any modifier symbols being held down by the opposite hand. Step **812** records the time the key symbol is sent for future reference by decision diamond **808**. Processing then returns to step **770** to await the next proximity image scan.

[**0293**] Until the finger lifts off or another taps asynchronously, processing will pass through decision diamond **798** to check whether the key symbol should be sent again. Step **806** computes the symbol repeat interval dynamically to be inversely proportional to finger proximity. Thus the key will repeat faster as the finger is pressed on the surface harder or a larger part of the fingertip touches the surface. This also reduces the chance that the user will cause more repeats than intended since as finger proximity begins to drop during liftoff the repeat interval becomes much longer. Decision diamond **808** checks whether the dynamic repeat interval since the last typematic symbol send has elapsed, and if necessary sends the symbol again in **810** and updates the typematic send time stamp **812**.

[**0294**] It is desirable to let the users rest the other fingers back onto the surface after typematic has initiated **804** and while typematic continues, but the user must do so without tapping. Decision diamond **805** causes typematic to be canceled and the typematic element deleted **778** if the user asynchronously taps another finger on the surface as if trying to hit another key. If this does not occur, decision diamond **182** will eventually cause deletion of the typematic element when its finger lifts off.

[**0295**] The typing recognition process described above thus allows the multi-touch surface to ergonomically emulate both the typing and hand resting capabilities of a standard mechanical keyboard. Crisp taps or impulsive presses on the surface generate key symbols as soon as the finger is released or decision diamond **792** verifies the impulse has peaked, ensuring prompt feedback to the user. Fingers intended to rest on the surface generate no keys as long as they are members of a synchronized finger press or release subset or are placed on the surface gently and remain there along with other fingers for a second or two. Once resting, fingers can be lifted and tapped or impulsively pressed on the surface to generate key symbols without having to lift other resting fingers. Typematic is initiated ether by impulsively pressing and maintaining distinguishable force on a key, or by holding a finger on a key while other fingers on the hand are lifted. Glancing motions of single fingers as they tap key regions are easily tolerated since most cursor manipulation must be initiated by synchronized slides of two or more fingers.

[**0296**] Other embodiments of the invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.

What is claimed is:

1. A method of processing input from a touch-sensitive surface, the method comprising:

receiving at least one proximity image representing a scan of a plurality of electrodes of the touch-sensitive surface;

segmenting each proximity image into one or more pixel groups that indicate significant proximity, each pixel group representing proximity of a distinguishable hand part or other touch object on or near the touch-sensitive surface; and

fitting an ellipse to at least one of the pixel groups.

2. The method of claim 1 further comprising transmitting one or more ellipse parameters as a control signal to an electronic or electromechanical device.

3. The method of claim 2 wherein the one or more ellipse parameters is selected from the group consisting of position, shape, size, orientation, eccentricity, major radius, minor radius, and any combination thereof.

4. The method of claim 3 wherein the one or more ellipse parameters are used to distinguish a pixel group associated with a fingertip from a pixel group associated with a thumb.

5. The method of claim 1 wherein fitting an ellipse to a group of pixels comprises computing one or more eigenvalues and one or more eigenvectors of a covariance matrix associated with the pixel group.

6. The method of claim 1 further comprising:

tracking a path of at least one of the one or more pixel groups through a time-sequenced series of proximity images;

fitting an ellipse to the at least one of the one or more pixel groups in each of the time-sequenced series of proximity images; and

tracking a change in one or more ellipse parameters through the time-sequenced series of proximity images.

7. The method of claim 6 further comprising transmitting the change in the one or more ellipse parameters as a control signal to an electronic or electromechanical device.

8. The method of claim 7 wherein the change in the one or more ellipse parameters is selected from the group consisting of position, shape, size, orientation, eccentricity, major radius, minor radius, and any combination thereof.

9. The method of claim 6 wherein fitting an ellipse to the one pixel group comprises computing one or more eigenvalues and one or more eigenvectors of a covariance matrix associated with the pixel group.

10. A touch-sensing device comprising:

a substrate;

a plurality of touch-sensing electrodes arranged on the substrate;

electronic scanning hardware adapted to read the plurality of touch-sensing electrodes;

a calibration module operatively coupled to the electronic scanning hardware and adapted to construct a proximity image having a plurality of pixels corresponding to the touch-sensing electrodes; and

a contact tracking and identification module adapted to:

segment the proximity image into one or more pixel groups, each pixel group representing proximity of a distinguishable hand part or other touch object on or near the touch-sensitive surface; and

fit an ellipse to at least one of the one or more pixel groups.

11. The touch-sensing device of claim 10 further comprising a host communication interface adapted to transmit one or more ellipse parameters as a control signal to an electronic or electromechanical device.