

buffer X1. In this circuit, the buffer is capacitively coupled to the sensor plate 801 (and into the detector generally) and thus makes no attempt to follow any DC or low frequency excursion of the buffer. This makes the circuit intrinsically immune to noise away from the operating frequency.

[0216] The main differences between these techniques and the prior art are:

[0217] Detecting and responding to touch using signal processing means so arranged as to differentiate between an unwanted signal and a touch caused by a user with output means so arranged as to give immediate video and/or audio tactile feedback. Said signal processing means comprising: a detector sensitive to changes in the capacitance of a sensor by detecting the current/voltage/phase change across an impedance connected to a varying signal, and the signal present on the sensor feed back through a finite frequency response buffer amplifier to one or more shield planes including the substrates of any chips within the sensing chain.

[0218] Signal processing means so arranged as to differentiate between a deliberate touch and noise or an unwanted touch by reference to many sensors.

[0219] Signal processing means so arranged as to differentiate between a deliberate touch and noise or an unwanted touch by reference to the capacitive analogue of the distance, speed and acceleration of the touching object.

[0220] Signal processing means so arranged as to immediately, within <50 mS, indicate to the user the detection of their touch via the flashing or turning on of a light or similar optical change through the touch detection sensor.

[0221] Artwork and detection means placed behind a window and so designed as to present the user with one or more touch zones which are operable through that window and upon touching cause a reaction.

[0222] One or more sensitive pads connected via shielding means to a control means which detects the touch of a human finger on the pad through that window and via the control means generates an electrical signal which can operate equipment.

[0223] Same where the pad is made from transparent material so that the artwork can be backlit through the pad or so that an image can be seen through the pad.

[0224] Same where the pad is made from a translucent and optionally coloured material that provides a degree of light diffusion such that the back light is evenly distributed across the artwork.

[0225] Same where the pad is made from a grid or mesh of conductive elements such that it is partially transparent/translucent.

[0226] Same where the controlling electronics is implemented by utilising a means of applying an oscillating signal of a particular frequency onto a plate via a high value resistor and monitoring the signal after the high value resistance with an amplifier and synchronous AM demodulator.

[0227] Same where the amplifier means provides a buffering signal which varies in synchronisation with the sensor signal and is applied to a number of guards.

[0228] Same where the guard element includes a multiplexing element.

[0229] Same where that multiplexing element is controlled by way of a level translator means such that the buffer is always operating within its design parameters.

[0230] Same where a plurality of multiplexers is connected in series such that each multiplexer is buffered.

[0231] A system so arranged that multiplexers are controlled through a serial interface such that an interposed serial to parallel decoder determines which multiplexer line is connected to the sensor input.

[0232] Same in which coaxial cable and coaxial connectors are used throughout to provide the shielded means of collecting signals from the sensors.

[0233] Same where a high value resistor is placed front the sensor to a low impedance point in the circuit so that static accumulating on a sensor can find a path to ground.

[0234] A means for detecting a touch on a surface connected to a means of generating vibration on said surface such that that vibration provides tactile and optionally audio feedback.

[0235] A plurality of capacitive proximity sensing elements connected to control means such that the position of a finger over a surface can be determined in 2 or more dimensions.

[0236] Same arranged as an X, Y grid such that the intermediate position of a finger between two or more elements can be determined in the X and Y dimensions.

[0237] Capacitive elements arranged as a "String on beads" such that each capacitive sensing element comprises a pad connected to the previous pad by way of a resistor.

[0238] A capacitive element where the capacitance and resistance are distributed rather than formed from lumped elements.

[0239] A system as claimed in claim 1 wherein a record is kept of the maximum sensed value of a press among the last n presses (the number n of presses being chosen for optional operating conditions, typically the last 128 presses) and this is used to alter dynamically the sensitivity to touch. Preferably, there is also a reset feature for this, so as to adapt the sensitivity to each operator, for example automatic, e.g. responsive an interval between presses longer than usual (or longer than a preset time), or a change in one or more characteristics of the press, e.g. absolute capacitance and/or geometrical area of effect of the press.