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[Continued on next page]

(54) Title: TOUCH SENSING SYSTEMS

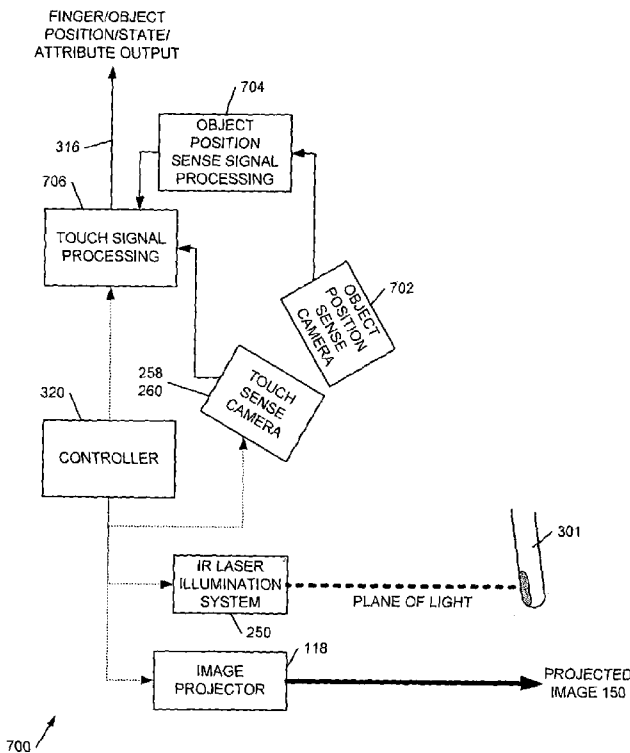


Figure 7b

(57) Abstract: M&C PC926457WO 4 3997988-1-pmartin
ABSTRACT: A touch sensing system, for sensing the position of at least one object with respect to surface, the system comprising: a first, 2D touch sensing subsystem to detect a first location of said object with respect to a surface and to provide first location data; a second, object position sensing subsystem to detect a second location of said object, wherein said second location of said object is not constrained by said surface, and to provide second location data; a system to associate said first location data and said second location and to determine additional object-related data from said association; and a system to report position data for said object, wherein said position data comprises data dependent on at least one of said first and second locations and on said additional object-related data.

WO 2013/144599 A3



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

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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(88) Date of publication of the international search report:

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INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2013/050765

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

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)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/021287 A1 (TOMASI CARLO [US] ET AL) 21 February 2002 (2002-02-21) cited in the application paragraph [0043] - paragraph [0045]; figure 1B paragraph [0030]	1-17,20
A	----- US 7 242 388 B2 (LIEBERMAN KLONY [IL] ET AL) 10 July 2007 (2007-07-10) cited in the application column 17, line 23 - line 55; figures 15A, 15B	1-17,20
A	----- US 2006/158435 A1 (LIN CHIH-HSIUNG [TW] ET AL) 20 July 2006 (2006-07-20) page 1, paragraph 0017; figure 1 ----- -/--	1-17,20

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 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

3 July 2013

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2013/050765

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.:

1-17, 20

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: 1-17, 20

Touch sensing comprising:projecting a light defining a touch sheet above a surface;capturing a touch sense image from a region including at least a portion of said touch sheet, said touch sense image comprising light scattered from said touch sheet by an object approaching said displayed image; andprocessing said touch sense image to identify a location of said object relative to said displayed image;capturing a second image from a region above said displayed image.

2. claim: 18

A method of calibrating a system, the method comprising:projecting a calibration pattern;capturing images from said touch sensing subsystem and said second object position sensing subsystem/camera; anddetermining respective spatial distortion-correcting calibrations from the calibration pattern.

3. claim: 19

A method of capturing a user action in a system, the method comprising:identifying a first touch with a first object at a first location;distinguishing a second touch with a second, different object at a second different location; and determining a user action dependent on one or both of a distance and a direction of said second touch with reference to said first touch.

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2013/050765

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2006/118760 A2 (MOTOROLA INC [US]; TRACY JAMES L [US]) 9 November 2006 (2006-11-09) page 10, paragraph 2 - paragraph 3; figure 4 -----	1-17,20
A	WO 2010/073045 A2 (LIGHT BLUE OPTICS LTD [GB]; LAWRENCE NICHOLAS ALEXANDER [GB]; BALLASTE) 1 July 2010 (2010-07-01) cited in the application page 15, paragraph 4 - page 16, paragraph 1; figure 1 -----	1-17,20
A	US 2010/231522 A1 (LI DONG GE [US]) 16 September 2010 (2010-09-16) paragraph [0101] - paragraph [0103]; figure 21 -----	1-17,20

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/GB2013/050765

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		WO 2010073047 A1	01-07-2010

US 2010231522 A1	16-09-2010	NONE	
