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United States Patent [19]

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Buxton et al.

[45] **Date of Patent:** **Jul. 25, 2000**

[54] **GRAPHICAL KEYBOARD**

[75] Inventors: **William A. S. Buxton**, Toronto, Canada; **Gordon P. Kurtenbach**, Mountain View, Calif.

[73] Assignee: **Xerox Corporation**, Stamford, Conn.

[21] Appl. No.: **08/443,259**

[22] Filed: **May 17, 1995**

Related U.S. Application Data

[63] Continuation of application No. 08/171,288, Dec. 21, 1993, abandoned.

[51] **Int. Cl.**⁷ **G09G 5/00**

[52] **U.S. Cl.** **345/358; 345/168; 345/179; 341/22**

[58] **Field of Search** 345/156, 157, 345/168, 169, 170, 172, 173, 174, 175, 176, 179, 180, 181, 182, 183; 341/22, 23; 170/18, 19; 395/326, 335, 347, 350, 351, 352; 382/188, 189

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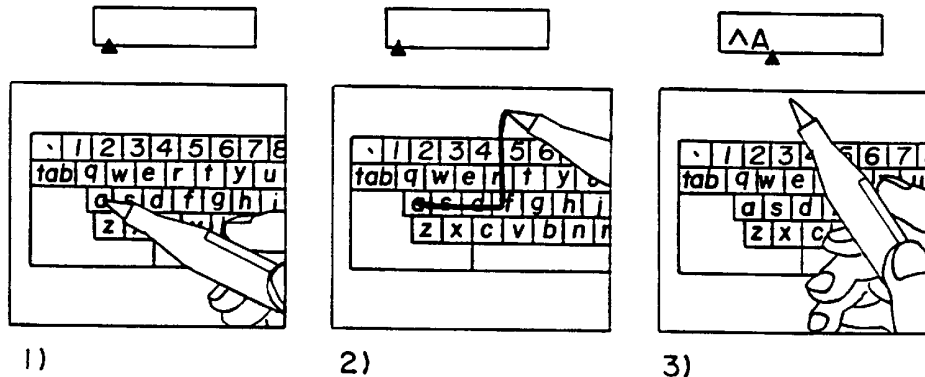
Primary Examiner—Steven Saras

Attorney, Agent, or Firm—Townsend & Townsend Crew LLP

[57] **ABSTRACT**

A system and method for a graphical keyboard that benefits from the expressive power and intuitive ease of use associated with pen strokes and gestures, yet does not require complex character-recognition software. The graphical keyboard responds differently to different kinds of pen strokes. For example, lowercase "a" is entered by tapping a stylus on the "a" key of the graphical keyboard. Uppercase "A" is entered by an upward stroke initiated over the "a" key. Likewise, by stroking in other directions, a user can express other modifiers to the basic character, such as "control", "alt", "command," etc. Also, strokes in distinct directions can be used to express space, backspace, delete, and return characters, for example. Multiple strokes can be applied in sequence to a single key to express multiple modifiers. Visual feedback of pen strokes can be provided in the form of marks made by the pen. Pop-up menus can be used to provide help with and to facilitate memorization of command strokes and stroke sequences. The graphical keyboard thus lets the expert user proceed by "feel," and prompts the novice user when and as necessary.

18 Claims, 20 Drawing Sheets



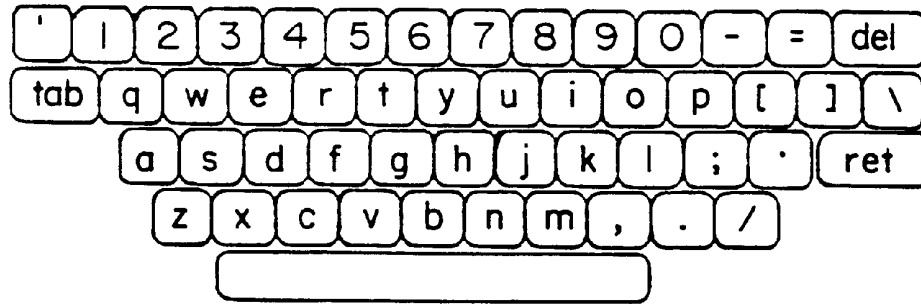


FIG. 1.

