

16. The haptic feedback touch control of claim 12, wherein the first biasing element comprises an elastomeric element.

17. The haptic feedback touch control of claim 12, wherein the first biasing element comprises a foam material.

18. The haptic feedback touch control of claim 12, wherein the first and second structural element and the first biasing element are all formed from the same material and the first biasing element is formed thinner than the first and second structural elements so that it is free to flex when perturbed.

19. A haptic feedback touch control for inputting signals to a computer and for outputting forces to a user of the touch control, the touch control comprising:

a touch input device including a touch surface operative to input a position signal to a processor of said computer based on a location on said touch surface which said user contacts, said location being associated with a location of a cursor displayed on a display screen upon which a graphical object is also displayed; and

at least one actuator coupled to said touch input device, said actuator outputting a force on said touch input device to provide a haptic sensation to said user contacting said touch surface, wherein said actuator outputs said force as long as the location of the cursor on the display screen assumes a predetermined relationship with the location of the graphical object on the touch screen.

20. The haptic feedback touch control of claim 19, wherein the predetermined relationship is coincidence of location.

21. The haptic feedback touch control of claim 19, wherein the actuator comprises:

a first structural element having mounting structure mountable to a first component;

a second structural element having mounting structure mountable to a second component;

a first biasing element coupling the first structural element to the second structural element;

a first magnetic device carried by the first structural element, the first magnetic device including a first pole piece; and

a second magnetic device carried by the second structural element, the second magnetic device including a second pole piece;

a first coil disposed about at least one of said first pole piece and said second pole piece;

wherein the first biasing element is arranged to provide a biasing force opposing an attractive magnetic force urging the first and second pole pieces together when current is applied to the first coil and electric current applied to the first coil causes a haptic effect to be generated between the first component on the second component.

22. The haptic feedback touch control of claim 21, wherein the second magnetic device includes a second coil disposed about at least one of said first pole piece and said second pole piece.

23. The haptic feedback touch control of claim 21, further comprising a second biasing element, wherein the second

biasing element is arranged to provide a biasing force opposing an attractive magnetic force urging the first and second pole pieces together when current is applied to the first coil.

24. The haptic feedback touch control of claim 21, wherein the first biasing element comprises a spring.

25. The haptic feedback touch control of claim 21, wherein the first biasing element comprises an elastomeric element.

26. The haptic feedback touch control of claim 21, wherein the first biasing element comprises a foam material.

27. The haptic feedback touch control of claim 21, wherein the first and second structural element and the first biasing element are all formed from the same material and the first biasing element is formed thinner than the first and second structural elements so that it is free to flex when perturbed.

28. A haptic feedback touch control for inputting signals to a computer and for outputting forces to a user of the touch control, the touch control comprising:

a touch input device including a touch surface operative to input a position signal to a processor of said computer based on a location on said touch surface which said user contacts, said location being associated with a location of a cursor displayed on a display screen upon which a graphical object is also displayed; and

at least one actuator coupled to said touch input device, said actuator outputting a force on said touch input device to provide a haptic sensation to said user contacting said touch surface, wherein said actuator outputs said force based on an extent to which an action is triggered by a relative location of the cursor and the graphical object.

29. The haptic feedback touch control of claim 28, wherein the action is scrolling.

30. The haptic feedback touch control of claim 28, wherein the haptic feedback is based on a repetitive waveform whose frequency increases corresponding to the extent of the action.

31. A device for simulating a button press using haptic feedback imparted through a touch surface, comprising:

means for sensing a contact with said touch surface; and

means for moving the touch screen responsive to said contact in accordance with a first single-discontinuity waveform.

32. A device for providing haptic feedback representative of the relative location of a cursor and a graphical object displayed on a display screen, comprising:

means for associating the location of the cursor in the display screen with a contact location on a touch screen; and

means for providing haptic feedback by way of the touch screen as long as the location of the cursor on the display screen assumes a predetermined relationship with the location of the graphical object on the touch screen.

33. A device for providing haptic feedback representative of the extent to which an action triggered by manipulation of a cursor relative to a graphical object displayed on a display screen is occurring comprising: