

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

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(54) **APPARATUS AND METHOD FOR TOUCH SCREEN INTERACTION BASED ON TACTILE FEEDBACK AND PRESSURE MEASUREMENT**

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(73) Assignee: **Sony Corporation**, Tokyo (JP)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 763 days.

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Assistant Examiner — Dmitriy Bolotin

(65) **Prior Publication Data**

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(30) **Foreign Application Priority Data**

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(57) **ABSTRACT**

(51) **Int. Cl.**
G06F 3/041 (2006.01)
 (52) **U.S. Cl.** 345/173; 715/701
 (58) **Field of Classification Search** 345/173-178;
 178/18.01-18.11, 19.01-19.07, 20.01-20.04;
 715/700-702
 See application file for complete search history.

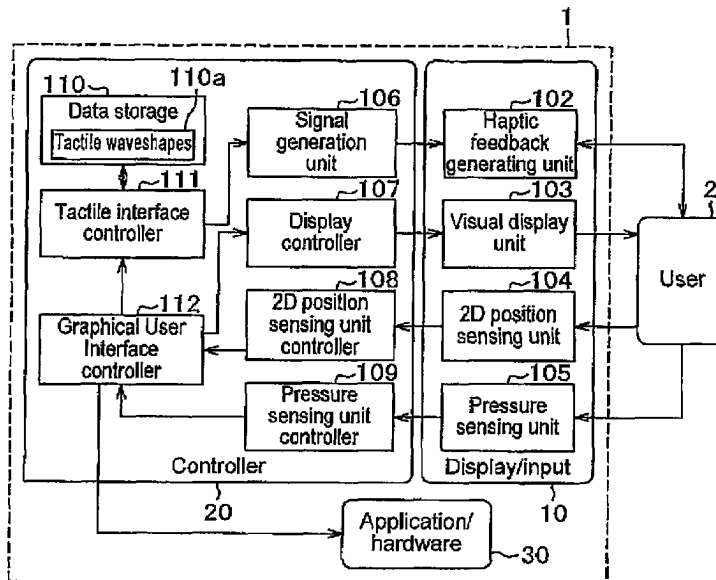
An apparatus includes a display section with a touch screen, and the touch screen is adapted to display at least one graphical user interface object and detect a touch position on the touch screen. The apparatus has a haptic feedback generating unit attached to the touch screen and is adapted to generating haptic feedback. A pressure sensing unit is attached to the touch screen and adapted to detect pressure applied to the touch screen. A controller section is adapted to control and drive the display section. The graphical user interface object displayed on the touch screen has a plurality of logical states. The controller section determines a current logical state of the graphical user interface object and a form of the haptic feedback to be generated depending on the detected touch position.

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18 Claims, 11 Drawing Sheets



