layers. It is noted that the touch sensitive stripes are not necessarily wide. In another preferred embodiment they are the same width as the conductive lines. The spacing between the conductive stripes is preferably selected to be suitable for the resolution level to which it is necessary to detect fingers. The EM sensitive narrow lines detect electromagnetic emissions from the stylus and have a resolution level which depends on the level of signal processing. Preferably the resolution level is higher than that of the conductive stripes and is preferably selected for the requirements of the relevant applications. The higher resolution may be achieved by carrying out interpolations between the signals received at surrounding sensor lines.

[**0114**] Reference is now made to **FIG. 4**, which is a simplified diagram showing an enlargement of one of the foils of the arrangement of **FIG. 3**. The layer comprises parallel conductors in one of the orientations, that is to say vertical or horizontal, of the grid. Touch sensitive wide conductive stripes **50** and **52**, used for sensing touch pressure, are patterned between conductive lines **54**, **56** and **58** that are used as electromagnetic antennas. In this manner, conductive stripes are patterned in between pairs of conductive lines on each of two foils. The two foils are then superimposed to form a two dimensional grid comprising horizontal stripes located on one transparent foil, and vertical stripes located on the other transparent foil.

[**0115**] Reference is now made to **FIG. 5**, which is a simplified vertical cross-sectional diagram showing two foils superimposed upon one another and separated by spacers, in accordance with a preferred embodiment of the present invention.

[**0116**] Two foils, **60** and **62**, respectively contain horizontal sensor patterns and vertical sensor patterns. The foils are assembled one on top of the other, and are separated by a non-conductive separation layer **64**. Each foil has a conductive surface, **66** and **68** respectively. The foils are arranged so that the conductive side of each foil faces the other foil.

[**0117**] Reference is now made to **FIG. 6**, which is a simplified diagram showing a view from above of the separation layer **64**. The separation layer **64** which, as described above, is placed between the foils, preferably comprises a two dimensional matrix of non-conductive separation lines, vertical **70** and horizontal **72**, configured to match the pattern of the electromagnetic conductors. The matrix preferably comprises air gaps **74** located between the non-conductive separation lines. The separation layer **64** avoids short circuits within the sensor by preventing the electromagnetic lines from touching each other or touching any of the pressure sensitive stripes on the opposite foil and by normally preventing the pressure sensitive stripes on the respective foils from touching each other.

[**0118**] In addition, the matrix is of resilient material. The separation layer **64** enables pressure sensing by creating a physical gap between the vertical and the horizontal conductive stripes, thus preventing the stripes from touching each other when no pressure is applied, as mentioned above. However application of pressure squeezes the matrix, causing the stripes of the upper and lower layers to be brought into contact in the region of the air gaps **74**. At the same time, no contact is brought about between adjacent electromagnetic lines since the separation lines of the matrix provide a non-conducting separation therebetween, which is retained even upon application of pressure.

[**0119**] Patterning on the separation layer **64** preferably substantially matches the pattern of the electromagnetic conductors, with a certain amount of additional margin. The separation layer may thus comprise squares or rectangles of non-conductive mask. The mask is preferably printed onto the foil layers, using transparent non-conductive adhesive, as part of the sensor production process. As an alternative it may be etched from a layer of non-conductive material applied to the foil. Apart from transparent non-conductive adhesive, other transparent or semi-transparent nonconductive materials may also be suitable, transparency and semi-transparency being considered relative to the layer thicknesses used in the foil. Furthermore, as the electromagnetic conductors are particularly thin, it may be possible to make a mask of opaque materials without interfering with viewing of the screen, and such an embodiment may be particularly suitable for certain industrial applications such as CNC devices where minor interference with vision is not critical.

[**0120**] In an alternative embodiment of the present invention the separation layer **64** comprises a mask of spacer dots. A high density of such spacer dots is placed in the regions of the electromagnetic conductors, preventing them from touching each other or touching the pressure sensitive stripe. A lower density of dots is placed in the regions of junctions between the pressure sensitive stripes, sufficient to prevent the stripes from touching each other when no pressure is applied but enabling easy contact upon touch pressure. In another preferred embodiment no dots are provided over the junction regions.

[**0121**] Reference is now made to **FIG. 7**, which is a simplified block diagram of a preferred embodiment of the digital processing unit **16** of **FIG. 1**. The digital processing unit **16** comprises two interfaces, a touch interface **80** and an EM interface **82**. The touch interface **80** provides signals and receives inputs from the sensor touch conductors. The EM interface **82** operates in conjunction with the front end ASICs **14** which receive signals from the EM sensors. The EM interface receives serial inputs of the signals as sampled at the various front-ends **14** and packs them into a parallel representation. Digital signal processor (DSP) **84** is connected to both the touch and EM interfaces and processes data from the respective interfaces to determine the positions, both of physical objects such as styluses being detected by the EM subsystem and positions of finger touches being detected by the touch subsystem. The positions as calculated by the DSP are sent to the host computer via a link, for example a serial link **86**. The DSP is preferably associated with a flash memory **88** and RAM **90**. DSP operating code is preferably stored in the Flash memory **88** and sampled data is preferably stored in the RAM **90**. Signal generator **91** provides trigger signals for the EM subsystem.

[**0122**] In a preferred embodiment, the touch interface **80** is implemented by a PLD (Programmable Logic Device). Each pressure stripe is directly connected to one of the PLD IO pins, which can be used both as an input and an output. Alternatively, bi-directional buffers may be located between the PLD and the sensor conductors, to amplify input and output signals.

[**0123**] Reference is now made to figure number **8**, which is a simplified schematic diagram showing apparatus for detecting a single touch. A PLD **91**, implementing the touch interface **80** as discussed above, outputs a signal, typically a