



US009411451B2

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

(10) **Patent No.:** **US 9,411,451 B2**
(45) **Date of Patent:** ***Aug. 9, 2016**

(54) **ELECTRONIC DEVICES WITH SIDEWALL DISPLAYS**

(71) Applicant: **Apple Inc.**, Cupertino, CA (US)

(72) Inventors: **Scott A. Myers**, San Francisco, CA (US); **Stephen Brian Lynch**, Portola Valley, CA (US); **Anthony S. Montevirgen**, San Francisco, 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 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **14/692,365**

(22) Filed: **Apr. 21, 2015**

(65) **Prior Publication Data**

US 2015/0227227 A1 Aug. 13, 2015

Related U.S. Application Data

(63) Continuation of application No. 14/602,199, filed on Jan. 21, 2015, which is a continuation of application No. 14/273,315, filed on May 8, 2014, now Pat. No. 8,976,141, which is a continuation of application No. 13/246,510, filed on Sep. 27, 2011, now Pat. No. 8,723,824.

(51) **Int. Cl.**
G06F 3/041 (2006.01)
H04M 1/02 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC **G06F 3/041** (2013.01); **G06F 1/1652** (2013.01); **G06F 3/044** (2013.01); **G06F 3/0412** (2013.01); **G06F 3/0488** (2013.01); **G06F 3/04817** (2013.01); **G06F 3/04886** (2013.01);

(Continued)

(58) **Field of Classification Search**
None

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,066,855 A 1/1978 Zenk
4,085,302 A 4/1978 Zenk et al.

(Continued)

FOREIGN PATENT DOCUMENTS

CN 2600861 Y 1/2004
CN 2840176 Y 11/2006

(Continued)

OTHER PUBLICATIONS

English machine translation of JP2007072902A.*

(Continued)

Primary Examiner — Nicholas Lee

(74) *Attorney, Agent, or Firm* — Treyz Law Group, P.C.; Kendall P. Woodruff

(57) **ABSTRACT**

Electronic devices may be provided that contain flexible displays that are bent to form displays on multiple surfaces of the devices. Bent flexible displays may be bent to form front side displays and edge displays. Edge displays may be separated from front side displays or from other edge displays using patterned housing members, printed or painted masks, or by selectively activating and inactivating display pixels associated with the flexible display. Edge displays may alternately function as virtual buttons, virtual switches, or informational displays that are supplemental to front side displays. Virtual buttons may include transparent button members, lenses, haptic feedback components, audio feedback components, or other components for providing feedback to a user when virtual buttons are activated.

21 Claims, 16 Drawing Sheets