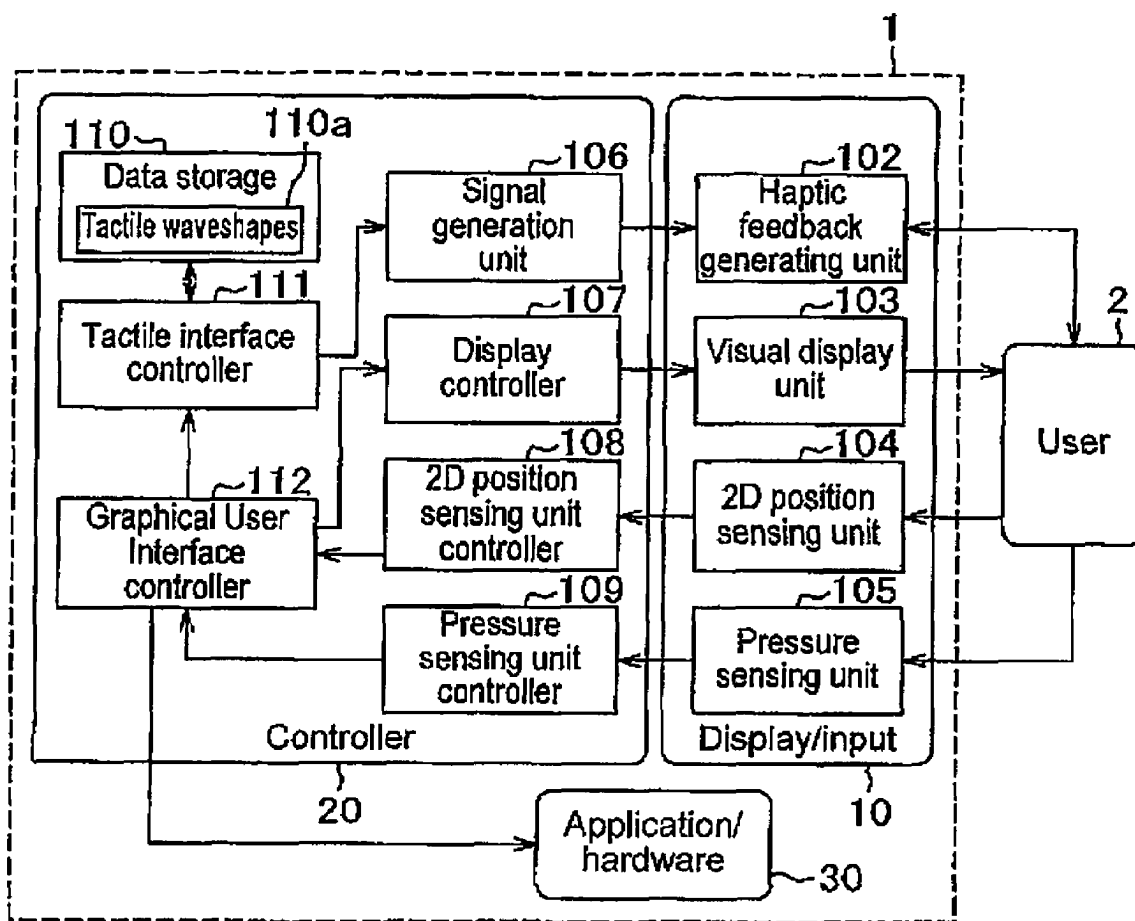


Figure 1

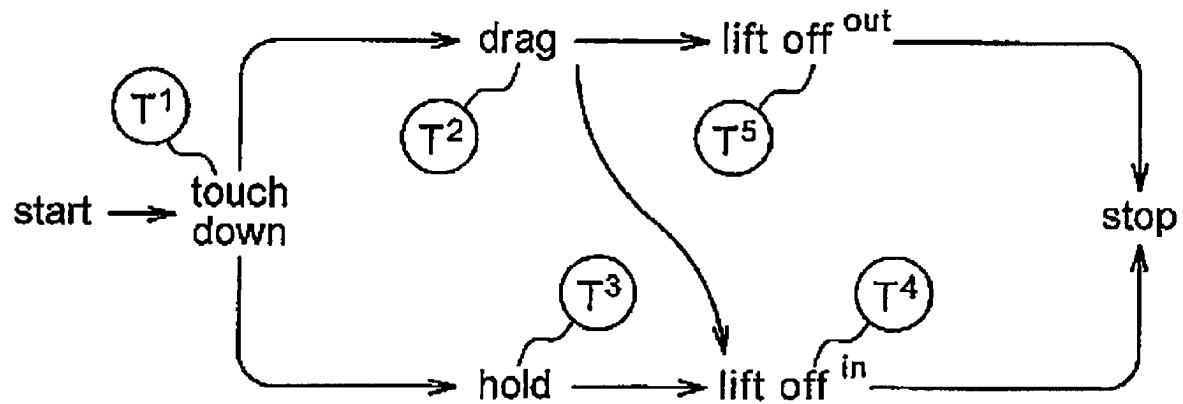


Figure 2

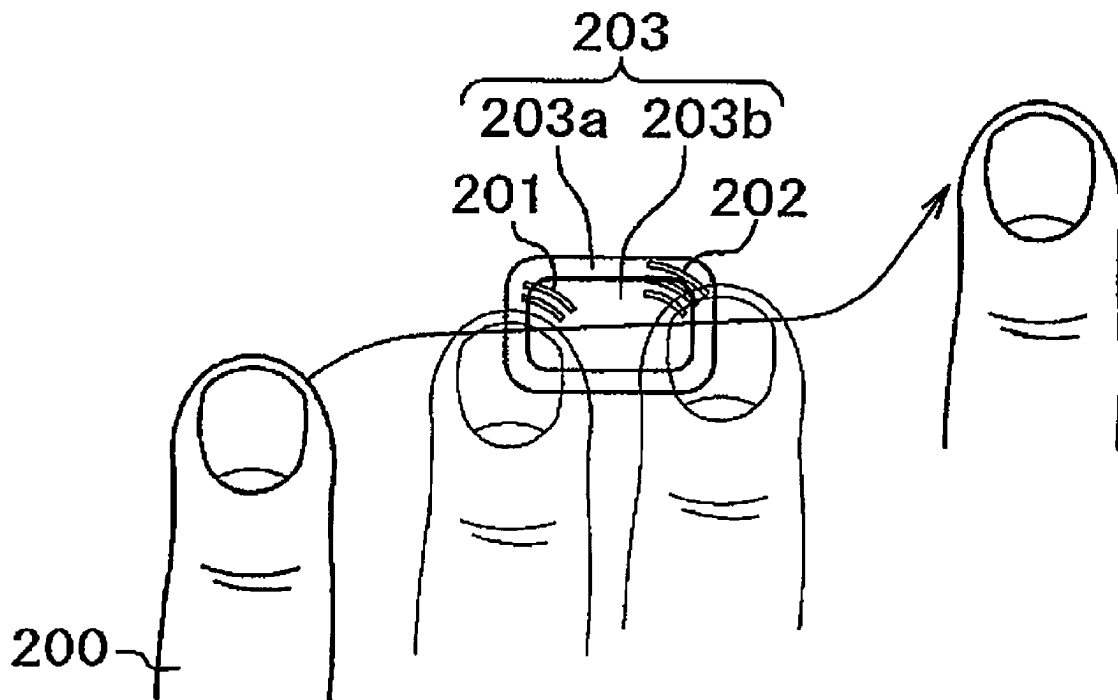


