

initialization, step **810** sends out the key symbol for the first time to the host interface communication queue, along with 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.

[**0294**] 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**.

[**0295**] 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.

[**0296**] 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 either 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.

[**0297**] 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 contact evaluation system comprising:

a. a contact identification unit that examines contacts with respect to sensor surface and produces first indications regarding the nature and position of sensed contacts;

b. a contact synchronization unit that receives and evaluates the first indications to determine if two or more contacts are activated substantially simultaneously and produces second indications identifying qualifying contacts;

c. a motion extraction unit that receives and evaluates the first indications produces third indications regarding motion of sensed contacts over time; and

d. an event generator that receives and evaluates second indications and third indications, and produces an event signal based thereon.

2. The system of claim 1 wherein the contacts comprise identifiable portions of a human hand.

3. The system of claim 1 wherein the contacts comprise a plurality of fingers and a portion of a hand other than a finger.

4. The system of claim 1 wherein contacts activated substantially simultaneously are either a plurality of fingers initiating contact with the sensor surface or a plurality of fingers terminating contact with the sensor surface.

5. The system of claim 1 wherein contacts comprise fingers that are within sensing range of the sensor surface but not physically touching the sensor surface.

6. The system of claim 1 wherein the event signal indicates a chord.

7. A method comprising the steps of:

e. examining contacts with respect to sensor surface and producing first indications regarding the nature and position of sensed contacts;

f. evaluating the first indications to determine if two or more contacts are activated substantially simultaneously and producing second indications qualifying contacts;

g. evaluating the first indications and producing third indications regarding motion of sensed contacts over time; and

h. evaluating second indications and third indications and producing an event signal based thereon.

8. The method of claim 7 wherein the contacts comprise identifiable portions of a human hand.

9. The method of claim 7 wherein the contacts comprise a plurality of fingers and a portion of a hand other than a finger.

10. The method of claim 7 wherein contacts activated substantially simultaneously are either a plurality of fingers initiating contact with the sensor surface or a plurality of fingers terminating contact with the sensor surface.

11. The method of claim 7 wherein contacts comprise fingers that are within sensing range of the sensor surface but not physically touching the sensor surface.

12. The method of claim 7 wherein the event signal indicates a chord.

13. A method comprising the steps of:

i. examining a human hand with respect to sensor surface and periodically producing first indications regarding the nature and position of sensed contacts, the contacts including identified hand parts;

j. evaluating the first indications to determine if two or more hand parts activate the sensor surface substan-