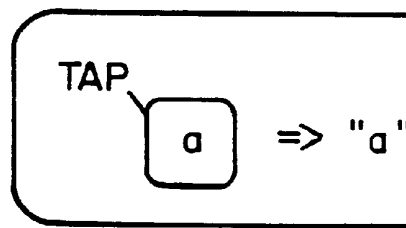


FIG. 2.

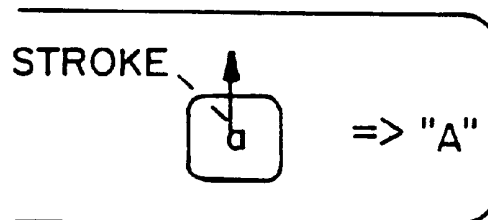


FIG. 3.

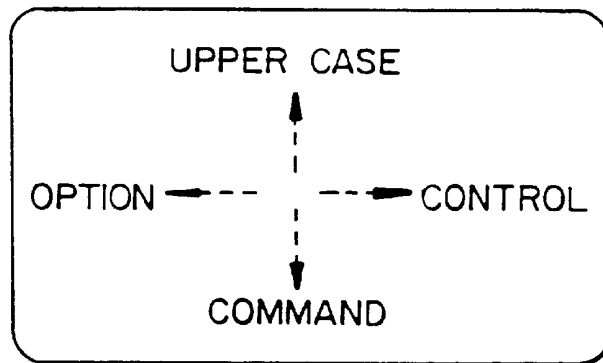


FIG. 4.

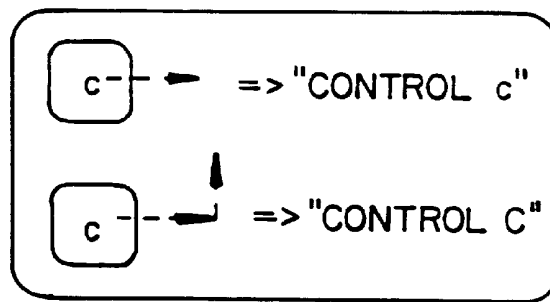


FIG. 5.

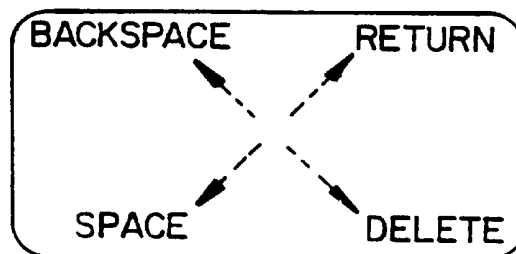


FIG. 6.

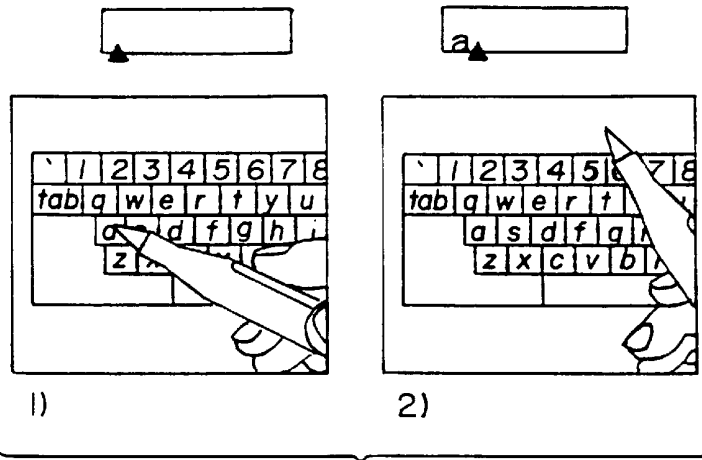


FIG. 7.

