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# United States Patent [19]

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West et al.

[45] Date of Patent: **Nov. 3, 1998**

- [54] **COMPUTER INPUT DEVICE FOR USE IN CONJUNCTION WITH A MOUSE INPUT DEVICE**
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- [73] Assignee: **Tanisys Technology, Inc.**, Austin, Tex.
- [21] Appl. No.: **653,589**
- [22] Filed: **May 24, 1996**
- [51] Int. Cl.<sup>6</sup> ..... **G09G 5/00**
- [52] U.S. Cl. .... **345/163; 345/174; 345/156**
- [58] Field of Search ..... **345/156-158, 345/163-166, 173, 174; 248/918**

Primary Examiner—Steven J. Saras  
Assistant Examiner—Vincent Kovalick

[57] **ABSTRACT**

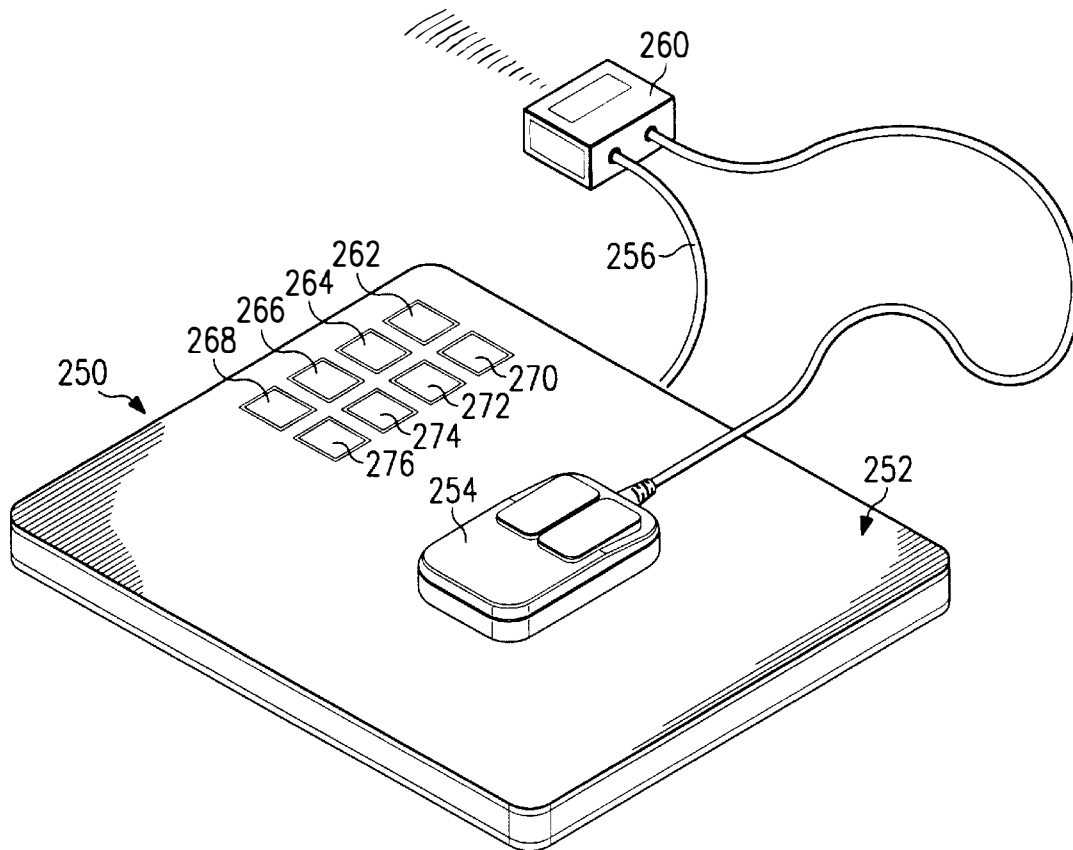
A computer input device is used in conjunction with a mouse input device. The computer input device of the invention comprises a body having a resilient layer covered by a surface layer textured throughout the entirety of the surface for operation of the mouse. A printed circuit card is incorporated in the body between the resilient layer and the upper surface layer and includes a plurality of capacitive touch sensor pads. The card further includes electronic circuitry for operating the touch sensor pads to detect when a capacitive object, such as a fingertip, is in the proximity of a sensor pad. A touch need not apply force to register. The printed circuit card includes a guard ring pad surrounding the touch pads which detects the presence of the mouse over the sensor pads and indicates that any detected outputs from the sensor pads are not valid, but instead are due to the presence of the mouse. The mouse can operate over the entirety of the surface of the device without interruption, including over the capacitive sensor pads. The input device can be connected to a personal computer through a mouse port, a keyboard port, a universal serial bus or any other available port of the computer. Other computer system components, such as a keyboard or mouse, can be connected directly or indirectly through this input device.

