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(54) Title: ELECTROLUMINESCENT DISPLAYS

(57) Abstract: Certain materials are electroluminescent, and this electroluminescent effect has been used in the construction of backlights for displays. Such a backlight commonly consists of a transparent front layer (11) known as the substrate carrying over its rear face a transparent electrically-conductive film (12) forming the backlight's front electrode and covered by a layer of electroluminescent/phosphor material (13) over the rear face of which is a high-dielectric layer (16) bearing on its rear face a conductive film (17) forming the back electrode. The whole is positioned behind a mask (18) that defines whatever characters the display is to show. This use of a mask has some disadvantages, some of which can be overcome by utilising an array of suitably shaped individual electrodes (21) instead of a continuous one; however, this itself has drawbacks, since the lead (22) to each electrode acts as an electrode in its own right, activating the phosphor to show faint but distracting additional illumination. The invention deals with this problem of track-derived tails; it proposes firstly that the electroluminescent material itself be shaped into discrete areas (43) each tightly matching in shape and size the relevant individual shaped back electrode (21), and secondly (or in addition) that there be used a shield layer (71) of electrically-conductive material shaped and sized as a negative of the shaped area back electrode (21) and positioned as an intermediate electrode between and aligned with the shaped area electrode (21) and the electroluminescent material layer (43), and given the same electrical potential as the front electrode (12).

INTERNATIONAL SEARCH REPORT

International Application No
PC. / B2004/003411

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 H05B33/14 C09K11/08 C09K11/54 H01J1/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC 7 H05B C09K H01J		
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, INSPEC, COMPENDEX		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 998 171 A (MATSUSHITA ELECTRIC IND CO LTD) 3 May 2000 (2000-05-03) column 4 - column 8; figure 7 -----	1-12
X	US 3 650 824 A (SZEPESI ZOLTAN P J ET AL) 21 March 1972 (1972-03-21) the whole document -----	2, 3, 7, 8
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X	WO 99/55121 A (CAMBRIDGE CONSULTANTS ; COX PAUL (GB); BARNARDO CHRISTOPHER JOHN ANDR) 28 October 1999 (1999-10-28) the whole document -----	2, 7, 10
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
° Special categories of cited documents :		
A document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *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) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed		*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 *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 *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. *&* document member of the same patent family
Date of the actual completion of the international search 14 January 2005		Date of mailing of the international search report 24/01/2005
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 Doslik, N

INTERNATIONAL SEARCH REPORT

Int'l Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 634 835 A (FOO KEN K ET AL) 3 June 1997 (1997-06-03) the whole document -----	2,3,7,8
X	US 6 069 444 A (PACIOREK WALTER J ET AL) 30 May 2000 (2000-05-30) the whole document -----	2,7
A	US 5 757 128 A (TOPP MARK) 26 May 1998 (1998-05-26) the whole document -----	1-12

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 13,14

Claims 13 and 14 are unclear because they refer only to Figures, which are not representing technical features. Further, claim 14 refers to Figure 7, but said Figure fails not under the scope of the alleged invention.

Lack of clarity within the meaning of Article 6 PCT arises to such an extent as to render a meaningful search of the claims impossible.

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.

INTERNATIONAL SEARCH REPORT

national application No.
PCT/GB2004/003411

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.: 13, 14
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:

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.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

 International Application No
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