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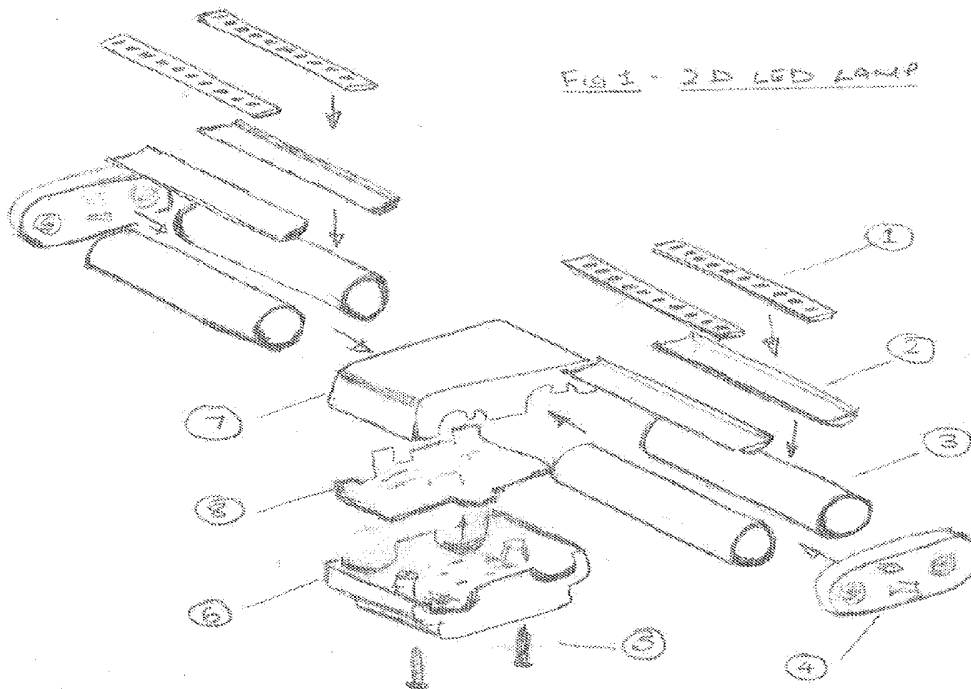
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(56) Documents Cited:  
CN 101858520 A  
Earlsmann product information pdf.

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Other: WPI, EPODOC & TXTEN; Internet: Google

(54) Title of the Invention: 2D light emitting diode (LED) lamp  
Abstract Title: A 2D light emitting diode lamp

(57) A light emitting diode (LED) lamp designed to replace or retrofit a 2D fluorescent tube lamp is formed from four printed circuit boards 1 backed by heat sinks 2 and contained in tubes 3. The tubes 3 are connected to a middle base 7,8,9 which has an electrical connection for connecting to a lamp fitting.



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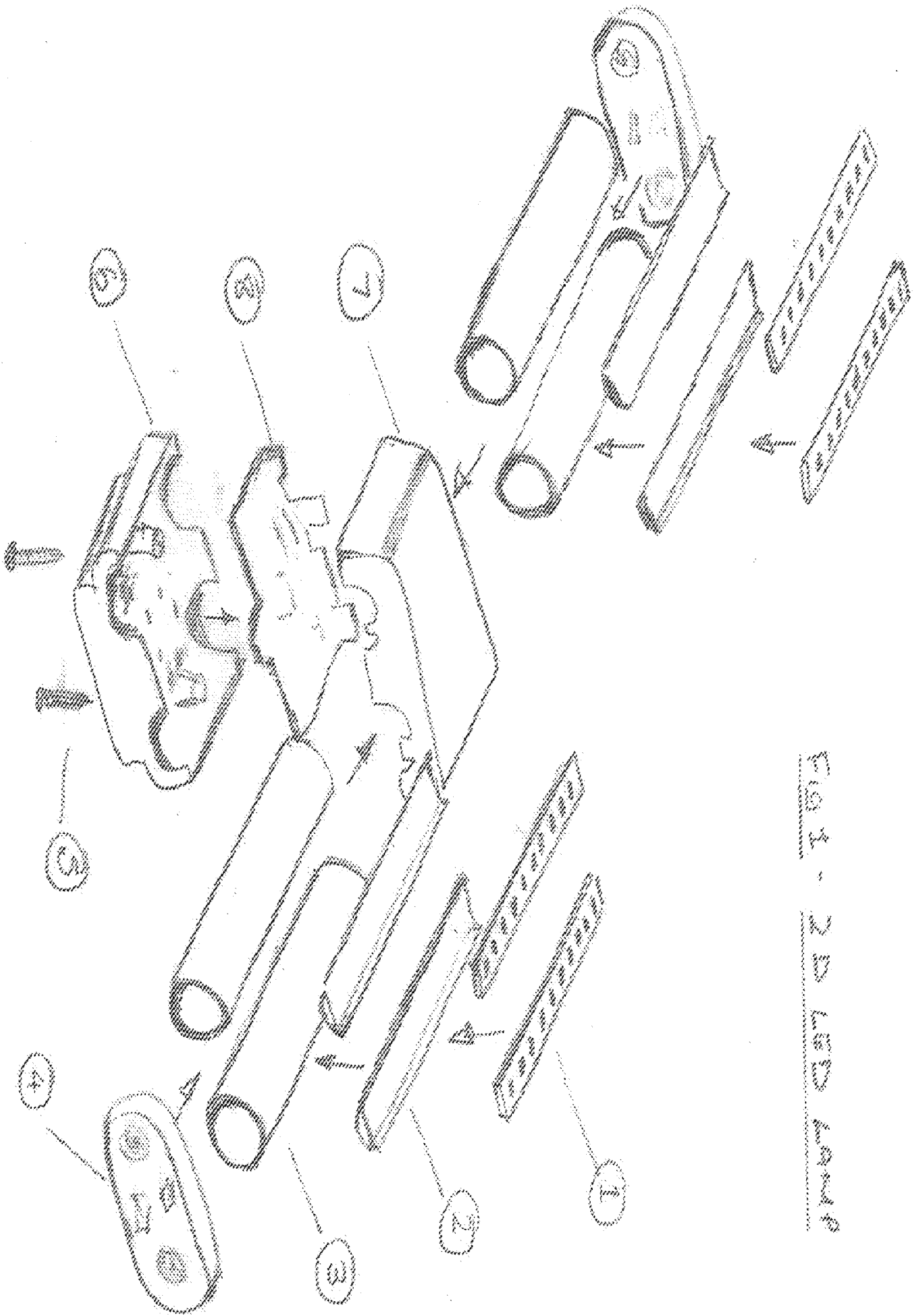