[56] **References Cited**

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**27 Claims, 6 Drawing Sheets**



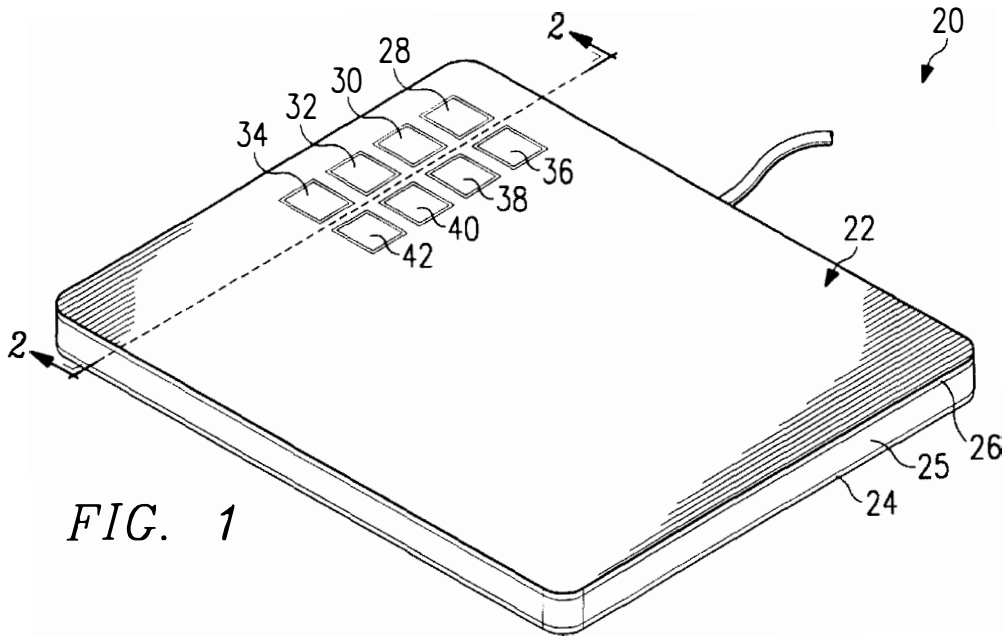


FIG. 1

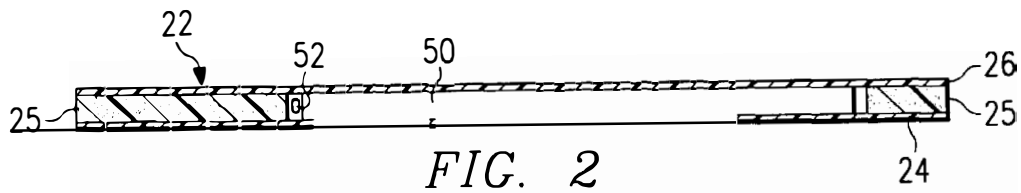


FIG. 2

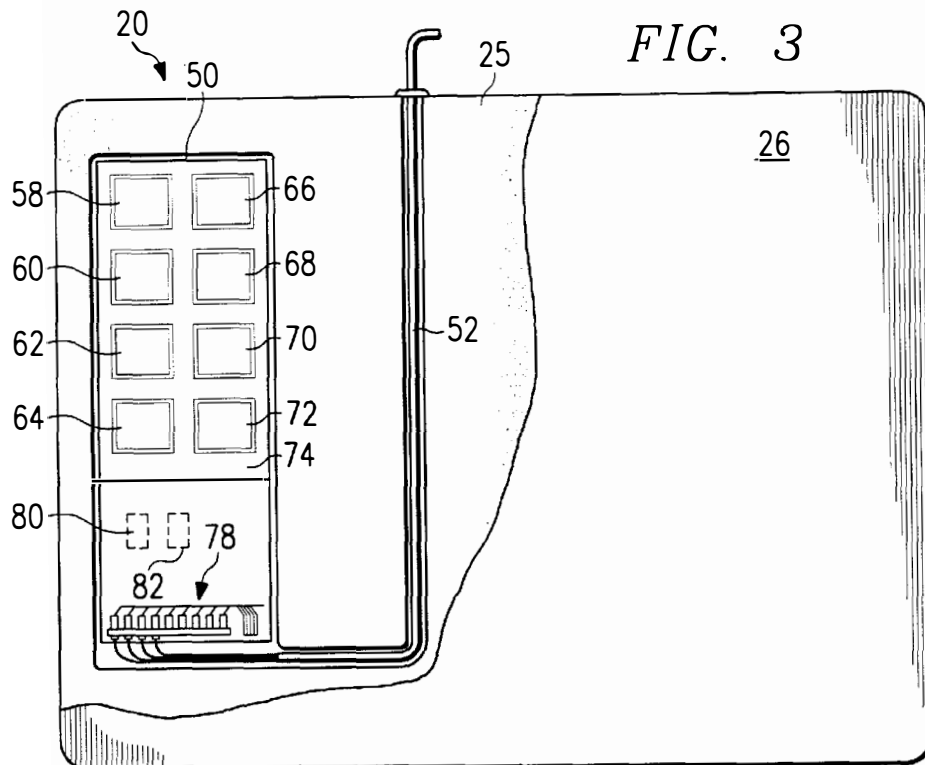


FIG. 3

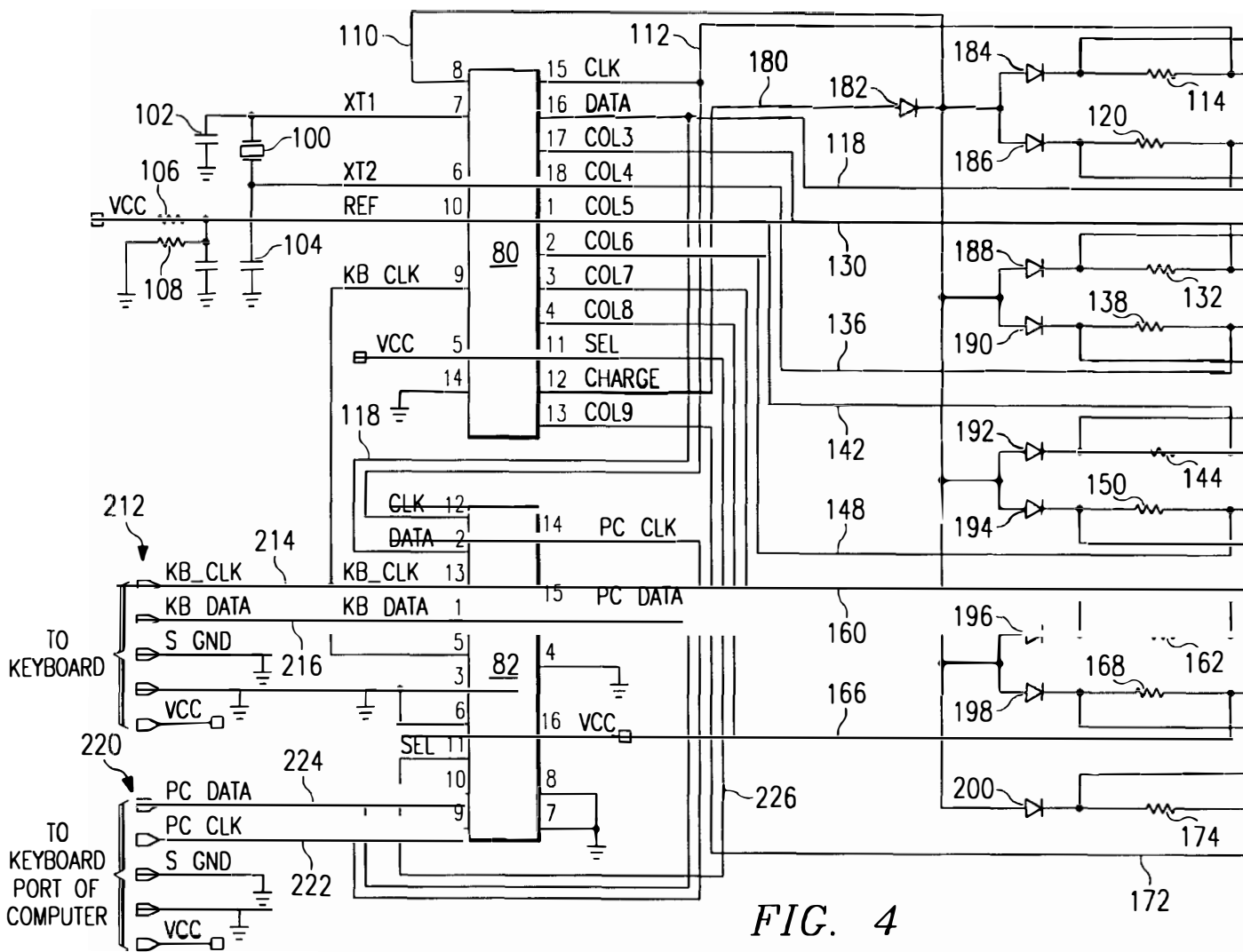


