

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
8 November 2007 (08.11.2007)

PCT

(10) International Publication Number
WO 2007/127585 A3

(51) International Patent Classification:

G06F 3/048 (2006.01)

(21) International Application Number:

PCT/US2007/066022

(22) International Filing Date: 5 April 2007 (05.04.2007)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

11/380,109

25 April 2006 (25.04.2006) US

(71) Applicant (for all designated States except US): **APPLE INC.** [US/US]; 1 Infinite Loop, Cupertino, CA 95014 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **WESTERMAN, Wayne, Carl** [US/US]; 260 King Street, Apartment 1507, San Francisco, CA 94107 (US).

(74) Agent: **ALLEN, III, Billy, C.**; Wong, Cabello, Lutsch, Rutherford & Bruculeri LLP, 20333 Sh 249, Suite 600, Houston, TX 77070 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, 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, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

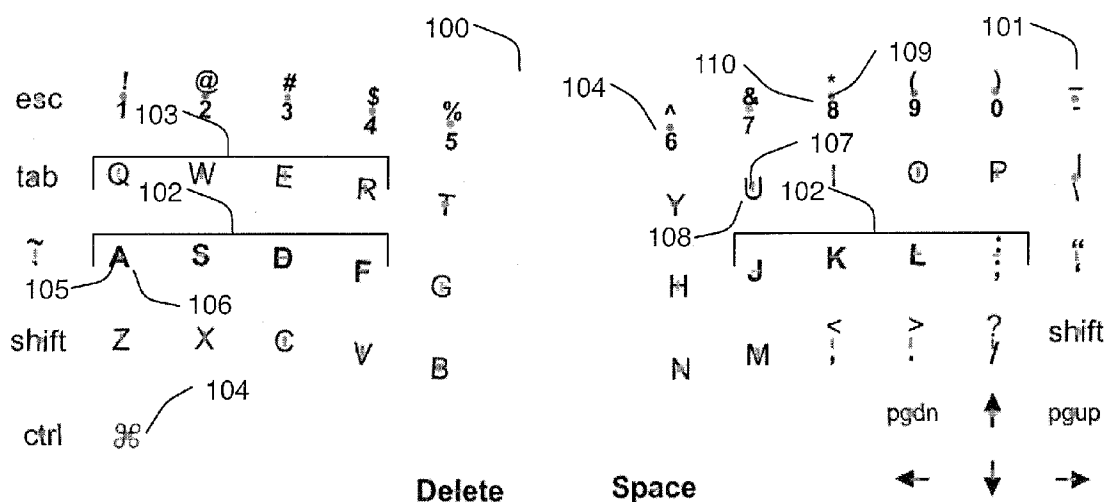
Published:

— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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

21 February 2008

(54) Title: KEYSTROKE TACTILITY ARRANGEMENT ON A SMOOTH TOUCH SURFACE



(57) Abstract: Disclosed are four arrangements for providing tactility on a touch surface keyboard. One approach is to provide tactile feedback mechanisms, such as dots, bars, or other shapes on all or many keys. In another embodiment, an articulating frame may be provided that extends when the surface is being used in a typing mode and retracts when the surface is used in some other mode, e.g., a pointing mode. The articulating frame may provide key edge ridges that define the boundaries of the key regions or may provide tactile feedback mechanisms within the key regions. The articulating frame may also be configured to cause concave depressions similar to mechanical key caps in the surface. In another embodiment, a rigid, non-articulating frame may be provided beneath the surface. A user will then feel higher resistance when pressing away from the key centers, but will feel a softer resistance at the key center.

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2007/066022

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F3/048

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 H01H

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.
X A	US 2004/229663 A1 (TOSEY JOSEPH P R [CA] ET AL) 18 November 2004 (2004-11-18) paragraphs [0032] - [0034]; figures 2,12	1-6 16-20, 23-27
X A	GB 2 009 047 A (SAFEWAY STORES) 13 June 1979 (1979-06-13) the whole document	1-6 16-20, 23-27
X	DE 103 24 580 A1 (DAIMLER CHRYSLER AG [DE]) 16 December 2004 (2004-12-16) paragraphs [0001], [0002] paragraph [0014] paragraph [0023] paragraphs [0047] - [0055] paragraph [0063]; figures 1-5	7-27
	-/--	

☒ 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 document 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.
- *G* document member of the same patent family

Date of the actual completion of the international search

19 December 2007

Date of mailing of the international search report

02/01/2008

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Mouton, Benjamin

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2007/066022

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 2004/109488 A (IMMERSION CORP [US]; HAYWARD VINCENT [CA]) 16 December 2004 (2004-12-16) page 9, line 27 - page 11, line 17; figures 4-8 -----	7-10, 15, 21, 22
A	EP 0 915 490 A (NIPPON COLUMBIA [JP]) 12 May 1999 (1999-05-12) the whole document -----	1-6, 16-20, 23-27
A	WO 99/38149 A (WESTERMAN WAYNE [US]; ELIAS JOHN G [US]) 29 July 1999 (1999-07-29) page 12, last paragraph - page 13, paragraph 1 -----	11-14

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/066022

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2004229663	A1	18-11-2004	CA 2520531 A1 WO 2004102934 A1 CN 1792079 A EP 1625732 A1	25-11-2004 25-11-2004 21-06-2006 15-02-2006
GB 2009047	A	13-06-1979	AU 523669 B2 AU 4196478 A CA 1132114 A1 US 4180336 A	12-08-1982 31-05-1979 21-09-1982 25-12-1979
DE 10324580	A1	16-12-2004	NONE	
WO 2004109488	A	16-12-2004	DE 112004000918 T5 EP 1631893 A2	02-11-2006 08-03-2006
EP 0915490	A	12-05-1999	JP 11144553 A	28-05-1999
WO 9938149	A	29-07-1999	AU 759440 B2 AU 2467399 A CA 2318815 A1 EP 1058924 A1 IL 137478 A JP 2002501271 T JP 2007226820 A JP 2007242035 A JP 2007184006 A JP 2007193840 A JP 2007184007 A JP 2007184008 A JP 2007213599 A KR 20060053010 A KR 20060058784 A KR 20060059263 A KR 20060053011 A KR 20060059264 A KR 20060059265 A KR 20060053012 A KR 20060058731 A KR 20060058732 A US 6323846 B1 US 2002015024 A1	17-04-2003 09-08-1999 29-07-1999 13-12-2000 20-11-2005 15-01-2002 06-09-2007 20-09-2007 19-07-2007 02-08-2007 19-07-2007 19-07-2007 23-08-2007 19-05-2006 30-05-2006 01-06-2006 19-05-2006 01-06-2006 01-06-2006 19-05-2006 30-05-2006 30-05-2006 27-11-2001 07-02-2002