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CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,
KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
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NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD,
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LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK,
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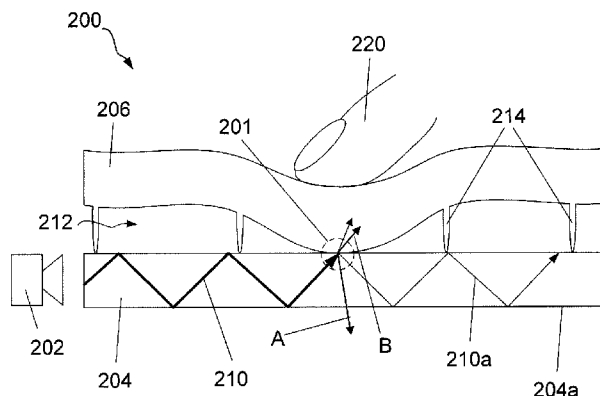


FIG. 2A

(57) Abstract: A touch - screen device includes a radiation source (202), a waveguide (204) configured to receive radiation (210) emitted by the source and to cause some of the radiation (A) to undergo total internal reflection within the waveguide, a piable frustrating layer (206) disposed relative to the waveguide to enable the frustrating layer to contact (201) the waveguide when the frustrating layer is physically deformed, the frustrating layer being configured to cause frustration of the total internal reflection of the received radiation within the waveguide when the frustrating layer is physically deformed to contact the waveguide such that some of the received radiation (A,B) escapes from the waveguide at the contact point, an imaging sensor (208) configured to detect some of the radiation that escapes from the waveguide, and a structure (309,409, 509, 609,709, 809,909, 1009, 1109, 1209, 1309, 1409) disposed relative to the frustrating layer, the structure configured to steer at least a portion of the radiation (A) that escapes from the waveguide toward the imaging sensor (208).



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A. CLASSIFICATION OF SUBJECT MATTER
 INV. G06F3/042
 ADD.

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)
G06F G02B

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>HAN J Y: "Low-cost multi-touch sensing through frustrated total internal reflection", UIST 05. PROCEEDINGS OF THE 18TH. ANNUAL ACM SYMPOSIUM ON USER INTERFACE SOFTWARE AND TECHNOLOGY,, [Online] 23 October 2005 (2005-10-23), pages 115-118, XP007905448, ISBN: 978-1-59593-023-1 Retrieved from the Internet: URL:http://portal.acm.org/citation.cfm?id=1095054> page 116, left-hand column - page 117, right-hand column; figure 3 ----- -/--</p>	<p>1-29, 37-55</p>

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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.</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search 15 April 2011	Date of mailing of the international search report 28/04/2011
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Chéron, Laurent
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International 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 2008/179507 A2 (HAN JEFFERSON Y [US] HAN JEFFERSON [US]) 31 July 2008 (2008-07-31) paragraphs [0127] - [0136], [0143] - [0145]; figures 2,3 paragraphs [0146] - [0148], [0151] - [0154]; figure 5 paragraph [0157]; figure 8 paragraph [0158] - paragraph [0159]; figure 9 paragraphs [0161] - [0163] -----	1-29, 37-55
X	US 2008/192025 A1 (JAEGER DENNY [US] ET AL) 14 August 2008 (2008-08-14) paragraphs [0030] - [0035], [0041] - [0045]; figures 1,2,7a-8c -----	1-29, 37-55
X	US 2008/284925 A1 (HAN JEFFERSON Y [US]) 20 November 2008 (2008-11-20) paragraphs [0076] - [0084]; figures 2-2c paragraphs [0087] - [0090]; figures 3,4 paragraphs [0095] - [0096]; figure 5 paragraphs [0099] - [0100]; figures 7a-7b paragraphs [0105] - [0110]; figures 8-9 paragraphs [0112] - [0115]; figure 10 paragraphs [0118] - [0119]; figure 12 paragraphs [0124] - [0126]; figure 14 paragraph [0135] -----	1-29, 37-55
X	US 2006/279558 A1 (VAN DELDEN MARTINUS HERMANUS W [DE] ET AL) 14 December 2006 (2006-12-14) paragraphs [0042] - [0043]; figure 2 paragraphs [0044] - [0045]; figure 3 paragraphs [0047] - [0048]; figures 4,5 paragraph [0050]; figure 6 -----	1,14,20, 21, 25-27, 37,43, 45,46, 50-52
X	WO 2005/029395 A2 (KONINKL PHILIPS ELECTRONICS NV [NL]; GIRALDO ANDREA [NL]; DESTURA GALI) 31 March 2005 (2005-03-31) page 8, line 3 - page 10, line 28; figures 3-8 ----- -/--	1,5-9, 15-18, 20,21, 25-27, 37-41, 43-46, 50-52

