

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner : Abbas I. Abdulsalam
Art Unit : 2629
Inventor : Timothy R. Pryor
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For : MULTIPOINT, VIRTUAL CONTROL, AND FORCE BASED
TOUCH SCREEN APPLICATIONS
Attorney Docket No. : 135873.136839-US

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE

Responsive to the Official Action mailed March 3, 2011, the period for response being until June 3, 2011, please amend the above identified patent application as set forth on the following pages.

CLAIMS

1. through 3. (Canceled)

4. (Previously Presented) A touch interface comprising:

a display screen including a front surface and a rear surface and adapted to display visually observable data;

a sensor circuit adapted to identify a characteristic of a touch input on the front surface of the display screen; and

a force element responsive to the sensor circuit and adapted to excite the display screen rear surface by generating a force feedback signal in response to the characteristic of the touch input.

5. (Previously Presented) The touch interface of claim 4 wherein:

the force feedback signal includes a frequency; and

the frequency is selected as a function of at least the characteristic of the touch input.

6. (Previously Presented) The touch interface of claim 4 wherein:

the force feedback signal includes an intensity; and

the intensity is selected as a function of at least the characteristic of the touch input.

7. (Previously Presented) The touch interface of claim 4 wherein:

the force feedback signal includes a pulse sequence; and

the pulse sequence is selected as a function of at least the characteristic of the touch input.

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8. (Previously Presented) The touch interface of claim 4 wherein the characteristic includes the location of the touch input.

9. (Previously Presented) The touch interface of claim 4 wherein the characteristic includes at least a component of the force vector of the touch input.

10. (Previously Presented) The touch interface of claim 4 wherein the touch input includes one of a finger and a thumb in contact with the display screen.

11. (Previously Presented) The touch interface of claim 4 wherein the force feedback signal is directed to a portion of the display screen underlying the touch input.

12. (Previously Presented) The touch interface of claim 4 wherein the force element includes a piezoelectric crystal.

13. (Previously Presented) The touch interface of claim 4 wherein the force element includes an air blast generator.

14. (Previously Presented) The touch interface of claim 4 wherein the force feedback signal is an acoustic wave signal.

15. through 24. (Canceled)

25. (Currently Amended) ~~The~~ A computer implemented method according to claim 16 for providing tactile feedback in response to input received from a user, the method comprising:

providing a touch screen including a front surface, the touch screen adapted to display visually observable data;

providing a force element to actuate the touch screen;

detecting a first touch input on the touch screen front surface;
determining a characteristic of the first touch input; and
actuating the touch screen perpendicular to the touch screen front surface with the force element to provide a first force feedback signal in response to said detecting step, wherein[[:] the first force feedback signal includes a frequency; and the frequency is selected as a function of the characteristic of the first touch input.

26. (Currently Amended) ~~The~~ A computer implemented method ~~according to claim 16~~ for providing tactile feedback in response to input received from a user, the method comprising:

providing a touch screen including a front surface, the touch screen adapted to display visually observable data;

providing a force element to actuate the touch screen;
detecting a first touch input on the touch screen front surface;
determining a characteristic of the first touch input; and
actuating the touch screen perpendicular to the touch screen front surface with the force element to provide a first force feedback signal in response to said detecting step, wherein[[:] the first force feedback signal includes a pulse sequence; and the pulse sequence is selected as a function of the characteristic of the first touch input.

27. (Currently Amended) ~~The~~ A computer implemented method ~~according to claim 16~~ for providing tactile feedback in response to input received from a user, the method comprising:

providing a touch screen including a front surface, the touch screen adapted to display visually observable data;

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providing a force element to actuate the touch screen;
detecting a first touch input on the touch screen front surface;
determining a characteristic of the first touch input; and
actuating the touch screen perpendicular to the touch screen front surface with the force element to provide a first force feedback signal in response to said detecting step, wherein
the first force feedback signal includes an intensity; ~~and the intensity is selected as a function of~~
the characteristic of the first touch input.

28. (Currently Amended) ~~The~~ A computer implemented method according to claim 16
for providing tactile feedback in response to input received from a user, the method comprising:

providing a touch screen including a front surface, the touch screen adapted to display
visually observable data;

providing a force element to actuate the touch screen;
detecting a first touch input on the touch screen front surface;
determining a characteristic of the first touch input;
actuating the touch screen perpendicular to the touch screen front surface with the force element to provide a first force feedback signal in response to said detecting step; further
~~including~~

detecting a second touch input;
determining a characteristic of the second touch input different from the characteristic of
the first touch input; and

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