In FIG. **8**, the bottom left hand corner is set as the origin of the coordinate axes. In FIG. **9**, the center of the left side is set as the origin of the coordinate axes.

According to Newton's laws of force, the sum of vectors of all forces applied to a rigid body and the sum of vectors of moments M applied thereto are zero. Hence, when a force F is applied to the touch screen **1**, because the touch screen does not substantially move or rotate, ΣF and ΣM are zero.

In the case of the coordinate axes shown in FIG. **8**, the sum of all forces F is zero, and because there is no force with respect to the direction of the X-axis or Y-axis, the equations ΣFx=0 and ΣFy=0 are satisfied. Because the magnitude of a force F applied in the direction of the Z-axis is equal to the sum of the intensities of the opposing forces f**1**, f**2**, f**3** and f**4** measured at the sensing points S, F=f**1**+f**2**+f**3**+f**4** (equation 1) is obtained from the equation ΣFz=0.

Furthermore, based on the fact that the sum of all moments is zero, there is no moment with respect to the Z-axis, so that ΣMz=0 is satisfied.

With regard to moments relative to the X-axis, because forces f**2** and f**3** are applied in counterclockwise directions at positions spaced apart from the X-axis by the distance N, moments having magnitude of N·f**2** and N·f**3** are applied to the X-axis in counterclockwise directions. In addition, because a force F is applied in a clockwise direction at a position spaced apart from the X-axis by the distance y, a moment having magnitude of y·F is applied to the X-axis in a clockwise direction.

Hence, from ΣMx=0, −y·F+N·f**2**+N·f**3**=0 is satisfied.

As a result, y=N(f**2**+f**3**)/F (equation 2) is obtained.

With regard to moments relative to the Y-axis, because forces f**3** and f**4** are applied in counterclockwise directions at positions spaced apart from the Y-axis by the distance L, moments having magnitude of L·f**3** and L·f**4** are applied to the Y-axis in counterclockwise directions. In addition, because the force F is applied in a clockwise direction at a position spaced apart from the X-axis by the distance y, a moment having magnitude of x·F is applied to the Y-axis in a clockwise direction.

Hence, from ΣMy=0, x·F−L·f**3**−L·f**4**=0 is satisfied.

As a result, x=L(f**3**+f**4**)/F (equation 3) is obtained.

Therefore, if forces f**1**, f**2**, f**3** and f**4** measured at the sensing points S are determined, magnitude of a touch pressure can be obtained from the equation 1 and coordinates thereof can be obtained from the equations 2 and 3.

In the case where the coordinate axes are set as shown in FIG. **9**, if the same conditions as that of FIG. **8** are given, there is no force with respect to the direction of the X-axis or Y-axis, and F=f**1**+f**2**+f**3**+f**4** (equation 4) is obtained from ΣFz=0.

Furthermore, from the fact that the sum of all moments is zero, there is no moment with respect to the Z-axis, so that ΣMz=0 is satisfied.

With regard to moments relative to the X-axis, because a force f**2** is applied in a counterclockwise direction at a position spaced apart from the X-axis by the distance N/2, a moment having magnitude of N·f**2**/2 is applied to the X-axis in a counterclockwise direction. In addition, because a force f**4** is applied in a clockwise direction at a position spaced apart from the X axis by the distance N/2, a moment having magnitude of N·f**4**/2 is applied to the X-axis in a clockwise direction. Furthermore, a force F is applied downwards at a position spaced apart from the X-axis by the distance y, so that a moment having magnitude of y·F is applied to the X-axis in a clockwise direction. Because f**1** and f**3** are present on the X-axis, f**1** or f**3** does not generate a moment relative to the X-axis.

Therefore, from ΣMx=0, −y·F+N·f**2**/2−N·f**4**/2=0 is satisfied.

Ultimately, y=N·(f**2**−f**4**)/2F (equation 5) is obtained.

In the same manner, with regard to moments relative to the Y-axis, because the forces f**2** and f**4** are applied in counterclockwise directions at positions spaced apart from the Y-axis by the distance L/2, moments having magnitude of L·f**2**/2 and L·f**4**/2 are applied to the Y-axis in counterclockwise directions.

Furthermore, because the force f**3** is applied in a counterclockwise direction at a position spaced apart from the Y-axis by the distance L, a moment having magnitude of L·f**3** is applied to the Y-axis in a counterclockwise direction. In addition, the force F is applied downwards at a position spaced apart from the Y-axis by the distance x, so that a moment having the magnitude of x·F is applied to the Y-axis in a clockwise direction.

Therefore, from ΣMy=0, x·F−L·f**2**/2−L·f**4**/2−L·f**3**=0 is satisfied.

Ultimately, x=L(f**2**+2f**3**+f**4**)/2F (equation 6) is obtained.

Therefore, in the same manner as the case of FIG. **8**, if forces f**1**, f**2**, f**3** and f**4** measured at the sensing points S are determined, a magnitude of a touch pressure can be obtained from the equation 4 and coordinates thereof can be obtained from the equations 5 and 6.

In the example of FIG. **8** or **9**, although the origin of the coordinate axes is set at any location, the above-mentioned calculation principle can be used. The result obtained from the coordinate axes set by the above method can be applied through coordinate transformation to other coordinate axes selected by the user.

Furthermore, although FIGS. **8** and **9** illustrate the case having four sensing points, in even the case where the number of sensing points is greater than four, a touch location and the magnitude of touch pressure can be calculated by the same principle.

As described above, when a force F having a predetermined magnitude is applied to a touch point P, variation rates in capacitances at the sensing points S are measured. The variation rates in capacitances vary depending on a touch location and the magnitude of touch pressure. From the relationship equations with respect to the variation rates of the capacitances, the touch location and the magnitude of touch pressure, the coordinates of the touch location and the magnitude of touch pressure can be obtained.

Data about a touch location and the magnitude of touch pressure, obtained by the touch screen **1** of the present invention, can be effectively used as input signals of various devices. Particularly, unlike the conventional capacitive touch screen which cannot determine the magnitude of touch pressure, if the touch screen **1** of the present invention is connected to software which requires the determination of the magnitude of touch pressure, various input signals which could not be implemented in the conventional touch screen can be created.

As one example of the application of the touch screen of the present invention, in the conventional technique, to conduct acceleration of a scrolling function of an MP3 player to select a program, an input signal of an acceleration key must be generated in such a way as to measure the time for which a scroll bar is continuously pushed. However, in the present invention which can measure the intensity of touch pressure, an input signal of an acceleration key can be generated depending on the intensity of pressure pushing against the touch screen.

As another example in which the touch screen of the present invention is applied to various kinds of game pro-