (24) are spaced a predetermined distance from the apex of said light emitting surface (15) so as to allow said light intensity pattern on said light emitting surface (13) to have a minor axis extending substantially the

circumferential width of the curved light emitting surface (13) of said rod-like member (12), and

the point light sources (24) being spaced so that the light patterns of adjacent point light sources (24) on said light emitting surface when scattered by the wave guide are such that the elongated light intensity pattern is perceived as being substantially uniform over the length of the light emitting surface (13) irrespective of viewing angle so as to simulate neon lighting; and

an electric connecting member (26) positioned within said housing (14) and adapted to connect said point light sources (24) to a remote power source."

Dependant claims 2 to 5 define preferred embodiments of the illumination device of claim 1.

(b) First Auxiliary Request

Claim 1 of the first auxiliary request reads as that of the main request, but with the following additional feature defined in the characterising portion:

"…so as to simulate neon lighting; and

wherein the spreading of each of the light intensity patterns along the waveguide permits an overlapping of the individual light patterns to provide an observed uniform collective light pattern along and over the entire light emitting surface; and

an electric member (26)…"

(c) Second Auxiliary Request

The preamble of claim 1 of the second auxiliary reads as that of claim 1 of the main request; the characterising portion is as follows:

"…characterised in that

when the device has a height of about 31 mm and a width of about 9.5 mm

the multiplicity of spaced point light sources (24) are spaced about 17.75 to 17.80 mm from the apex of said light emitting surface (15) so as to allow said light intensity pattern on said light emitting surface (13) to have a minor axis extending substantially the circumferential width of the curved light emitting surface (13) of said rod-like member (12), and

the point light sources (24) being spaced apart about 12 mm so that the light patterns of adjacent point light sources (24) on said light emitting surface when scattered by the wave guide are such that the elongated light intensity pattern is perceived as being substantially uniform over the length of the light emitting surface (13) irrespective of viewing angle so as to simulate neon lighting; and

an electric connecting member (26) positioned within said housing (14) and adapted to connect said point light sources (24) to a remote power source."

VI. Submissions of the Appellant

The appellant explained that the purpose of the invention is to use LED lights to simulate neon lighting, which means producing an all-round glow that appears uniform from a wide range of viewing angles.

According to D1 the light from LEDs blends together to form an two-dimensional uniform line of light, but the device of D1 would not be capable of producing the all-round glow associated with a neon light. The circular shape of the light guide shown in Figure 2c indicates that there would be different intensities of glow in different regions of the light guide, with the result that it would not be possible to create uniform light intensity around its circumference.

The appellant went on to argue that D1 is concerned with providing an alternative to neon lighting rather than simulating the effect of neon lighting. This is also evidenced by the reference in D1 to it being a low cost alternative - an illumination device replicating neon lighting is itself not necessarily cheaper, but results in lower running costs.

In summary, the positioning of LEDs to give a uniform glow comparable to neon lights is not derivable from D1, and hence the claimed subject-matter is novel.

Reasons for the Decision

1. The appeal is admissible.

2. Claim 1 of the Main Request - Novelty

2.1 D1 discloses an illumination device comprising a rod-like light guide (5) and a strip of LEDs (4), which in the embodiment shown in Figure 2c is located in an external housing (16) that is in contact with the light guide. It is clear that the light guide has a certain length and has a curved outer surface with a certain circumferential width, both of which, in the wording of claim 1, must have been "predetermined" in one way or another.

2.2 The question is whether or not the illumination device of D1 produces a uniformity of light, as defined in claim 1 and which is comparable to neon light.

2.3 On page 7, lines 7 to 10 of D1 it is said that company names, logos and designs can be illuminated using the new technique as an alternative to advertising using neon lit lettering. It is thus clear that the illumination device of D1 is not just an alternative way of advertising, as argued by the appellant, but is an alternative form of illumination that resembles neon lighting, ie it would have a substantially uniform appearance when viewed from different angles.

2.4 In D1 (see Figure 2c) the strip of LEDs is located adjacent to a light conductor which, like that of the application, is made of acrylic. On page 5, lines 25 to 32 it is said that the edges are treated to prevent light losses, and that the acrylic can contain particles to scatter the light with the purpose of increasing uniformity of the emitted light. It is thus clear that the illumination device of D1 produces a

uniform light intensity over the length of the device, and this has not been disputed by the appellant.

2.5 However, the appellant argues that the light emitted from the device of D1 would not be uniform across the width of the light guide and would not be seen as being uniform from all viewing angles.