FIG. 4

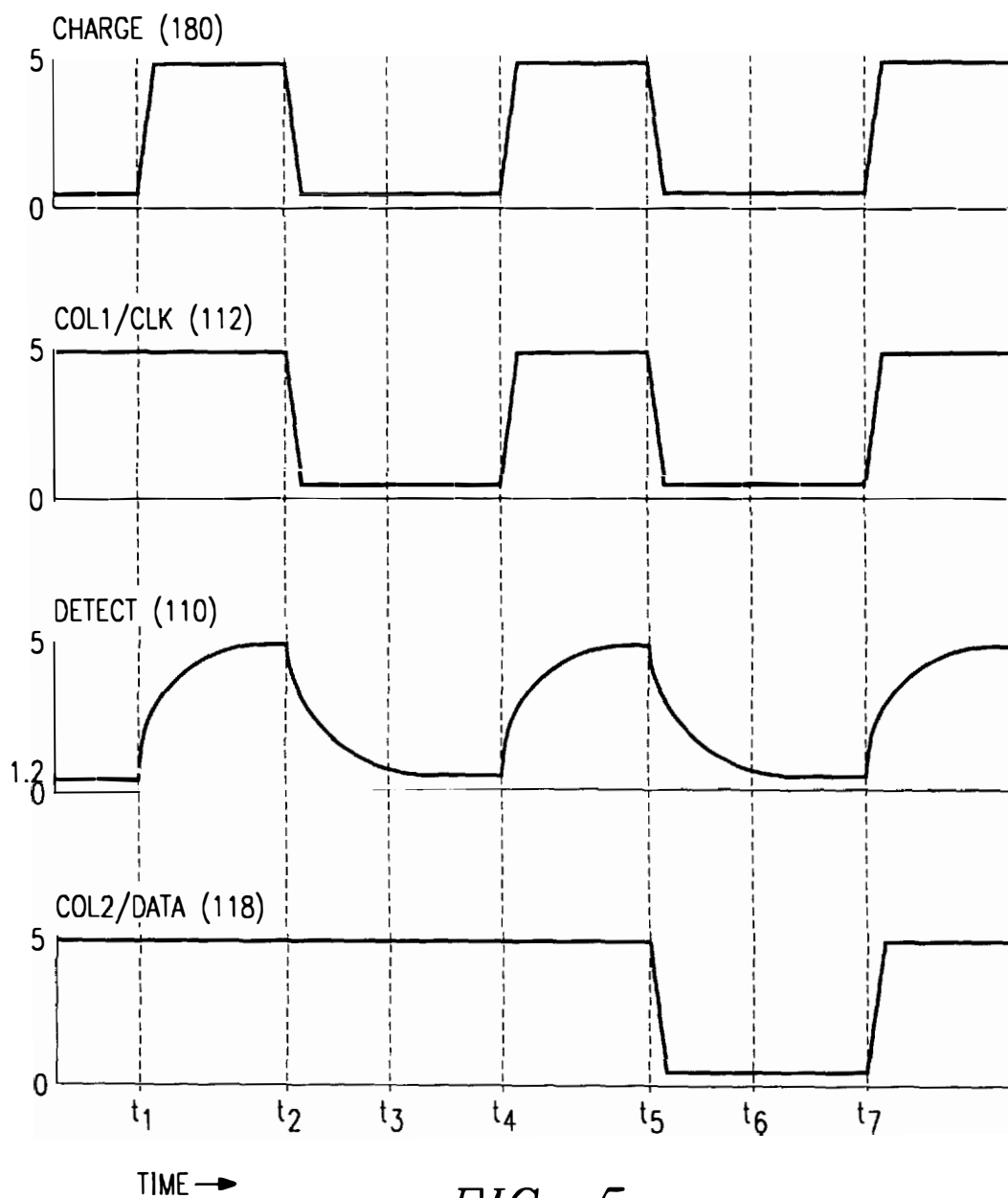


FIG. 5

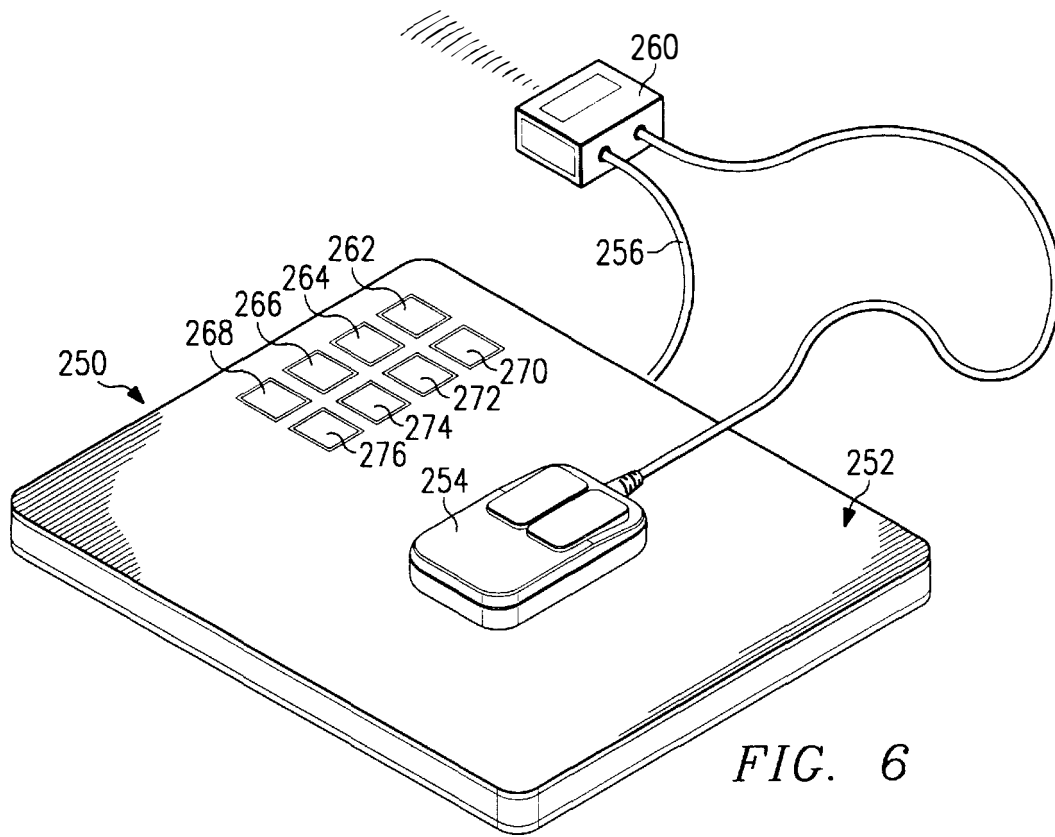


FIG. 6