Figure 3

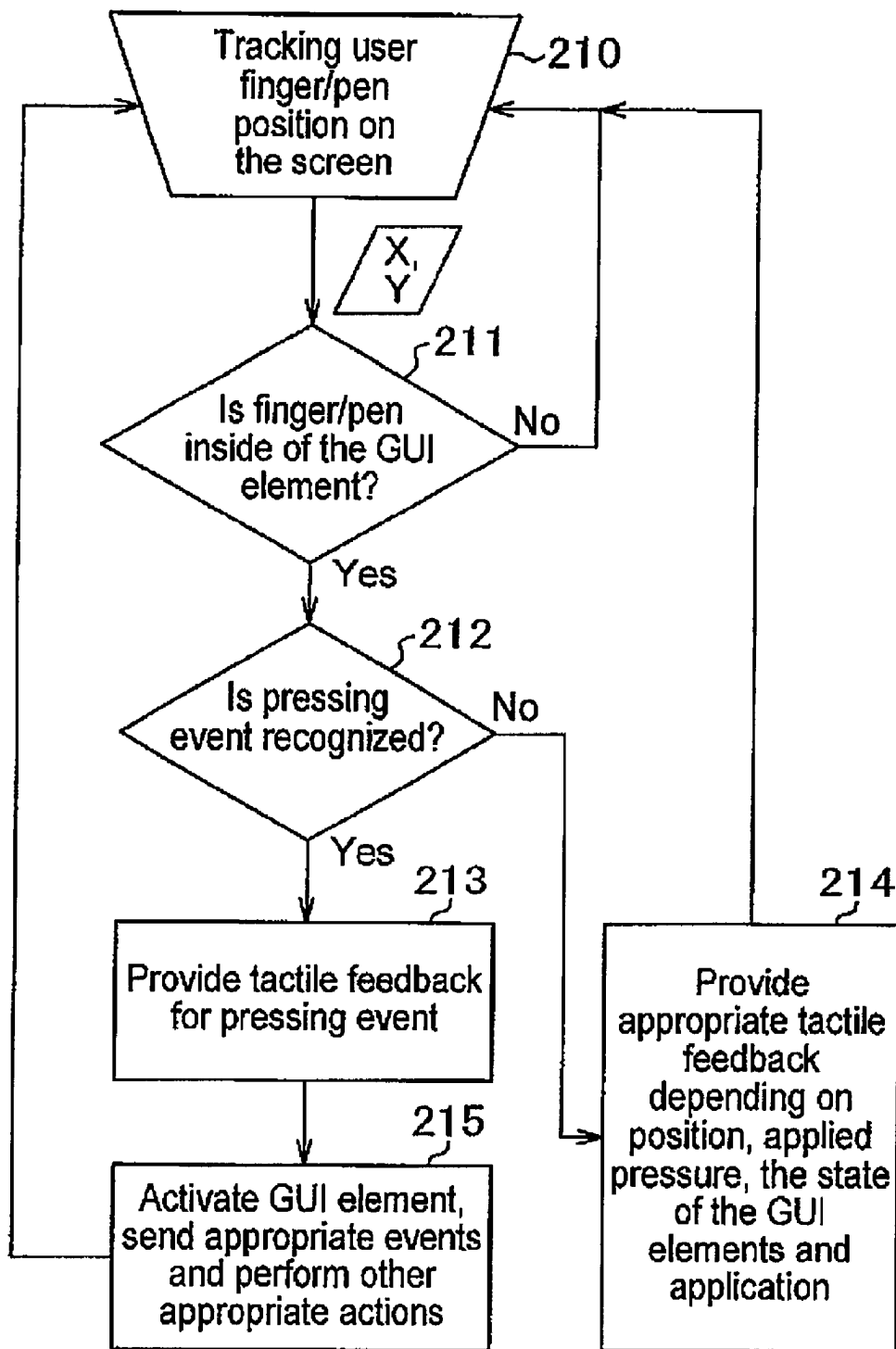


Figure 4

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