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- (71) Applicants (for all designated States except US): APPLIED MULTILAYERS LIMITED [GB/GB]; Garden Court, Unit 2, Gee Road, Coalville, Leicestershire LE67 4NB (GB). CAMBRIDGE DISPLAY TECHNOLOGY LIMITED [GB/GB]; Building 2020, Cambourne Busines Park, Cambridgeshire CB3 6DW (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): WALLS, Michael, John [GB/GB]; Unit 2, Garden Court, Gee Road, Coalville, Leicestershire LE67 4NB (GB). GIBSON, Desmond [GB/GB]; Unit 2, Garden Court, Gee Road, Coalville, Leicestershire LE67 4NB (GB). YOUNG,

William [GB/GB]; Building 2020, Cambourne Busines Park, Cambridgeshire CB3 6DW (GB). PATEL, Nalinkumar [GB/GB]; Building 2020, Cambourne Busines Park, Cambridgeshire CB3 6DW (GB). ANATHASOPOULOU, Nicoletta [GR/GB]; Building 2020, Cambourne Busines Park, Cambridgeshire CB3 6DW (GB).

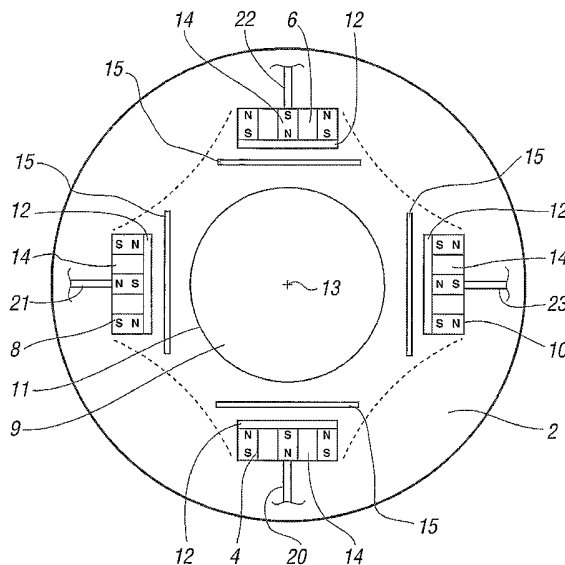
(74) Agent: BAILEY WALSH & CO LLP; 5 York Place, Leeds LS1 2SD (GB).

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[Continued on next page]

(54) Title: APPARATUS AND METHOD FOR THE APPLICATION OF A MATERIAL LAYER TO DISPLAY DEVICES



(57) Abstract: The invention relates to a method and apparatus for the application of material to form a layer of an organic electro-luminescent device. The material is sputter deposited typically from at least one target of material held in respect to a magnetron in a coating chamber. The magnetrons used can be unbalanced magnetrons and/or are provided with other magnetrons and/or magnet arrays in a closed field configuration. The material is found to be deposited in a manner which prevents or minimises damage to the device and hence reduces or removes the need for a barrier layer to be applied.

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RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA,  
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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# INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2006/000550

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. C23C14/35 H05B33/10		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) C23C C12C H05B		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, PAJ		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 91/14797 A (D.G. TEER COATING SERVICES LIMITED) 3 October 1991 (1991-10-03) cited in the application page 3, line 14 - line 29; figures 5,8 -----	1-24, 27-33,41
P,X	WO 2005/110698 A (TEER COATINGS LIMITED; TEER, DENNIS; NAVABPOUR, PARNIA) 24 November 2005 (2005-11-24) page 4, lines 12-17; figure 1 -----	1-24, 27-33,41
X	US 6 423 419 B1 (TEER DENNIS GERALD ET AL) 23 July 2002 (2002-07-23) column 1, line 41 - line 52 column 9, line 3 - line 12 -----	1-24, 27-33,41
X	US 2003/129407 A1 (TEER DENNIS GERALD ET AL) 10 July 2003 (2003-07-10) paragraphs [0018], [0062]; figures -----	1-24, 27-33,41
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.		
<input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents :		
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	
"E" earlier document but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.	
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search  9 May 2006	Date of mailing of the international search report  02. 08. 2006	
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  Slembrouck, I	

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/GB2006/000550

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 385 062 A (* TEER COATINGS LIMITED) 13 August 2003 (2003-08-13) page 5, line 26 - line 29; figure 1 -----	1-24, 27-33,41
T	US 2002/179900 A1 (BUECHEL MICHAEL ET AL) 5 December 2002 (2002-12-05) cited in the application paragraphs [0001], [0016], [0027], [0053] -----	1,27,33
T	US 6 452 218 B1 (CAO YONG) 17 September 2002 (2002-09-17) cited in the application column 1, line 8 - line 16 column 4, line 57 - line 60 column 7, line 13 - line 15 -----	1,27,33
T	US 6 255 774 B1 (PICHLER KARL) 3 July 2001 (2001-07-03) cited in the application column 1, line 4 - line 5 column 1, line 27 - line 29 column 3, line 6 - line 23 column 4, line 1 - line 18 -----	1,27,33
T	US 5 798 170 A (ZHANG ET AL) 25 August 1998 (1998-08-25) cited in the application column 1, line 7 - line 12 column 6, line 13 - line 18 column 8, line 62 - line 67 -----	1,27,33
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T	US 6 605 823 B1 (PICHLER KARL ET AL) 12 August 2003 (2003-08-12) cited in the application column 2, line 6 - line 7 column 3, line 56 - line 67 -----	1,27,33
T	US 6 353 083 B1 (INBASEKARAN MICHAEL ET AL) 5 March 2002 (2002-03-05) cited in the application column 1, line 6 - line 9 column 7, line 37 - line 43 -----	1,27,33
T	US 5 247 190 A (FRIEND ET AL) 21 September 1993 (1993-09-21) cited in the application column 1, line 5 - line 7 column 9, line 29 - line 36; examples 2,4 -----	1,27,33

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB2006/000550

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:  
1-24, 27-33, 41

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.:

The initial phase of the search revealed a very large number of documents relevant to the issue of novelty. So many documents were retrieved that it is impossible to determine which parts of the claim 26 may be said to define subject-matter for which protection might legitimately be sought (Article 6 PCT). For these reasons, the search was performed taking into consideration the non-compliance in determining the extent of the search of claim 26 .

The search of claim 26 was restricted to: the extent of claim 1 and the claims dependant to claim 1 .

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5); should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-24, 27-33, 41

apparatus and method for the application of a layer of material by sputter deposition the material deposition energy being less than 50 eV in the coating chamber; OLED device obtained by such a method

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2. claim: 25

apparatus for the application of a layer of material by sputter deposition, the applied layer of material being applied onto the exposed outer surface of the device formed by the electroluminescent layer or onto a barrier layer overlying said electroluminescent layer

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3. claim: 34

method for the application of a layer of material by sputter deposition, to form an electrode for an electronic or opto-electronic device

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4. claims: 35-37, 41

method for the application of a layer of material by sputter deposition to form a layer as part of an electronic or opto-electronic device

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5. claims: 38, 41

method for the application of a layer of material by sputter deposition to form a layer which in use of the device acts as an electrode

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6. claims: 39-44

method for the application of a layer of material by sputter deposition to form a layer of an electronic or optoelectronic device

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## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2006/000550

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Information on patent family members

International application No

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