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(54) **HAPTIC INTERFACE FOR LAPTOP  
COMPUTERS AND OTHER PORTABLE  
DEVICES**

provisional application No. 60/274,444, filed on Mar.  
9, 2001.

**Publication Classification**

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(57) **ABSTRACT**

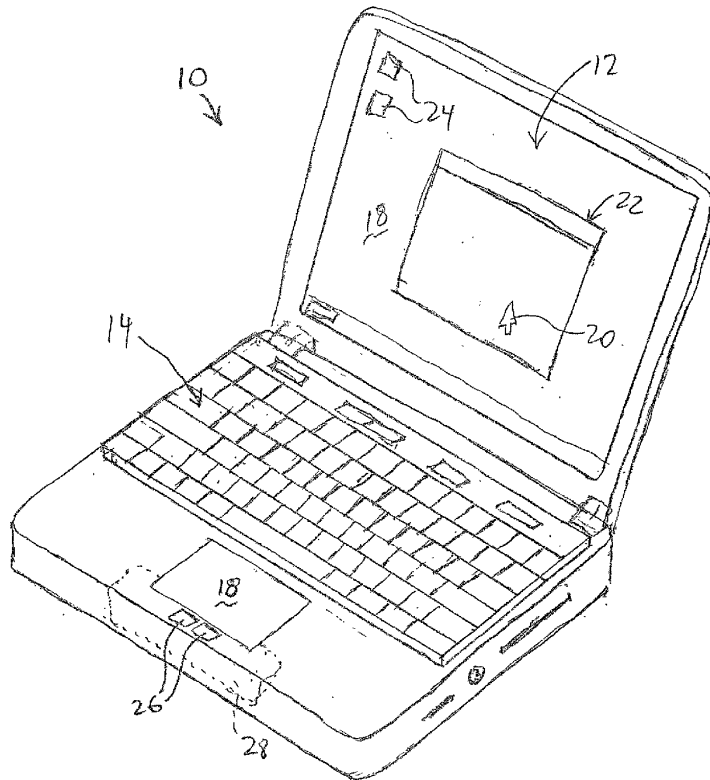
A haptic feedback touch control used to provide input to a computer. A touch input device includes a planar touch surface that provides position information to a computer based on a location of user contact. The computer can position a cursor in a displayed graphical environment based at least in part on the position information, or perform a different function. At least one actuator is also coupled to the touch input device and outputs a force to provide a haptic sensation to the user. The actuator can move the touchpad laterally, or a separate surface member can be actuated. A flat E-core actuator, piezoelectric actuator, or other types of actuators can be used to provide forces. The touch input device can include multiple different regions to control different computer functions.

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**Related U.S. Application Data**

(63) Continuation-in-part of application No. 09/487,737,  
filed on Jan. 19, 2000, which is a non-provisional of



