(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 270 583 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
17.07.2013 Bulletin 2013/29

(43) Date of publication A2:
05.01.2011 Bulletin 2011/01

(21) Application number: **10010385.2**

(22) Date of filing: **20.11.2006**

(51) Int Cl.:
G02F 1/1343 *(2006.01)* *G02F 1/1335* *(2006.01)*
G02F 1/1362 *(2006.01)*

(84) Designated Contracting States:
DE FI FR GB NL

(30) Priority: **05.12.2005 JP 2005350147**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
06024061.1 / 1 793 266

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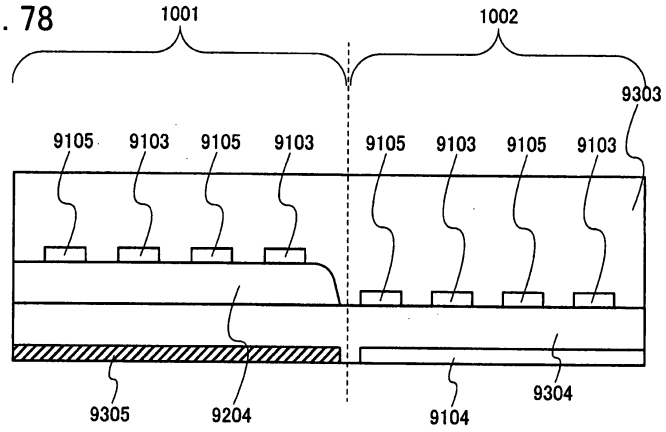
(54) Transmissive and reflective liquid crystal display with a horizontal electric field configuration

(57) Area-division transflective, transmissive and reflective LCDs with an essentially horizontal electric field configuration (such as Fringe Field Switching (FFS)) are disclosed. More than one common electrodes (CE) (9104, 9105, 9305) produce a sufficiently large horizontal field even in liquid crystal regions above the pixel electrode (PE) (9103) and any other CE (9105). The scheme relies on more than one CE-PE pairs. A first pair is made up of a first CE (9104, 9305) and the PE (9103). Both the PE and the first CE are interdigitated (comb- shaped) and the PE is typically arranged on an insulating layer (9204, 9304) over the first CE. A second pair consists of a second CE (9105) typically arranged inside the pixel in substantially the same plane as the PE. The second CE is typically connected to the first CE via a contact hole in the insulating layer. Each pixel may consist of transmissive (1002) and reflective regions (1001), each region exhibiting more than one CE. The CE and the PE may be reflective or transparent or both. In a single pixel the first CE may even be divided into transparent (9104) and reflective (9305) portions.
Keywords: In-plane switching.

FIG. 78



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PARTIAL EUROPEAN SEARCH REPORT

under Rule 62a and/or 63 of the European Patent Convention. This report shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number
EP 10 01 0385

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2005/264720 A1 (ITOU OSAMU [JP] ET AL) 1 December 2005 (2005-12-01) * figure 9 *	1-12	INV. G02F1/1343 ADD. G02F1/1335 G02F1/1362
A	US 2005/128390 A1 (YANG CHIU-LIEN [TW]) 16 June 2005 (2005-06-16) * figure 2 *	1-12	

TECHNICAL FIELDS SEARCHED (IPC)

G02F

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

Place of search	Date of completion of the search	Examiner
Munich	11 June 2013	Thomas, Kenneth

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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EPO FORM 1503 03.82 (P04E07)

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INCOMPLETE SEARCH
SHEET C

Application Number
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Claim(s) completely searchable:
-

Claim(s) searched incompletely:
1-12

Reason for the limitation of the search:

