-continued

```
1,3,5,7};
previous_A_electrode_sensor[NUM_SENSORS] = {6,0,1,2,3,4,5,
6,1,3,5};
// Group B electrode and sensor mappings
Sensor_to_B_type_electrode[NUM_SENSORS] = {15,8,17,
10,19,12,21,14,16,18,20};
next_B_electrode_sensor[NUM_SENSORS] = {8,8,9,9,10,10,0,0,2,
4,6};
previous_A_electrode_sensor[NUM_SENSORS] = {7,7,8,8,9,9,10,
10,0,2,4};
// Electrode to sensor mapping
Electrode_to_Sensor[NUM_ELECTRODES] = {
        0, // 0
        1, // 1
        2, // 2
        3, // 3
        4, // 4
        5, // 5
        6, // 6
        7, // 7
        1, // 8
        8, // 9
        3, // 10
        9, // 11
        5, // 12
        10, // 13
        7, // 14
        0, // 15
        8, // 16
        2, // 17
        9, // 18
        4, // 19
        10, // 20
        6 // 21
    };
    // This code finds the sensor that has the strongest signal
    void findMaxSensor(void) {
        unsigned char maxval, i;
        max_sensor = 0;
        maxval = 0;
        for (i = 0; i < NUM_SENSORS; i++) {
            if (SensorData[e] > maxval) {
                maxval = SensorData[i];
                max_sensor = i;
            }
        }
    }
    // This code finds the electrode that has the strongest
    signal
    // It starts by examining the electrodes adjacent to those electrodes
    // that belong to the maximum sensor. The electrode being touched is
    // identified by comparing the signal strength of the two electrodes on
    // either side of the electrodes belonging to the maximum sensor. The
    // group with the largest signal is the one under the touching finger.
    void findMaxElectrode(void) {
        int Asum, Bsum;
        Asum = SensorData[next_A_electrode_sensor[max_
        sensor]] +
                SensorData[previous_A_electrode_sensor[max_
                sensor]];
        Bsum = SensorData[next_A_electrode_sensor[max_sensor]] +
                SensorData[previous_B_electrode_sensor[max_
                sensor]];
        if (Asum > Bsum) {
            maxelectrode = Sensor_to_A_type_electrode
            [max_sensor];
        } else {
            maxelectrode = Sensor_to_B_type_electrode
            [max_sensor];
        }
    }
    // This code computes the centroid corresponding to the touching
    // finger using the location decoded using the algorithm of the
    invention.
    #define CENTMULTIPLIER 8
    void computeCentroid(void) {
```

-continued

```
        int pos_sum, electrode;
        char offset;
        int sval;
        pos_sum = 0;
        total_signal = 0;
        //sum from maxelectrode in positive direction for two electrodes
        for (offset = 1; offset < 3; offset++) {
            electrode = maxelectrode + offset;
        if (electrode >= NUM_ELECTRODES) {
            electrode -= NUM_ELECTRODES;
        }
        sval = SensorData[Electrode_to_Sensor[electrode]];
        total_signal += sval;
        pos_sum += CENTMULTIPLIER*sval*offset;
    }
        //sum from maxelectrode in negative direction for two electrodes
        for (offset = 1; offset <3; offset++) {
        electrode = maxelectrode - offset;
        if (electrode < 0) {
            electrode += NUM_ELECTRODES;
        }
        sval = SensorData[Electrode_to_Sensor[electrode]];
        total_signal += sval;
        pos_sum -= CENTMULTIPLIER*sval*offset;
    }
    total_signal += SensorData[maxe];
    sval = pos_sum/total_signal;
    sval += CENTMULTIPLIER*maxelectrode; //absolute offset
    by maxelectrode
    if(sval < 0) {
        Centroid = 176 + sval;
    }
    else {
        Centroid = sval;
    }
}
```

[0026] While the invention has been disclosed with respect to a limited number of embodiments, numerous modifications and variations will be appreciated by those skilled in the art. It is intended that all such variations and modifications fall with in the scope of the following claims.

What is claimed is:

1. A touch sensitive device comprising:

a plurality of touch sensitive electrodes; and

a number of sense circuits, wherein the number of sense circuits is less than the number of touch sensitive electrodes such that at least one sense circuit is shared between more than one of the touch sensitive electrodes;

wherein each of the touch sensitive electrodes that share a sense circuit are spatially separated from each other by a dispersal distance and wherein each touch sensitive electrode is directly connected to a sense circuit.

2. The touch sensitive device of claim 1 wherein the dispersal distance is approximately one-third of a characteristic dimension of the touch sensitive device.

3. The touch sensitive device of claim 1 wherein each sense circuit is directly connected to two touch sensitive electrodes

4. The touch sensitive device of claim 1 wherein the plurality of touch sensitive electrodes are arranged in a circular array.

5. The touch sensitive device of claim 4 wherein the dispersal distance is approximately one-third the circumference of the circular array.