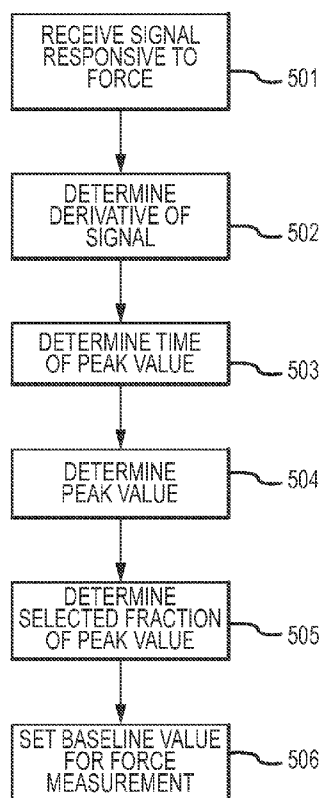




- (51) International Patent Classification:  
*G06F 3/041* (2006.01)
- (21) International Application Number:  
PCT/US2013/031818
- (22) International Filing Date:  
15 March 2013 (15.03.2013)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
61/695,287 30 August 2012 (30.08.2012) US
- (71) Applicant: APPLE INC. [US/US]; One Infinite Loop, Cupertino, California 95014 (US).
- (72) Inventor: HARLEY, Jonah A.; One Infinite Loop, MS: 305-1PD, Cupertino, CA 95014 (US).
- (74) Agents: HEMENWAY, S. Craig et al.; Brownstein Hyatt Farber Schreck, LLP, 410 Seventeenth Street, Suite 2200, Denver, Colorado 80202 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AL, AT, AU, BG, BH, BR, BW, CA, CH, CN, CO, CZ, DE, DK, EC, EE, ES, FI, GB, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KR, LR, LS, LT, LU, LY, MA, MK, MN, MW, MX, MY, MZ, NA, NO, NZ, PE, PG, PH, PL, PT, QA, RO, RS, RW, SD, SE, SG, SK, SL, SM, SV, SY, TN, TR, TZ, UG, US, VC, ZA.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: AUTO-BASELINE DETERMINATION FOR FORCE SENSING



(57) Abstract: Determining an applied force of touch on a touch device, in response to a time-varying signal generated by a force of touch sensor. Inferring a measure of force of touch in response to that signal, by determining a peak value of a time derivative of that signal, determining a fraction of that peak value, determining a force of touch corresponding to that peak value, and setting that force as a baseline value for a particular user. Responding to force of touch by the user by comparing against that baseline value. Distinguishing between users having differing baseline values.

FIG. 7



GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR).

— *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))*

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

16 June 2016

**Published:**

— *with international search report (Art. 21(3))*

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2013/031818

A. CLASSIFICATION OF SUBJECT MATTER  
INV. G06F3/041  
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)

EP0-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 2009/228791 A1 (KIM JONG HO [KR] ET AL) 10 September 2009 (2009-09-10)	13, 16-18, 31,34-36
A	paragraphs [0053], [0055], [0064]; figures	1-12,15, 19-30,33
	-----	
X	US 2006/132456 A1 (ANSON DAVID L A [US] ANSON DAVID LEININGER ADOLPHSON [US]) 22 June 2006 (2006-06-22)	13, 16-18, 31,34-36
A	paragraphs [0058], [0059], [0094]; figures	1-12,15, 19-30,33
	-----	
X	US 2010/123686 A1 (KLINGHULT GUNNAR [SE] ET AL) 20 May 2010 (2010-05-20)	13, 16-18, 31,34-36
A	paragraph [0084] - paragraph [0087]	1-12,15, 19-30,33
	-----	
	-/--	



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

29 May 2013

Date of mailing of the international search report

03/05/2016

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

Durand, Jacques

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2013/031818

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2009/019949 A1 (ROTHKOPF FLETCHER R [US] ET AL) 22 January 2009 (2009-01-22)  paragraph [0048] - paragraph [0050] -----	1-13, 15-31, 33-36
A	US 2003/206162 A1 (ROBERTS JERRY B [US]) 6 November 2003 (2003-11-06)  paragraph [0083] - paragraph [0088]; figures -----	1-13, 15-31, 33-36

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2013/031818

### 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.:

1-13, 15-31, 33-36

#### 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: 1-13, 15-31, 33-36

Apparatus including  
a touch device including one or more force of touch sensors,  
said force of touch sensors being capable of providing a  
time-varying signal with respect to a force of touch on said  
touch device;  
one or more processors having access to said time-varying  
signal, said processors disposed to determine a derivative  
of said signal, a baseline value in response to said  
derivative, said baseline value being associated with a  
particular user, and a comparison for said particular user  
of said force of touch against said baseline value for that  
particular user;  
wherein said touch device is disposed to distinguish between  
a first type of touch having less force of touch than said  
baseline value for that particular user, and a second type  
of touch having more force than said baseline value for that  
particular user.

---

2. claims: 14, 32

Apparatus including  
a touch device including one or more force of touch sensors,  
said force of touch sensors being capable of providing a  
signal responsive to a force of touch;  
one or more processors having access to said signal, said  
processors having access to instructions, said instructions  
directing said processors to determine a baseline value in  
response to said signal, wherein said baseline value is  
substantially stable for a particular user;  
wherein said touch device is responsive to whether said  
force of touch exceeds said baseline value for said  
particular user and wherein  
said processors have access to instructions, said  
instructions directing said processors  
to distinguish a first particular user from a second  
particular user in response to said baseline value.

---

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/031818

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009228791 A1	10-09-2009	JP 2009217801 A KR 20090096998 A US 2009228791 A1	24-09-2009 15-09-2009 10-09-2009
US 2006132456 A1	22-06-2006	US 2006132456 A1 US 2010060606 A1	22-06-2006 11-03-2010
US 2010123686 A1	20-05-2010	CN 102216885 A EP 2359225 A2 JP 2012509605 A KR 20110086149 A US 2010123686 A1 WO 2010058301 A2	12-10-2011 24-08-2011 19-04-2012 27-07-2011 20-05-2010 27-05-2010
US 2009019949 A1	22-01-2009	CN 201234245 Y US 2009019949 A1 US 2009020343 A1 WO 2009012183 A2	06-05-2009 22-01-2009 22-01-2009 22-01-2009
US 2003206162 A1	06-11-2003	AU 2003226017 A1 CN 1653411 A EP 1520220 A2 JP 2006512626 A KR 20040102213 A TW 200402649 A US 2003206162 A1 WO 03096266 A2	11-11-2003 10-08-2005 06-04-2005 13-04-2006 03-12-2004 16-02-2004 06-11-2003 20-11-2003