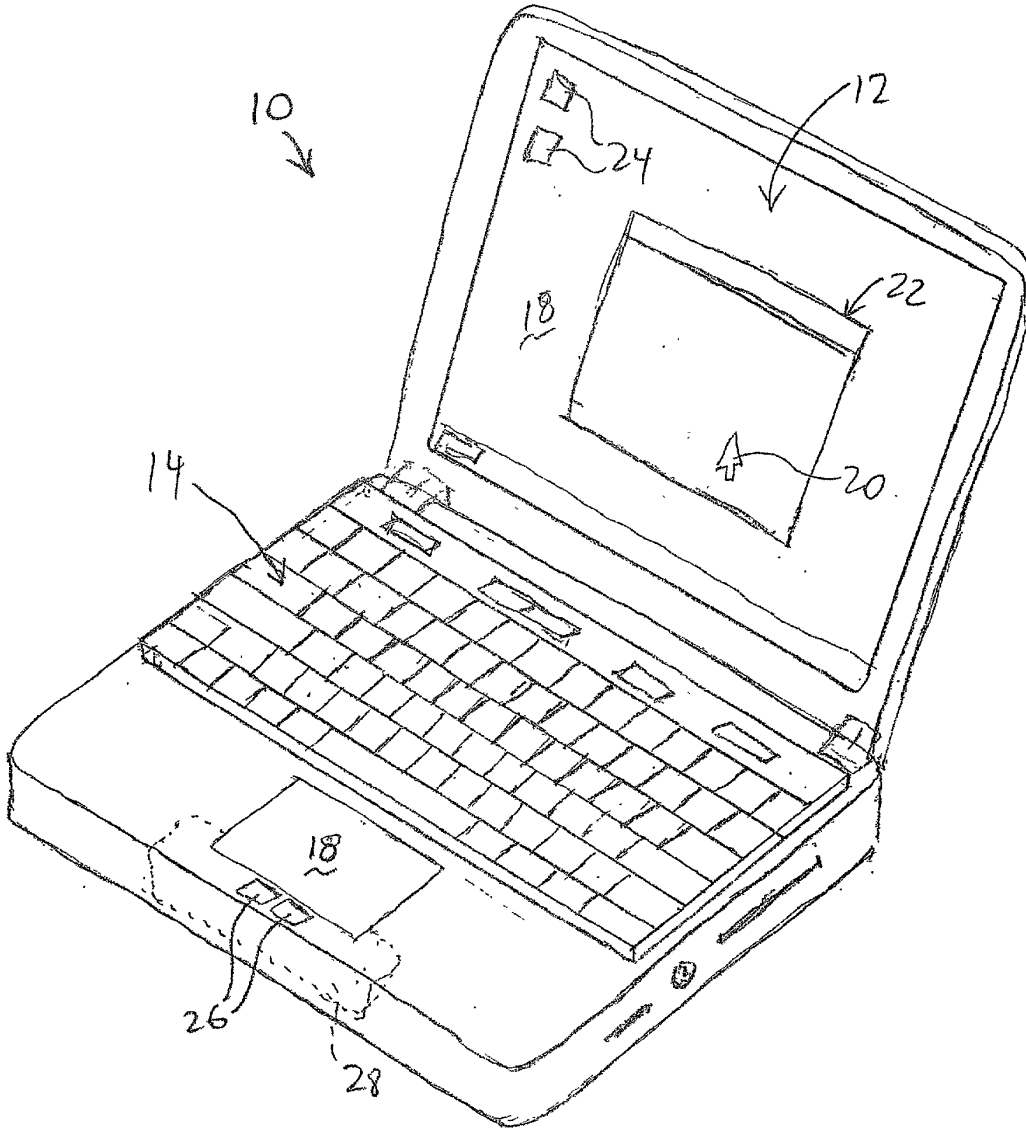
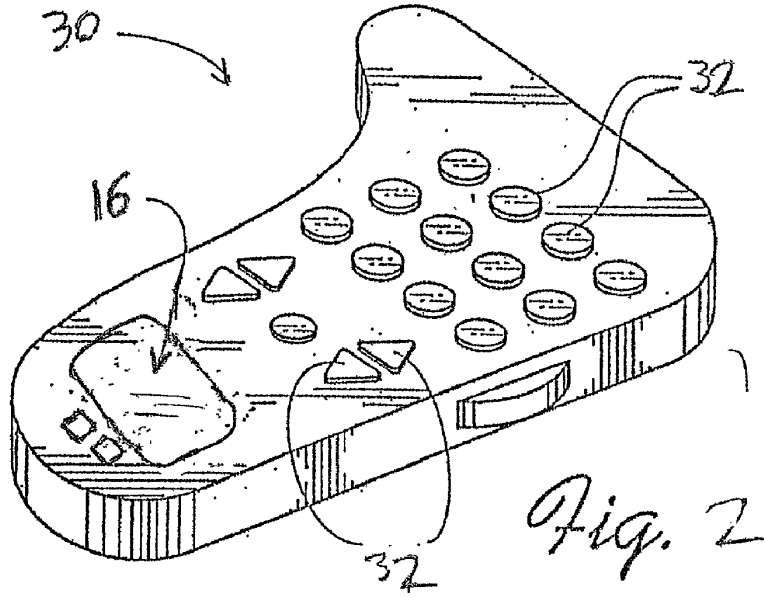


