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Liberty**

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(54) **3D POINTING DEVICES WITH
ORIENTATION COMPENSATION AND
IMPROVED USABILITY**

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patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

This patent is subject to a terminal dis-
claimer.

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G09G 5/00 (2006.01)
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(52) **U.S. Cl.** **345/158**; 345/156; 345/157;
345/163

(58) **Field of Classification Search** 345/156-169,
345/173-179; 178/18.01-18.07, 19.01-19.06
See application file for complete search history.

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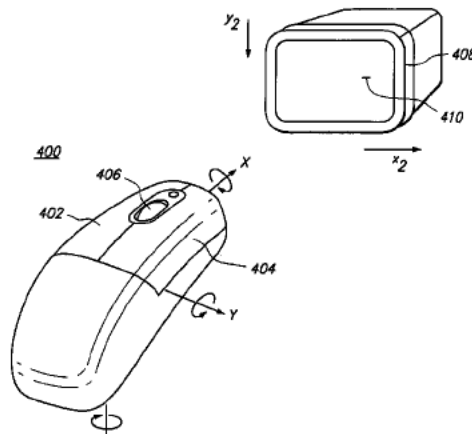
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(57) **ABSTRACT**

Systems and methods according to the present invention
describe 3D pointing devices which enhance usability by
transforming sensed motion data from a first frame of
reference (e.g., the body of the 3D pointing device) into a
second frame of reference (e.g., a user's frame of reference).
One exemplary embodiment of the present invention
removes effects associated with a tilt orientation in which the
3D pointing device is held by a user.

17 Claims, 9 Drawing Sheets



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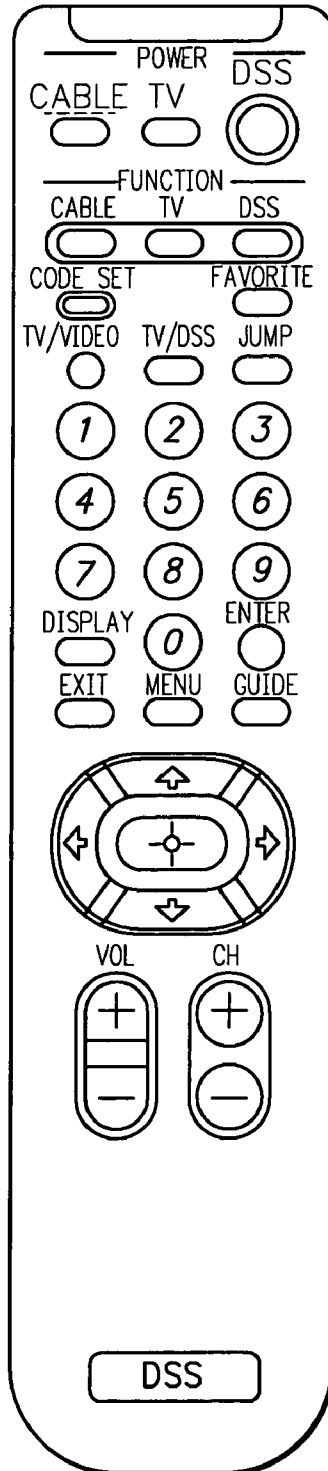
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FIG. 1

(Prior Art)



