

with the motion of the fingers. For instance, as the fingers rotate, the scroll wheel rotates with the fingers at the same time.

**[0085]** The various aspects, embodiments, implementations or features of the invention can be used separately or in any combination. The invention is preferably implemented by hardware, software or a combination of hardware and software. The software can also be embodied as computer readable code on a computer readable medium. The computer readable medium is any data storage device that can store data which can thereafter be read by a computer system. Examples of the computer readable medium include read-only memory, random-access memory, CD-ROMs, DVDs, magnetic tape, optical data storage devices, and carrier waves. The computer readable medium can also be distributed over network-coupled computer systems so that the computer readable code is stored and executed in a distributed fashion.

**[0086]** While this invention has been described in terms of several preferred embodiments, there are alterations, permutations, and equivalents, which fall within the scope of this invention. For example, although the invention has been primarily directed at touchscreens, it should be noted that in some cases touch pads can also be used in place of touchscreens. Other types of touch sensing devices can also be utilized. It should also be noted that there are many alternative ways of implementing the methods and apparatuses of the present invention. It is therefore intended that the following appended claims be interpreted as including all such alterations, permutations, and equivalents as fall within the true spirit and scope of the present invention.

What is claimed is:

1. An apparatus providing multi-touch haptic feedback, comprising
  - a touch pad having a touch sensitive surface arranged to receive a user provided multi-touch event associated with at least two different locations on the touch sensitive surface;
  - a multi-touch detection mechanism operatively coupled to the touch sensitive surface that detects the multi-touch event and generates a corresponding a multi-touch signal; and
  - a plurality of haptic feedback devices operatively coupled to the multi-touch detection mechanism and the touch sensitive surface cooperatively arranged to concurrently provide tactile feedback at each of the at least two different locations on the touch sensitive surface in response to the multi-touch signal.
2. The apparatus as recited in claim 1, wherein the tactile feedback at each of the at least two different locations are discreet from one another.
3. The apparatus as recited in claim 2, wherein when the multi-touch signal indicates that the multi-touch event is a dynamic multi-touch event indicating a change in the multi-touch event, then the tactile feedback at each of the at least two different locations is updated to reflect the change in the multi-touch event.
4. The apparatus as recited in claim 1, wherein the tactile feedback event is different for each of the at least two different locations.
5. A method for processing a touch event at a touch sensitive surface, comprising:
  - receiving a user provided multi-touch event associated with at least two different locations on the touch sensitive surface;

- detecting the multi-touch event;
  - generating a multi-touch signal corresponding to the multi-touch event; and
  - concurrently providing tactile feedback at each of the at least two different locations on the touch sensitive surface in response to the multi-touch signal wherein the tactile feedback at each of the at least two different locations are discreet from one another.
6. The method as recited in claim 5, wherein when the multi-touch signal indicates that the multi-touch event is a dynamic multi-touch event corresponding to a change in the multi-touch event over a period of time, then the tactile feedback at each of the at least two different locations is updated in real time to reflect the change in the multi-touch event.
  7. A multi-touch haptic mechanism, comprising:
    - a touch pad having a touch sensitive surface arranged to detect a user touch event at substantially any location on the touch sensitive surface; and
    - a plurality of independent haptic devices operatively coupled to the touch sensitive surface each providing a corresponding type of tactile feedback in response to a nearby user touch event thereby providing a tactile feedback at substantially any location on the touch sensitive surface at which the user touch event has occurred.
  8. The multi-touch haptic mechanism as recited in claim 7, wherein each of the nearby haptic device only responds to the user touch event in one or more associated regions of the touch sensitive surface.
  9. The multi-touch haptic mechanism as recited in claim 8, wherein at least two nearby haptic devices concurrently respond to the user touch event by providing a compound haptic response.
  10. The multi-touch haptic mechanism as recited in claim 9 wherein the compound haptic response is different than the haptic response type provided by either of the at least two independent haptic devices separately.
  11. A method for processing a user touch event at a touch sensitive surface having a plurality of independent haptic devices coupled thereto, wherein each of the haptic devices provides a corresponding type of tactile feedback, comprising:
    - detecting the user touch event on the touch sensitive surface; and
    - providing a particular tactile feedback in response to the user touch event by the haptic device associated with the location of the user touch event, wherein the particular tactile feedback is different for each location on the touch sensitive surface.
  12. The method as recited in claim 11, wherein each of the plurality of independent haptic devices only responds to the user touch event in one or more associated regions of the touch sensitive surface.
  13. An integrated device arranged to act as both a force sensing device and a haptic feedback device, comprising:
    - a touch sensitive surface;
    - a controller unit; and
    - a mechanical actuator coupled with the controller unit and the touch sensitive surface, wherein the integrated device acts as the force sensing device by,
      - generating an output voltage in direct proportion to a force applied to the mechanical actuator by a user touching the touch sensitive surface,
      - sensing the output voltage by the controller unit, and