FIG. 1



*Fig. 2*

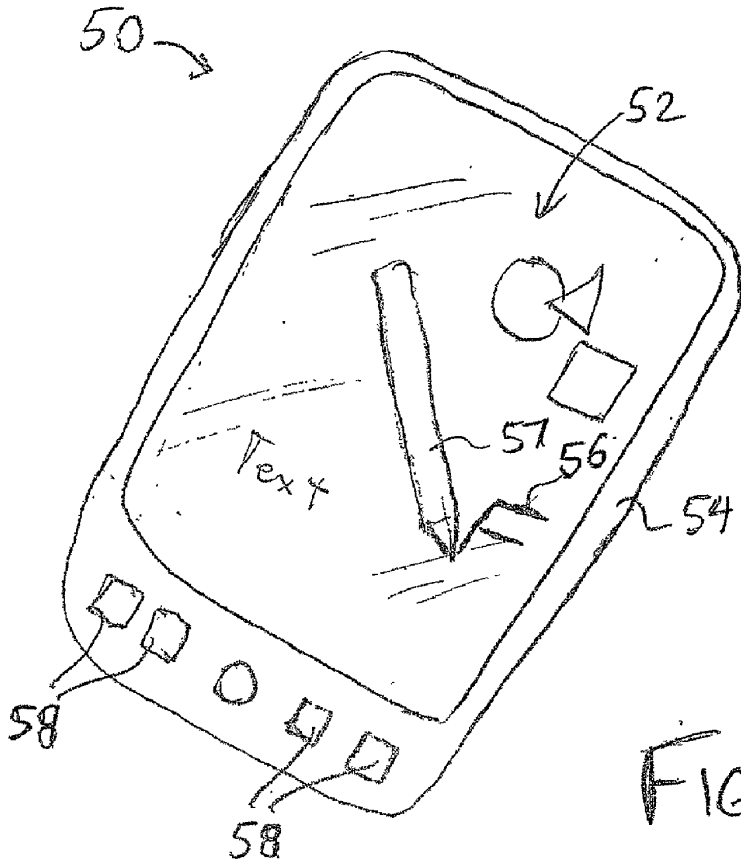


FIG. 3

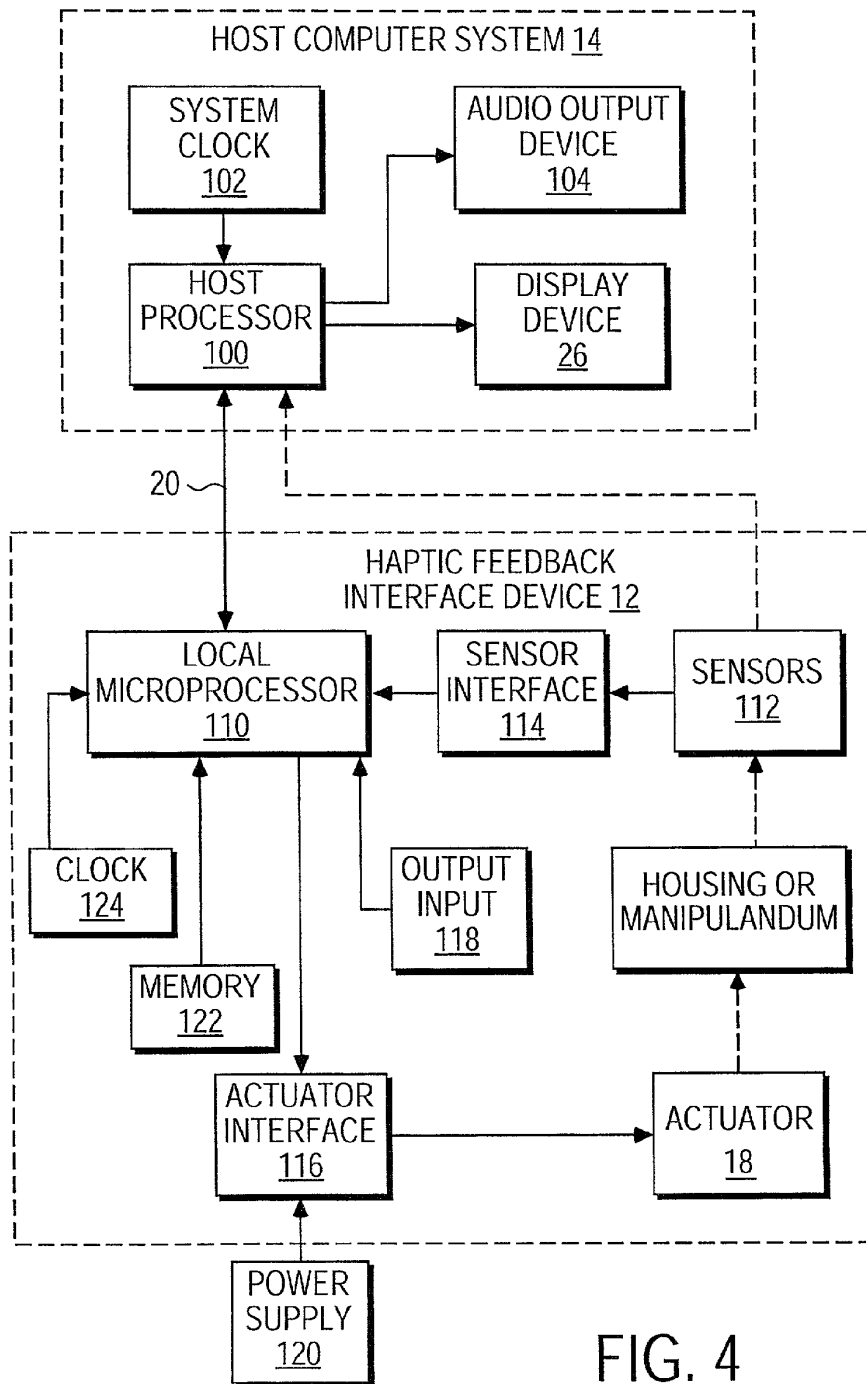


FIG. 4

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