

utilizing the third input's distance from the virtual axis, the magnitude of tilt rotation is a function of the force of the third input.

**[0072]** Various embodiments for interfacing with multi-point input devices have been described. The present invention also encompasses a system capable of carrying out the various interfacing techniques and processes described herein. For example, FIG. 7 is a block diagram of a multi-point input system **20** that includes a display device **30** coupled to a controller **40**. Display device **30** includes a display surface (also called contact surface) and may be any suitable type of multi-point input display device capable of detecting multiple inputs simultaneously. Various suitable multi-point input display devices that may be employed include those described in U.S. patent application Ser. No. 11/833,908, which is incorporated herein by reference. Controller **40** operates to carry out the various processing functions described herein, and may be a pre-programmed general purpose computer or other known system or device that carries out the novel functions/steps as previously described. Controllers suitable for use within the present invention are well known, and it is within the abilities of one of ordinary skill in the art to design and/or program a controller to implement the processes, techniques and features of the present invention, given the description provided herein. Accordingly, the present invention encompasses a system that includes a display device and a controller capable of implementing the above-described techniques and processes. Consistent with other variations described herein, display device **30** may include a multi-point input device and, as a separate element, a display device.

**[0073]** The present invention has been described in the context of a number of embodiments, and for various ones of those embodiments, a number of variations and examples thereof. It is to be understood, however, that other expedients known to those skilled in the art or disclosed herein may be employed without departing from the spirit of the invention.

**[0074]** Therefore, it is intended that the appended claims be interpreted as including the embodiments described herein, the alternatives mentioned above, and all equivalents thereto.

What is claimed is:

**1.** A method of interfacing with a multi-point input device, comprising the steps of:

displaying an image on a display device;  
 detecting positions of a plurality of elements simultaneously contacting the display device;  
 ascertaining amounts of pressure exerted by the elements on the display device; and

controlling a change in the image displayed on the display device in accordance with the ascertained amounts of pressure exerted by the elements on the display device.

**2.** The method of claim **1**, wherein displaying an image on a display device comprises displaying an image corresponding to a three-dimensional graphical representation of an object.

**3.** The method of claim **2**, wherein controlling a change in the image displayed on the display device comprises effecting a rotation of the image about an axis parallel to a display plane substantially corresponding to a surface of the display device on which the image is displayed.

**4.** The method of claim **1**, wherein controlling a change in the image displayed on the display device comprises effecting a rotation of the image about an axis parallel to a display

plane, the rotation being in a direction corresponding to the ascertained amounts of pressure exerted by the elements on the display device.

**5.** The method of claim **1**, wherein controlling a change in the image displayed on the display device comprises effecting a rotation of the image about a rotation axis that is perpendicular to an axis extending through positions of first and second elements simultaneously contacting the display device.

**6.** The method of claim **5**, wherein the rotation axis is disposed substantially within a display plane substantially corresponding to a surface of the display device on which the image is displayed.

**7.** The method of claim **1**, further comprising identifying a circle in which positions of all of the elements simultaneously contacting the display device are disposed; and wherein controlling a change in the image displayed on the display device comprises effecting a rotation of the image about a rotation axis that extends through a centerpoint of the circle, the rotation axis being parallel to an axis extending through positions of at least two of the elements and the rotation axis being disposed substantially within a display plane substantially corresponding to a surface of the display device on which the image is displayed.

**8.** The method of claim **1**, wherein displaying an image on a display device comprises displaying an image on a pressure-sensitive display device adapted to ascertain amounts of pressure exerted by elements contacting the display device.

**9.** The method of claim **1**, wherein ascertaining amounts of pressure exerted by the elements on the display device comprises ascertaining pressure as a function of an area of contact by a respective one of the elements contacting the display device.

**10.** The method of claim **1**, wherein controlling a change in the image displayed on the display device comprises ascertaining a virtual depth below a contact surface of the display device of each of the elements contacting the contact surface as a function of the amount of pressure exerted by the respective element on the contact surface, and effecting a rotation of the image in accordance with the identified virtual depths of the elements contacting the contact surface.

**11.** The method of claim **1**, wherein the image is divided into first and second halves; and controlling a change in the image displayed on the display device comprises comparing the amounts of pressure exerted by the elements disposed on the first half of the image with the amounts of pressure exerted by the elements disposed on the second half of the image, and effecting a rotation of the image as a function of the comparison.

**12.** The method of claim **1**, wherein controlling a change in the image displayed on the display device comprises effecting, when the pressure exerted by the elements on the display device exceed a predetermined minimum threshold, a rotation of the image about an axis in accordance with the ascertained amounts of pressure exerted by the elements on the display device.

**13.** The method of claim **1**, wherein detecting positions of a plurality of elements simultaneously contacting the display device comprises detecting positions of at least three elements simultaneously contacting the display device; the method further comprising the step of identifying a change in an attribute of any of the elements; and wherein controlling a change in the image displayed on the display device comprises controlling a change in the image both in accordance