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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: LOW SURFACE ENERGY POLYMERIC MATERIAL FOR USE IN LIQUID CRYSTAL DISPLAYS

(57) Abstract: Generally, the presently disclosed subject matter relates to a liquid crystal display including one or more layers of a polymeric material. More particularly, the polymeric material is a low surface energy polymer material fabricated from a mold.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/03983

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **G02F 1/1337**(2006.01)

USPC: 349/123

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)

U.S. : 349/123

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 practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2006/0035086 A1 (Amos et al) 16 Feb. 2006 (16.02.2006) paragraphs 0003-0020	1-5,15-26,31-33,37-44,47-55,58-63,66-74,77-78,81-83
Y	US 4,647,157 (Chiklis) 03 March 1987 (03.03.1987), col.3, lines 40-66	7,9-10
Y	US 5,744,203 (Harada et al) 28 April 1998, col.2, lines 23-31; col.3, lines 39-42; col.8, lines 18-30; col.10, lines 15-18;	8,11-12
Y	US 5,455,697 (coles et al) 03 Oct.1995 (03.10.1995), col.2, lines 18-34;	13-14,57,76
Y	US 5,516,455 (Jacobine et al) 14 May 1996 (14.05.1996), col.6, lines 20-38	13-14,57,76

☐ Further documents are listed in the continuation of Box C.

☐ 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

"E" earlier application or patent 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

25 July 2006 (25.07.2006)

Date of mailing of the international search report

15 SEP 2006

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/03983

Box No. 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.: 45 and 46
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:
Please See Continuation Sheet
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 No. 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:
Please See Continuation 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 additional fees, this Authority did not invite payment of any additional fees.
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 and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
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Continuation of Box II Reason 2:

the treatment selected from the group consisting of an electrical conductor, metal nanoparticles, metal oxide, conducting polymer, toluene, and water ; and the display screen is flexible about 90 degree curvature that are no meaningful search could be carried out.

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-44, 47-48, 70-140, drawn to an alignment layer using low surface energy polymer material having curing agent.

Group II, claim(s) 49-69, drawn to a method of fabricating a display screen alignment.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The special technical feature of Group I is an alignment layer using low surface energy polymer material having curing agent. The special technical feature of Group II is a method of fabricating a display screen alignment wherein a replica of the patterned template is embossed on a surface of the cured low surface energy polymeric material. Therefore, unity of invention is lacking.