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2010/036684

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>JP 10 162698 A (IDEC IZUMI CORP) 19 June 1998 (1998-06-19)</p> <p>paragraphs [0076] - [0098]; figures 10-17 abstract</p>	<p>1,3-6, 14-17, 19-21, 25, 37-41, 43-46,50</p>
X	<p>-----</p> <p>US 2006/227120 A1 (EIKMAN ADAM [US]) 12 October 2006 (2006-10-12) paragraph [0002] page 8 paragraph [0018]; figure 1 paragraph [0021]; figure 2 paragraphs [0022] - [0023]; figure 3 paragraphs [0024] - [0025]; figure 4 paragraph [0030]; figure 5 paragraphs [0032], [0033], [0036]; figure 6</p>	<p>30-36</p>
X	<p>-----</p> <p>US 4 484 179 A (KASDAY LEONARD R [US]) 20 November 1984 (1984-11-20) column 2, line 15 - line 38 column 3, line 1 - line 47; figure 1 column 4, line 1 - line 58; figures 2,3 column 5, line 55 - column 6, line 55; figures 8,8</p>	<p>30-36</p>
A	<p>-----</p> <p>US 2007/152985 A1 (OSTERGAARD JENS WAGENBLAST S [DK] ET AL) 5 July 2007 (2007-07-05) paragraphs [0029] - [0035]; figure 1 paragraphs [0053] - [0059]; figure 5 paragraph [0062]; figure 7 paragraphs [0071] - [0072]; figure 10</p>	<p>1,16,17, 20,21, 37,45,46</p>
A	<p>-----</p> <p>WO 2007/003196 A2 (O PEN APS [DK]; ELIASSON JONAS OVE PHILIP [DK]; OESTERGAARD JENS WAGEN) 11 January 2007 (2007-01-11) page 7, line 13 - page 10, line 26; figure 1 page 11, line 21 - page 13, line 5; figures 3a-4</p>	<p>1,3-6, 15-17, 37-41,44</p>
A	<p>-----</p> <p>JP 8 050526 A (FUJITSU LTD) 20 February 1996 (1996-02-20) abstract figures 1,2,4</p>	<p>1,16,17, 37</p>
	<p>-----</p> <p style="text-align: center;">-/--</p>	

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/036684

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>TAIRA Y ET AL: "LOW-POWER LCD USING A NOVEL OPTICAL SYSTEM", 2002 SID INTERNATIONAL SYMPOSIUM DIGEST OF TECHNICAL PAPERS. BOSTON, MA, MAY 21 - 23, 2002; [SID INTERNATIONAL SYMPOSIUM DIGEST OF TECHNICAL PAPERS], SAN JOSE, CA : SID, US, vol. 33, no. 2, 1 May 2002 (2002-05-01), pages 1313-1315, XP001134339, the whole document</p> <p align="center">-----</p>	<p>3-6, 15-17, 38-41,44</p>

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/036684

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.:
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:

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:

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 fees, this Authority did not invite payment of 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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-29, 37-55

FTIR based touch screen with structure steering scattered light towards optical sensor.

2. claims: 30-36

FTIR based touch screen with structure redirecting scattered light back into the optical waveguide.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/036684

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008179507	A2	31-07-2008	US 2008029691 A1 07-02-2008

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