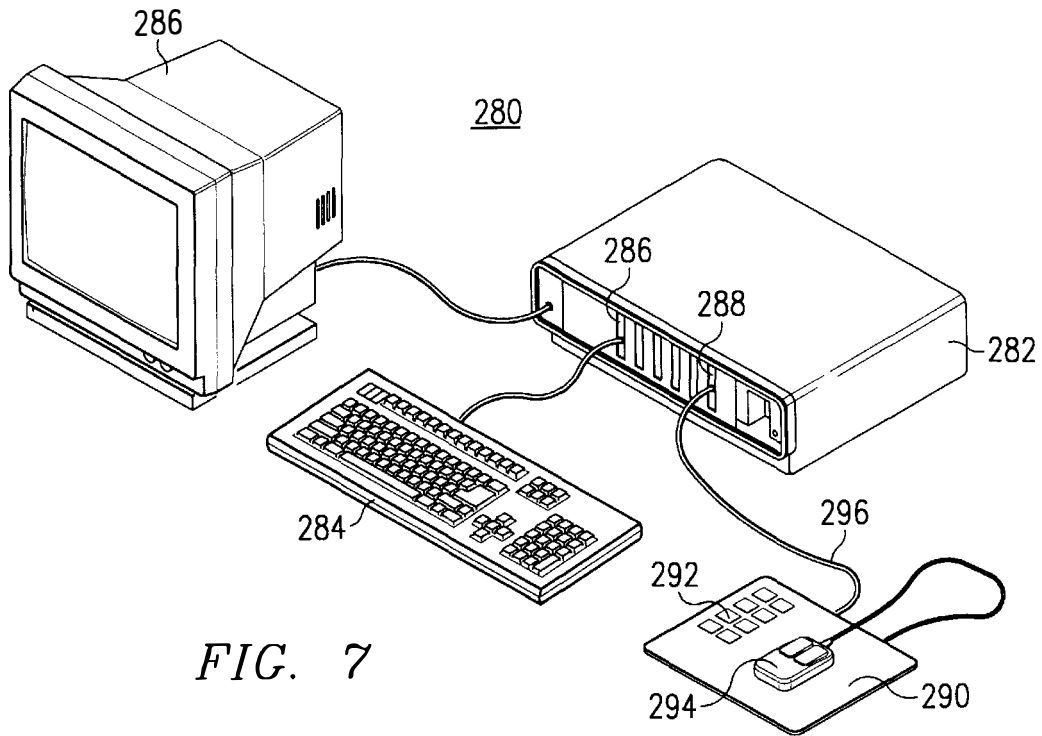


FIG. 7

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