



US006831628B1

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

(10) **Patent No.:** **US 6,831,628 B1**
(45) **Date of Patent:** **Dec. 14, 2004**

(54) **INPUT DEVICE OFF TABLE SWITCH**

FOREIGN PATENT DOCUMENTS

(75) Inventors: **Abraham S. Farag**, E. Palo Alto, CA (US); **Bartley K. Andre**, Menlo Park, CA (US); **Benjamin B. Lyon**, Kensington, CA (US); **Richard D. Cappels, Sr.**, San Jose, CA (US); **Jeffrey B. Doar**, Fremont, CA (US)

JP 02001142636 A * 5/2001 G06F/3/033

* cited by examiner

Primary Examiner—Matthew C. Bella

Assistant Examiner—Tam Tran

(74) *Attorney, Agent, or Firm*—Blakely, Sokoloff, Taylor & Zafman LLP

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

(57) **ABSTRACT**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 171 days.

According to one aspect of the invention, a movable cursor control device is provided for controlling a cursor on a display screen of a digital processing system. One exemplary cursor control device comprises a housing, an electromagnetic emitting device coupled to the housing, and an electromagnetic detector coupled to the housing. The electromagnetic detector detects reflections of signals emitted from the electromagnetic emitting device and determines when the housing has been lifted from a surface. In another aspect of the invention, an exemplary method is provided for controlling a cursor on a display screen of a digital processing system. The exemplary method includes holding the cursor relative to an object on the display screen using a cursor control device activated by a user, detecting that the user no longer activates the cursor control device, and detecting that the user has lifted the cursor control device from a surface when the cursor control device is no longer activated by the user. Further, the method allows for continuing to hold the cursor relative to the object after detecting that the user no longer activates the cursor control device.

(21) Appl. No.: **09/675,630**

(22) Filed: **Sep. 29, 2000**

(51) **Int. Cl.**⁷ **G09G 5/08**

(52) **U.S. Cl.** **345/157; 345/158; 345/159; 345/160; 345/161; 345/162; 345/163; 345/164; 345/165; 345/166**

(58) **Field of Search** 345/157–165

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,673,066 A	*	9/1997	Toda et al.	345/157
5,994,710 A	*	11/1999	Knee et al.	250/557
6,040,820 A		3/2000	Choi	345/156
6,147,679 A		11/2000	Numata et al.	345/163

32 Claims, 7 Drawing Sheets