FIG. 1 - 2-D LED LAMP

## 2D Light Emitting Diode (LED) Lamp

This invention relates to a an LED lamp to directly replace a 2D fluorescent tube lamp .

A 2D fluorescent lamp is typically used in lighting public areas that require continuous or near continuous lighting. Typically, 2D fluorescent lamps are rated at 16W or 28W and have a typical lifespan in the region of 8000 hrs continuous usage giving a demand of 128kWh and 224 kWh respectively, with an associated carbon footprint of 55kg and 96kg respectively. 2D fluorescent lamps are constructed from glass tubing and a plastic moulding and are not robust and easily damaged rendering them unusable. With a nominal lifespan of 8000 hrs traditional 2 D fluorescent lamps require replacement at least once a year.

This invention provides a LED lamp to directly replace the 2 D fluorescent lamp without any requirement to alter the existing fitting or electrical wiring while providing an equivalent or better level of lighting. Equivalent LED lamps are rated at 8W or 12W and a typical lifespan of 50,000 hrs, thus their demand is nominally 50% and 57% less than the 2D fluorescent lamp equivalent with the associated running cost and carbon footprint reduction. The 2D LED lamp is robust in construction and will easily withstand shock impact such as being dropped. With a nominal lifespan of 50,000 hrs the 2D LED lamp lasts over 5 times longer.

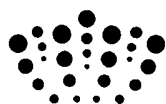
Examples of the invention will now be described by referring to the accompanying drawing

Figure 1 shows the assembly and component parts of the 2D LED lamp

In Figure 1 the illumination is provided by four printed circuit boards (PCB) (1) each mounting multiple LEDs and backed by an aluminum heat-sink (2). Each PCB assembly is housed in a high borosilicate glass tube cover (3), two of which are secured to either side of a plastic middle base assembly comprising an upper (7) and lower cover (6) housing the power unit (8) for each PCB. The upper and lower elements of the middle base assembly are screwed together by two screws (5). Each of the twin borosilicate glass tubes are sealed at the distal end with a plastic end cap (4). The lower cover provides the mechanism for attachment and electrical connection between the lamp and the fitting.

**Claims**

1. A Light Emitting Diode (LED) Lamp to directly replace existing 2D fluorescent tube lamps without any requirement to modify or change the existing fitting or associated electrical wiring
2. An LED Lamp according to claim 1 capable of providing similar or better illumination than an existing 2D fluorescent lamp it is replacing while using 50%, or less, power than the 2D fluorescent lamp it is replacing.
3. An LED Lamp according to claim 1 with a mean time between failures in excess of 4 times that of an equivalent fluorescent tube lamp



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**Examiner:** Mr Joseph Mitchell

**Claims searched:** All

**Date of search:** 18 April 2011

**Patents Act 1977: Search Report under Section 17**

**Documents considered to be relevant:**

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-3	CN 101858520 A (NEW HOTON ELECTRONICS) See EPO abstract.
X	1-3	Earlsmann product information pdf. Available at <a href="http://www.earlsmann.co.uk/files/LED%202D%2010%200910.pdf">http://www.earlsmann.co.uk/files/LED%202D%2010%200910.pdf</a> with apparent publication date of 25/09/2010.

**Categories:**

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

**Field of Search:**

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>X</sup> :

Worldwide search of patent documents classified in the following areas of the IPC

F21K; F21Y; H01J

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC & TXTEN; Internet: Google

**International Classification:**

Subclass	Subgroup	Valid From
F21K	0099/00	01/01/2010
F21Y	0105/00	01/01/2006