



US 20070229455A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0229455 A1**

**Martin et al.** (43) **Pub. Date: Oct. 4, 2007**

(54) **METHOD AND APPARATUS FOR PROVIDING TACTILE SENSATIONS**

(60) Provisional application No. 60/335,493, filed on Nov. 1, 2001. Provisional application No. 60/399,883, filed on Jul. 31, 2002.

(75) Inventors: **Kenneth M. Martin**, Los Gatos, CA (US); **Steven P. Vassallo**, Redwood City, CA (US); **Alex S. Goldenberg**, Portola Valley, CA (US); **Alexander Jasso**, Los Altos, CA (US); **Kollin Tierling**, Milpitas, CA (US)

**Publication Classification**

(51) **Int. Cl.**  
**G09G 5/00** (2006.01)  
(52) **U.S. Cl.** ..... **345/156**  
(57) **ABSTRACT**

Correspondence Address:  
**PATENT DEPARTMENT (51851)**  
**KILPATRICK STOCKTON LLP**  
**1001 WEST FOURTH STREET**  
**WINSTON-SALEM, NC 27101 (US)**

Products and processes for providing tactile sensations to input devices or electronic devices are provided. Input devices include mechanical input devices (such as, for example, mechanical switches) and non-mechanical input devices (such as, for example, touchpads). Tactile feedback is provided by using an actuator or other means in communication with the input device or electronic device. A controller may be employed to receive signals from the input devices and control the actuator. Tactile feedback to an input device or electronic device may be provided in response to one or more events or situations. Such an event or situation may be any one designated. Examples of such events and situations include the level of pressure placed on an input device; the availability or lack of availability of a function associated with an input device; and the function, menu, or mode of operation associated with an input device's activation. A variety of feedback types and combinations may be selected.

(73) Assignee: **IMMERSSION CORPORATION**, San Jose, CA (US)

(21) Appl. No.: **11/693,117**

(22) Filed: **Mar. 29, 2007**

**Related U.S. Application Data**

(63) Continuation of application No. 10/285,450, filed on Nov. 1, 2002.

