US008232973B2

(12) **United States Patent**
**Kocienda et al.**

(10) **Patent No.: US 8,232,973 B2**
(45) **Date of Patent: Jul. 31, 2012**

(54) **METHOD, DEVICE, AND GRAPHICAL USER INTERFACE PROVIDING WORD RECOMMENDATIONS FOR TEXT INPUT**

(75) Inventors: **Kenneth Kocienda**, Sunnyvale, CA (US); **Greg Christie**, San Jose, CA (US); **Bas Ording**, San Francisco, CA (US); **Scott Forstall**, Mountain View, CA (US); **Richard Williamson**, Los Gatos, CA (US); **Jerome René Bellegarda**, Saratoga, CA (US)

(73) Assignee: **Apple Inc.**, Cupertino, CA (US)

( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1066 days.

(21) Appl. No.: **12/165,554**

(22) Filed: **Jun. 30, 2008**

(65) **Prior Publication Data**

US 2009/0174667 A1 Jul. 9, 2009

**Related U.S. Application Data**

(60) Provisional application No. 61/010,619, filed on Jan. 9, 2008.

(51) **Int. Cl.**
***G06F 3/041*** (2006.01)
*G06F 3/02* (2006.01)
*G06F 3/048* (2006.01)

(52) **U.S. Cl.** ..... **345/173**; 345/168; 345/169; 715/256; 715/773

(58) **Field of Classification Search** ..... 345/156, 345/168–169, 171–178; 704/1, 8–10; 715/257–261
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

| | | | | |
|---|---|---|---|---|
| 5,305,205 | A | 4/1994 | Weber et al. | 364/419.1 |
| 5,581,484 | A * | 12/1996 | Prince | 702/150 |
| 5,736,974 | A | 4/1998 | Selker | 345/146 |
| 5,748,512 | A | 5/1998 | Vargas | 364/709.12 |
| 5,818,451 | A | 10/1998 | Bertram et al. | 345/354 |
| 5,896,321 | A | 4/1999 | Miller et al. | 365/189.01 |

(Continued)

FOREIGN PATENT DOCUMENTS

WO WO 98/33111 7/1998

(Continued)

OTHER PUBLICATIONS

Office Action dated Nov. 20, 2009, received in U.S. Appl. No. 11/620,641 (related).

(Continued)

*Primary Examiner* — Amr Awad
*Assistant Examiner* — Kenneth Bukowski
(74) *Attorney, Agent, or Firm* — Morgan, Lewis & Bockius LLP

(57) **ABSTRACT**

A portable electronic device having a touch screen display performs a set of operations, including displaying a plurality of key icons, each having an adjustable size hit region, and receiving a sequence of individual touch points input by a user on the touch screen display. The operations performed by the device further include processing the received individual touch points by: forming a user-input directed graph for the sequence of individual touch points received so far, determining a character corresponding to a last received individual touch point in accordance with the adjustable hit regions of the displayed key icons, displaying a sequence of characters corresponding to the sequence of individual touch points, and updating sizes of the adjustable hit regions for a plurality of the key icons in accordance with the sequence of individual touch points input by the user.

**35 Claims, 15 Drawing Sheets**