

[0074] Preferably, said testing comprises:

[0075] outputting a signal to each of a plurality of sensors on one axis of said grid,

[0076] detecting at each of a plurality of sensors on a second axis of said grid,

[0077] outputting a signal to each of said plurality of sensors on said second axis of said grid,

[0078] detecting at each of said plurality of sensors on said first axis of said grid,

[0079] from said detecting deducing sensors that are possible sources of ambiguity, and

[0080] conducting further outputting and detecting to resolve said ambiguity.

[0081] Preferably, said conducting further outputting comprises selecting one of said axes and outputting a signal to each of said possible sources of ambiguity thereon, and said detection comprises detecting at each of said possible sources on the other of said axes for each said outputting.

[0082] Preferably, said testing comprises an exhaustive test of each of said pressure points individually.

[0083] Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. The materials, methods, and examples provided herein are illustrative only and not intended to be limiting.

[0084] Implementation of the method and system of the present invention involves performing or completing selected tasks or steps manually, automatically, or a combination thereof. Moreover, according to actual instrumentation and equipment of preferred embodiments of the method and system of the present invention, whilst part of the invention requires hardware, certain selected steps may be implemented by hardware or by software on any operating system or any firmware or a combination thereof. For example, as hardware, selected steps of the invention may be implemented as a chip or a circuit. As software, selected steps of the invention could be implemented as a plurality of software instructions being executed by a computer using any suitable operating system. In any case, selected steps of the method and system of the invention could be described as being performed by a data processor, such as a computing platform for executing a plurality of instructions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0085] The invention is herein described, by way of example only, with reference to the accompanying drawings. With specific reference now to the drawings in detail, it is stressed that the particulars shown are by way of example and for purposes of illustrative discussion of the preferred embodiments of the present invention only, and are presented in the cause of providing what is believed to be the most useful and readily understood description of the principles and conceptual aspects of the invention. In this regard, no attempt is made to show structural details of the invention in more detail than is necessary for a fundamental understanding of the invention, the description taken with the drawings making apparent to those skilled in the art how the several forms of the invention may be embodied in practice.

[0086] In the drawings:

[0087] FIG. 1 is a simplified block diagram of a dual technology sensor according to a first preferred embodiment of the present invention;

[0088] FIG. 2 is a screen display showing a virtual keyboard;

[0089] FIG. 3 is a schematic diagram showing conductors laid out in a two-layer sensing arrangement according to a preferred embodiment of the present invention;

[0090] FIG. 4 is a simplified diagram showing an enlargement of one of the foils of the arrangement of FIG. 3;

[0091] FIG. 5 is a simplified vertical cross-sectional diagram showing two foils superimposed upon each one another and separated by spacers, in accordance with a preferred embodiment of the present invention;

[0092] FIG. 6 is a simplified diagram showing a view from above of a separation layer for placing between the foils;

[0093] FIG. 7 is a simplified block diagram of a preferred embodiment of the digital processing unit of FIG. 1;

[0094] FIG. 8 is a simplified schematic diagram showing apparatus for detecting a single touch;

[0095] FIG. 9 is a simplified flow chart showing a first preferred embodiment of a procedure for detecting simultaneous multiple touches on a sensor;

[0096] FIG. 10 is a simplified flow chart showing a second, more efficient, embodiment of a procedure for detecting simultaneous multiple touches on a sensor; and

[0097] FIG. 11 is a simplified flow chart showing a third, more accurate, embodiment of a procedure for detecting simultaneous multiple touches on a sensor.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0098] The present embodiments disclose a patterned transparent conductive foil system, able to detect the location and if relevant, identity, of physical objects, and further to enable finger inputs directly on the display. The primary use of the embodiments is to allow both stylus operation and the natural and intuitive finger operation of an "on-screen" or virtual keyboard. The embodiments are particularly useful for incorporation into mobile devices since they provide a single digitiser system. However they are useful as an intuitive and flexible data entry or user interaction system in any circumstances where users need to interact with a computer system.

[0099] The present embodiments also disclose a touch screen able to sense multiple simultaneous touches, and thus to support so-called chord key operations.

[0100] The embodiments may thus be used to support virtual keyboards in such a way as to overcome the disadvantages of the above-described prior art technologies. The embodiments combine electromagnetic and touch-sensitive technologies in a single transparent foil system. In addition, the preferred embodiments enable the detection of more than a single touch input at the same time, thereby enabling chord key operation.