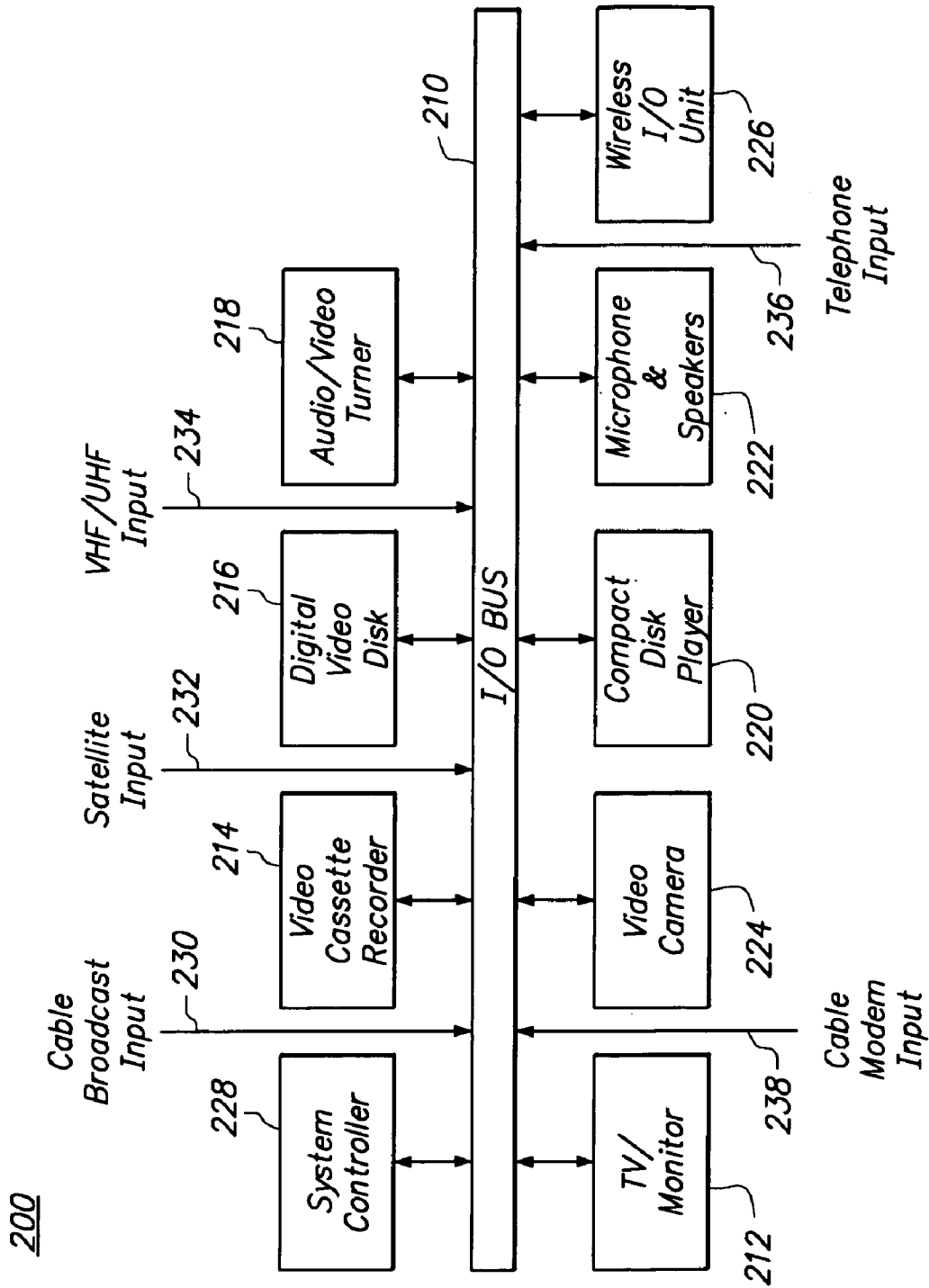
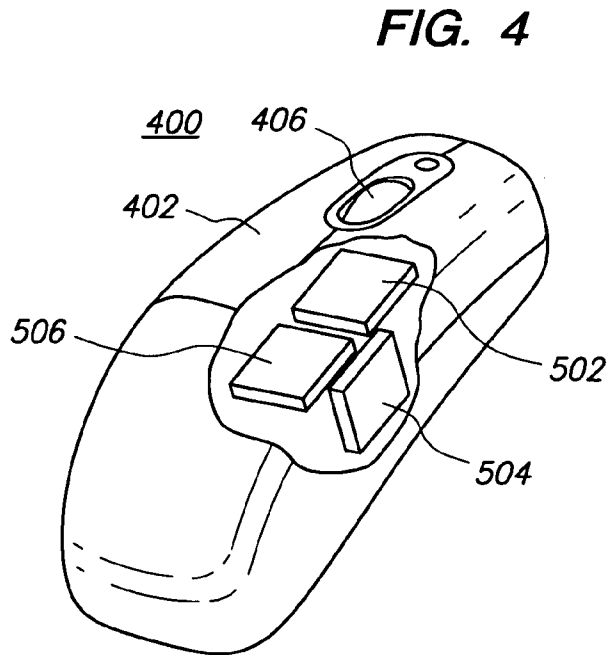