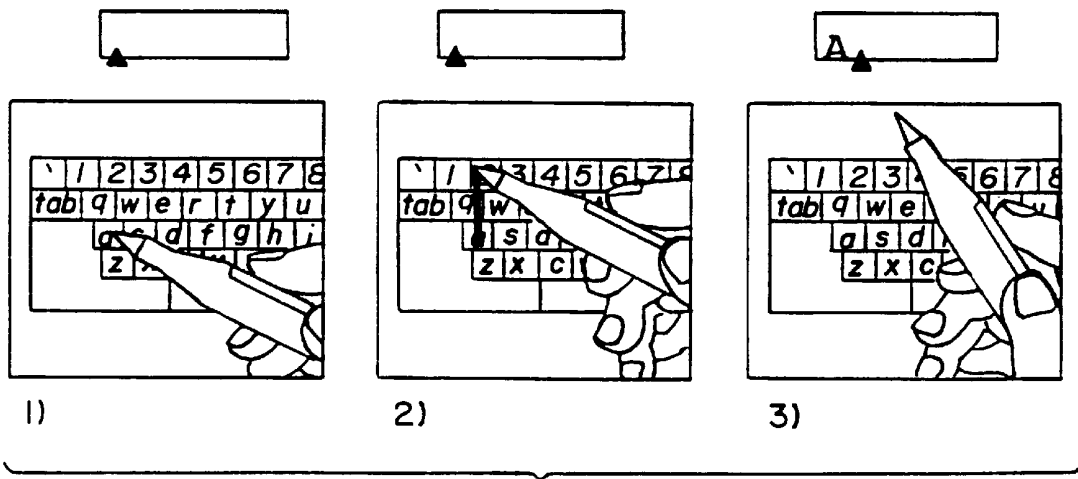


FIG. 8.

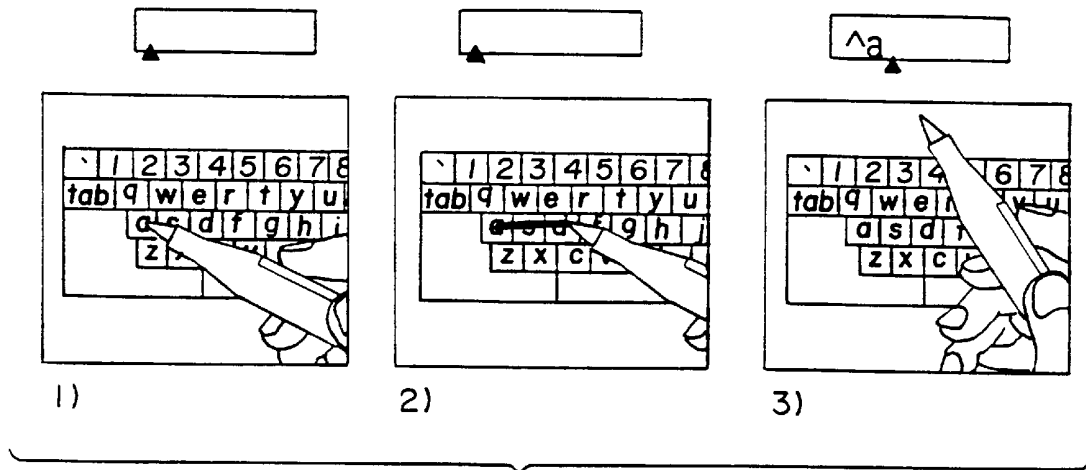


FIG. 9.

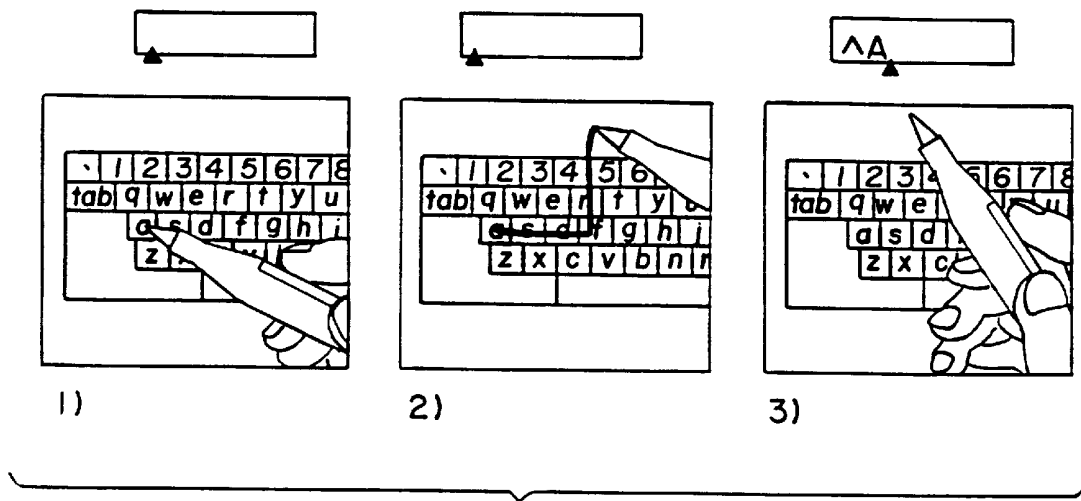


FIG. 10.

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