2.6 According to claim 1 the elongated light intensity pattern is perceived to be substantially uniform over the length of the light emitting surface. However, there is no express requirement that it is uniform over the width. Rather, claim 1 states that:

"… the multiplicity of spaced point light sources (24) are spaced a predetermined distance from the apex of said light emitting surface (15) so as to allow said light intensity pattern on said light emitting surface (13) to have a minor axis extending substantially the circumferential width of the curved light emitting surface (13) of said rod-like member (12)…"

However, this passage does not define a light intensity pattern across the width of the light guide that is anymore uniform than that disclosed in D1.

2.7 Figure 7C of the application shows the intensity and spread of emitted light, with the maximum intensity at the centre line and tailing off at increasing angles away from the centre. Seen from above, the intensity pattern of an individual LED has an elliptical-like shape as shown in Figure 7E.

2.8 It is clear that a uniform intensity of light can be achieved along the length of the light guide by overlapping the elliptical patterns. However, this will have no effect on providing a uniform intensity across the width, as there is no overlapping of the outputs of multiple light sources in this direction.

2.9 In the embodiment shown in Figure 2c of D1 the light sources are, like those of claim 1, located along a line at some distance below the apex of the light guide, with the consequence that a uniform emission of light resembling a neon light is produced.

According to claim 1, the minor axis of the elliptical shape of emitted light is made to correspond to the width of the surface of the light guide, and this is achieved by spacing the light sources at a particular distance from the apex of the light emitting surface. However, the minor axis is not a clearly defined parameter. The intensity of light diminishes away from the centre of the light intensity pattern and it is not clear at what level of light intensity the boundary of the elliptical shape and hence minor axis should be established. It is thus not possible to establish the predetermined distance for spacing the point light sources from the apex of the light emitting surface.

Thus claim 1 does not provide a clear definition by which it can be concluded that the viewed light intensity is more uniform across the width of the light guide than that of D1.

2.10 It may or may not be the case that the invention disclosed in the present application provides a more

uniform light emission than that of D1, but the wording of D1 provides no distinguishing feature over the illumination device of D1.

The subject-matter of claim 1 thus lacks novelty over D1.

3. Auxiliary Requests

The sets of claims filed as the first and second auxiliary requests were submitted late in the appeal proceedings. Amendments to a party's case after it has filed the grounds of appeal may be admitted at the discretion of the Board (Article 13(1) Rules of Procedure of the Boards of Appeal). Requests filed very late, that is during the oral proceedings, will be admitted only if they *prima facie* overcome the objections raised and meet the requirements of the EPC.

3.1 First Auxiliary Request

Claim 1 of the first auxiliary request requires that the spreading of the light intensity patterns permits an overlapping that provides an observed uniform collective light pattern over the entire light emitting surface.

Regarding this feature, the first impression is that there is no indication as to how a uniform collective light pattern could be achieved over the entire light emitting surface. As in the case of claim 1 of the main request, it is not possible to determine where the light sources should be located in order to achieve this effect. The application is of little help as

Figure 7 merely shows that the light intensity is greater in the centre, with no way of establishing where the minor axis should lie. Given that there are possible objections under Articles 83 EPC (sufficiency of disclosure) and Article 84 EPC (clarity and support for the claims), claim 1 is not *prima facie* allowable and hence the first auxiliary request is not admitted into the proceedings.

3.2 Second Auxiliary Request

Claim 1 of the second auxiliary request provides some dimensions that, according to the appellant, would result in an illumination device having a uniform glow and which corresponds in size to a typical neon tube.

The claim defines the height and width of the illumination device, and the distances the point light sources are spaced apart from each other and from the apex of the light emitting surface. These dimensions are based on the embodiment disclosed in the paragraph bridging pages 14 and 15 of the application.

The device disclosed in this embodiment is also said to have a curved surface with a radius of curvature of about 4.76 mm and have LEDs with a candle power of about 280 mcd. It is not immediately apparent that a device having the claimed dimensions would also produce a uniform light intensity if the LEDs had a different candle power, or if the light emitting surface had a different radius of curvature or was a different shape. There does not seem to be any basis in the application as originally filed for the generalisation of the embodiment just to the dimensions defined in claim 1.

Since amended claim 1 of the second auxiliary request does not *prima facie* meet the requirements of Article 123(2) EPC, the request is also not admissible.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

D. Sauter U. Krause