Claims 1-12 extend the subject-matter beyond that of the parent Application and are, consequently, not allowable (Art. 76(1) EPC).
The current application is a divisional application of European application 06 024 061.1 filed on 20.11.2006. In the Invitation pursuant to R.63(1) EPC of 01.02.2013, the Applicant was informed that the subject-matter of the claims did not satisfy Art.76(1) EPC (see also the Guidelines B-VIII, 3 [especially example iv]). After due consideration of the Applicant's reply to the Invitation, the opinion of the Search Division remains nevertheless unchanged.
Claim 1 does not have a directly and unambiguously derivable basis in the parent application (Guidelines (GL), C-IX, 1.4, especially the fifth paragraph) and, consequently, extends the subject-matter as originally disclosed in the parent application. As a result, claim 1 infringes Art.76(1) EPC.
No literal basis for the text (and features) of claim 1 could be found either in the 63 claims or in the 163 pages of the description or in the 112 figures of the parent application as originally filed (o.f.).
Neither could a directly and unambiguously derivable basis for claim 1 be found in the o.f. claims of the parent application. Nor has it been possible to find any directly and unambiguously derivable basis for claim 1 either in the 83 "embodiments" of the description or in the figures of the parent application.
Since the subject-matter of claim 1 is much broader than that of specific o.f. embodiments in the parent application, it follows that in order to arrive at the subject-matter of the claim, some features of specific embodiments must have been left out in the claim. Such omissions would not necessarily extend subject-matter as long as certain conditions were fulfilled (GL, H-V, 3.1, especially (i)-(iii)). In the present case, however, these omitted features, are deemed to be indispensable for the function of the invention as disclosed in each specific o.f. embodiment and their removal would also require a real modification of the other features in order to compensate for the change. In an alternative approach, it can be argued that since there are missing features in claim 1 with respect to specific embodiments, it follows that the omission of such features is not directly and unambiguously derivable from those embodiments. Using either approach, subject-matter has definitely been added and claim 1 violates Art.76(1) EPC.
Since the remaining claims 2-12 all depend ultimately on claim 1 and do not contain all the missing features listed above, they also fail to satisfy the requirements of Art. 76(1) EPC.
Because the Applicant maintained that the claims were nevertheless searchable and did not indicate any alternative subject-matter to be searched, it fell to the Search Division to determine what, if any, subject-matter should be searched (R.63(2) EPC & GL. B-VIII, 3.2.2 (especially the 4th. & 5th. paras.)).
On considering the applicant's reply in the light of the application as a

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INCOMPLETE SEARCH
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whole, it appeared that a restricted interpretation of claim 1 based on the arrangement of fig. 78 (and its associated description) would be best suited to form the subject-matter to be searched (GL B-VIII, 3.2.2 (2nd. para.)).
Since there is no allowable text for the claims on file, no assessment on patentability could be made.
For more detailed reasoning, please see the accompanying Written Opinion.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 01 0385

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-06-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005264720 A1	01-12-2005	JP 4223993 B2	12-02-2009
		JP 2005338264 A	08-12-2005
		US 2005264720 A1	01-12-2005
US 2005128390 A1	16-06-2005	CN 1627134 A	15-06-2005
		US 2005128390 A1	16-06-2005

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	具有水平电场配置的透射和反射液晶显示器		
公开(公告)号	EP2270583A3	公开(公告)日	2013-07-17
申请号	EP2010010385	申请日	2006-11-20
[标]申请(专利权)人(译)	株式会社半导体能源研究所		
申请(专利权)人(译)	半导体能源研究所CO.，LTD.		
当前申请(专利权)人(译)	半导体能源研究所CO.，LTD.		
[标]发明人	KIMURA HAJIME UOCHI HIDEKI		
发明人	KIMURA, HAJIME UOCHI, HIDEKI		
IPC分类号	G02F1/1343 G02F1/1335 G02F1/1362		
CPC分类号	G02F1/133371 G02F1/133553 G02F1/133555 G02F1/134363 G02F1/136209 G02F2001/134372 G02F2001/136222 G02F2201/124 G02F1/1343 G02F1/13439 G02F1/1368 G02F1/133345 G02F1/136227 G02F1/136286 G02F2201/121 G02F2201/123		
代理机构(译)	GRÜNECKER，KINKELDEY，STOCKMAIR & SCHWANHÄUSSER		
审查员(译)	THOMAS，KENNETH		
优先权	2005350147 2005-12-05 JP		
其他公开文献	EP2270583A2 EP2270583B1		
外部链接	Espacenet		

摘要(译)

公开了具有基本水平电场配置（例如边缘场切换（FFS））的区域透射，透射和反射LCD。即使在像素电极（PE）（9103）和任何其他CE（9105）上方的液晶区域中，一个以上的公共电极（CE）（9104,9105,9305）也产生足够大的水平场。该方案依赖于多个CE-PE对。第一对由第一CE（9104,9305）和PE（9103）组成。 PE和第一CE都是相互交叉的（梳状），并且PE通常布置在第一CE上的绝缘层（9204,9304）上。第二对包括通常在与像素PE基本相同的平面内布置在像素内的第二CE（9105）。第二CE通常经由绝缘层中的接触孔连接到第一CE。每个像素可以由透射（1002）和反射区域（1001）组成，每个区域表现出多于一个CE。 CE和PE可以是反射的或透明的或两者。在单个像素中，第一CE甚至可以分成透明（9104）和反射（9305）部分。关键词：面内切换。