

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Timothy R. Pryor
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For : MULTIPOINT, VIRTUAL CONTROL AND FORCE BASED
TOUCH SCREEN APPLICATIONS
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Commissioner for Patents
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PRELIMINARY AMENDMENT

Before examination, please amend the above identified patent application as set forth on the following pages:

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CLAIMS

1. through 3. (Canceled)
4. (New) A touch interface comprising:

a display screen including a front 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 transducer responsive to the sensor circuit and adapted to excite the display screen by generating a force feedback signal in response to the characteristic of the touch input.
5. (New) 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. (New) 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. (New) 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.
8. (New) The touch interface of claim 4 wherein the characteristic includes the location of the touch input.

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

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

11. (New) 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. (New) The touch interface of claim 4 wherein the transducer includes a piezoelectric crystal.

13. (New) The touch interface of claim 4 wherein the transducer includes an air blast generator.

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

15. (New) A computer implemented method 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;

detecting a first touch input on the touch screen front surface; and

actuating the touch screen front surface with a first force feedback signal in response to said detecting step.

16. (New) The method according to claim 15 further including determining a characteristic of the first touch input.

17. (New) The method according to claim 16 wherein the characteristic of the first touch input includes the location of the first touch input on the touch screen front surface.

18. (New) The method according to claim 16 wherein the characteristic of the first touch input includes the force of the first touch input.

19. (New) The method according to claim 16 wherein the force feedback signal indicates a function selected by the user.

20. (New) The method according to claim 15 wherein the force feedback signal indicates the first touch input has registered.

21. (New) The method according claim 16 wherein:

the detecting step includes the first touch input generating a local surface distortion; and
the characteristic of the first touch input is based on the local surface distortion.

22. (New) The method according to claim 15 wherein the first touch input includes one of a finger and a thumb in contact with the touch screen front surface.

23. (New) The method according to claim 15 wherein said actuating step includes vibrating the touch screen front surface.

24. (New) The method according to claim 15 wherein the first force feedback signal is directed to a portion of the touch screen underlying the first touch input.

25. (New) The method according to claim 16 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. (New) The method according to claim 16 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. (New) The method according to claim 16 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. (New) The method according to claim 16 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

actuating the touch screen front surface with a second force feedback signal different from the first force feedback signal.

29. (New) The method according to claim 28 wherein:

the first force feedback signal includes a first pulse sequence; and

the second force feedback signal includes a second pulse sequence different from the first pulse sequence.

30. (New) The method according to claim 28 wherein the second touch input includes one of a finger and a thumb in contact with the touch screen.

31. (New) The method according to claim 28 wherein the second force feedback signal is directed to a portion of the touch screen underlying the second touch input.

32. (New) The method according to claim 28 wherein:

the first force feedback signal indicates a first function selected by the user; and

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