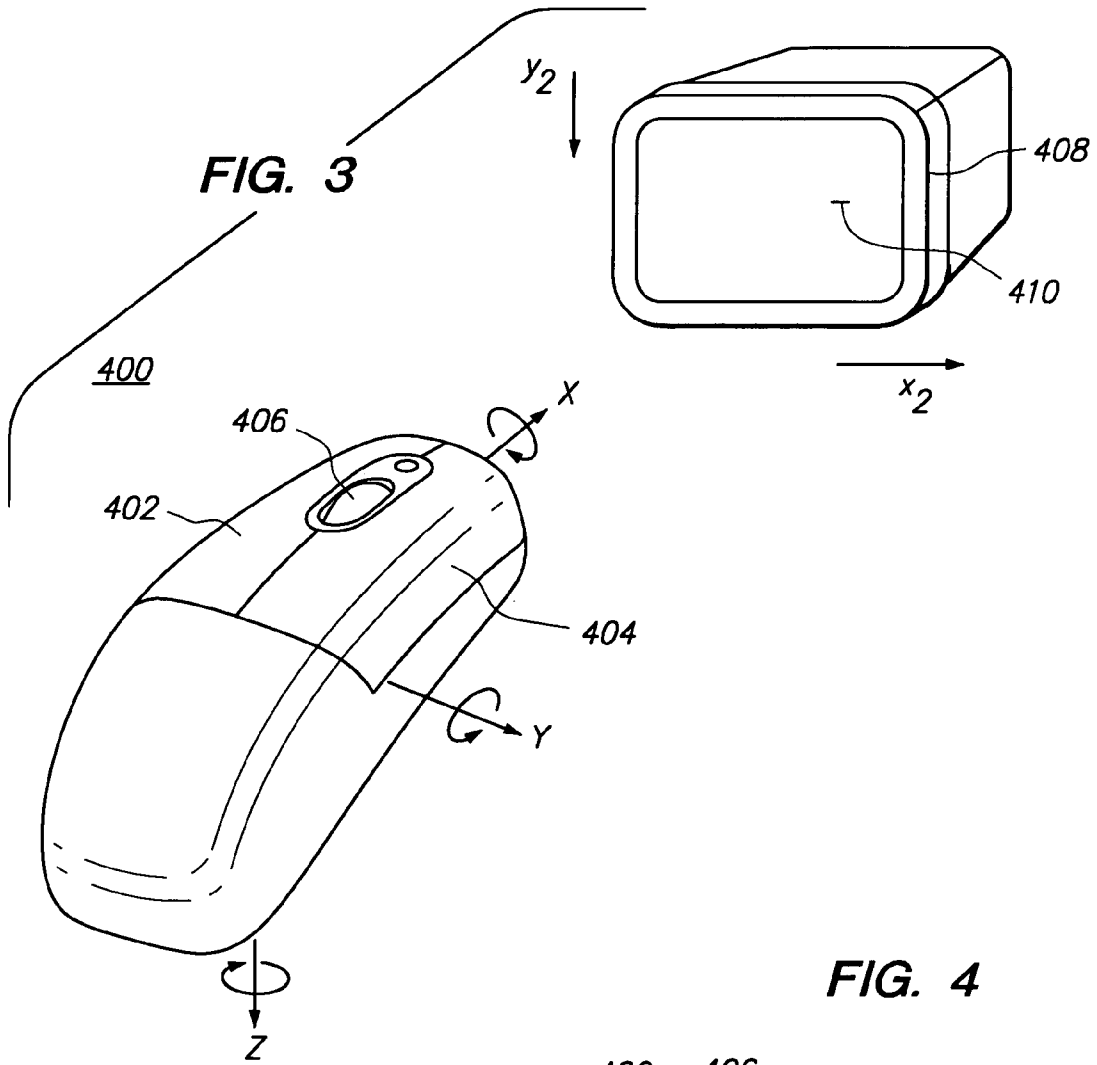


FIG. 2



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