

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
6 August 2009 (06.08.2009)

PCT

(10) International Publication Number
WO 2009/097361 A3

(51) International Patent Classification:
H01H 13/85 (2006.01) G06F 3/01 (2006.01)

(21) International Application Number:
PCT/US2009/032292

(22) International Filing Date:
28 January 2009 (28.01.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/024,421 29 January 2008 (29.01.2008) US
12/360,316 27 January 2009 (27.01.2009) US

(71) Applicant (for all designated States except US):
PACINIAN CORPORATION [US/US]; 665 N. Riverpoint Blvd., Suite 344, Spokane, WA 99202 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): PETERSON, Cody, George [US/US]; 2937 North 7th Street, Coeur D' Alene, ID 83815 (US). HUSKA, Andrew, P. [US/US]; 2521 Partridge Loop, Post Falls, ID 83854 (US). SCHLOSSER, James, William [US/US]; 4418 S. Williamson Lane, Spokane, WA 99223 (US).

(74) Agent: MORASCH, David, A.; Sadler Breen Morasch & Colby, ps, 422 W. Riverside Avenue, Suite 424, Spokane, WA 99201 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, 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, ME, 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, ST, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, 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 (Art. 21(3))
- 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:
15 October 2009

(54) Title: HAPTIC KEYBOARD SYSTEMS AND METHODS

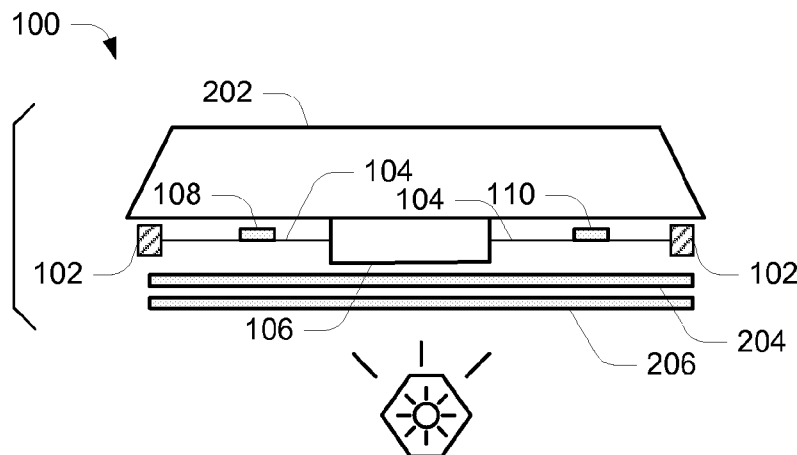


Fig. 2

(57) Abstract: Various embodiments provide keyboards that utilize electrically-deformable material as an actuating mechanism to provide haptic feedback to a user of the keyboard. In at least some embodiments, the electrically-deformable material is utilized to impart, to a depressed key or keyboard element, a multi-vectored movement that produces a perceived acceleration of the key or keyboard element thus providing a user with haptic feedback which simulates a snapover movement. In at least some embodiments, a light source can be mounted or otherwise positioned relatively close to and beneath the top surface of one or more keys or keyboard elements to backlight a portion or portions of a keyboard.



WO 2009/097361 A3

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2009/032292

A. CLASSIFICATION OF SUBJECT MATTER
 INV. H01H13/85 G06F3/01

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)

H01H G06F H03K

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	DE 20 2005 002417 U1 (LOEWE OPTA GMBH [DE]) 7 April 2005 (2005-04-07)	1, 4-6, 8-10, 13, 15, 19-26
Y	paragraphs [0008], [0010], [0011] claim 3 figures 1, 2	2, 7, 16, 18, 27
Y	US 2007/152974 A1 (KIM KYU-YONG [KR] ET AL) 5 July 2007 (2007-07-05) paragraphs [0040] - [0044], [0057] - [0059], [0063] - [0068], [0084], [0085], [0093] figures 7, 8, 10A-F	2, 11, 16
Y	EP 1 548 776 A (SIEMENS AG [DE]) 29 June 2005 (2005-06-29) paragraphs [0021] - [0024]; figures 1, 3, 4	2, 11, 16
	-/--	

 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.

Z document member of the same patent family

Date of the actual completion of the international search

3 August 2009

Date of mailing of the international search report

11/08/2009

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

Glaman, C

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/032292

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 10 2004 005501 A1 (AURENZ GMBH [DE]) 18 August 2005 (2005-08-18) paragraphs [0026], [0028], [0032], [0039] figures 1,4 -----	7,14,18, 27
X	DE 197 04 253 A1 (HELLA KG HUECK & CO [DE]) 6 August 1998 (1998-08-06) abstract; claim 1; figure 2 -----	8,9
Y	DE 101 26 670 A1 (BAYERISCHE MOTOREN WERKE AG [DE]) 5 December 2002 (2002-12-05) paragraphs [0019], [0023] figures 1,2 -----	10,11, 13,14
Y	US 5 239 152 A (CALDWELL DAVID W [US] ET AL) 24 August 1993 (1993-08-24) column 2, lines 31-68 figure 1 -----	10
Y	US 5 239 152 A (CALDWELL DAVID W [US] ET AL) 24 August 1993 (1993-08-24) column 2, lines 31-68 figure 1 -----	13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/032292

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 allsearchable 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: 1-7,15-28

Keyboard comprising an electrically-deformable material operably associated with at least some of the plurality of keys and configured to actuate associated keys.

2. claims: 8-14

Keyboard comprising an actuating mechanism, other than an elastomeric dome actuating mechanism, associated with at least some of the plurality of keys or keyboard elements.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2009/032292

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 202005002417 U1	07-04-2005	NONE	
US 2007152974 A1	05-07-2007	KR 20070073125 A	10-07-2007
EP 1548776 A	29-06-2005	WO 2005062323 A1	07-07-2005
DE 102004005501 A1	18-08-2005	NONE	
DE 19704253 A1	06-08-1998	NONE	
DE 10126670 A1	05-12-2002	NONE	
US 5239152 A	24-08-1993	NONE	