US008717199B2

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

(10) **Patent No.: US 8,717,199 B2**
(45) **Date of Patent: May 6, 2014**

(54) **CONFIGURABLE BUTTONS FOR ELECTRONIC DEVICES**

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

(72) Inventors: **John Benjamin Filson**, Mountain View, CA (US); **Stephen Brian Lynch**, Portola Valley, CA (US); **Emery Sanford**, San Francisco, CA (US); **Pinida Jan Moolsintong**, 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.

(21) Appl. No.: **13/909,919**

(22) Filed: **Jun. 4, 2013**

(65) **Prior Publication Data**

US 2013/0271302 A1 Oct. 17, 2013

Related U.S. Application Data

(63) Continuation of application No. 12/239,652, filed on Sep. 26, 2008, now Pat. No. 8,456,330.

(51) **Int. Cl.**
H03K 17/94 (2006.01)

(52) **U.S. Cl.**
USPC **341/20**

(58) **Field of Classification Search**
USPC 341/20
See application file for complete search history.

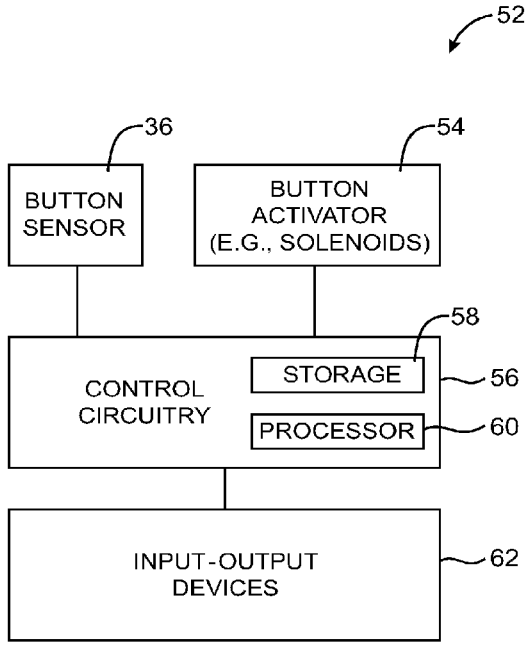
(56) **References Cited**

U.S. PATENT DOCUMENTS

3,772,684	A	11/1973	Scantlin
4,366,355	A	12/1982	Oelsch
7,166,791	B2	1/2007	Robbin et al.
7,312,785	B2	12/2007	Tsuk et al.
7,345,671	B2	3/2008	Robbin et al.
7,348,967	B2	3/2008	Zadesky et al.
7,654,147	B2	2/2010	Witte et al.
7,820,924	B2	10/2010	Stilley et al.
2003/0006892	A1	1/2003	Church
2008/0251364	A1	10/2008	Takala et al.
2008/0280657	A1	11/2008	Maenpaa et al.
2009/0107737	A1	4/2009	Reynolds et al.

Primary Examiner — Stephen W Jackson
Assistant Examiner — Dru Parries
(74) *Attorney, Agent, or Firm* — Brownstein Hyatt Farber Schreck, LLP

(57) **ABSTRACT**

Configurable buttons for electronic devices such as portable electronic devices are provided. A configurable button may have a button member that moves relative to a device housing when it is desired to activate a switch. The button may have an associated touch sensor. The touch sensor may detect when a user's finger touches a particular portion of the button member. Contact with only this portion of the button member is generally inadvertent, so an actuator may be used to prevent or otherwise restrict motion of the button relative to a device housing. This prevents inadvertent activation of the button when a user is manipulating portions of an electronic device such as clip or lid, but does not intend to depress the button.

18 Claims, 14 Drawing Sheets