comprising at least two display layers at least in part overlapping in which at least one of said display layers has a dissimilar configuration such as (without limitation) dissimilar pixel and/or sub-pixel patterns to the other display layer(s) such that moiré interference is reduced and moiré interference is additionally reduced through the use of at least one transmissive, light diffusing interstitial layer between display layers.

[0046] According to one aspect of the present invention there is provided a method of making a multilayer display system wherein:

[0047] a) Image formation layers are chosen so as to render the moiré interference produced substantially indistinguishable to the human visual system;

[0048] b) Different pixel patterns may be chosen on the front and rear image formation layers to prevent the formation of Moiré fringe patterns substantially distinguishable to the human visual system;

[0049] c) Different sub-pixel patterns may be used on the front and rear image formation layers to prevent the formation of Moiré fringe patterns substantially distinguishable to the human visual system;

[0050] d) Sub-pixel patterns may be contained within a tessellated geometric pattern where the edges of the sub pixels may be curved and the shape of the sub-pixels may be chosen to avoid moiré interference;

[0051] e) On one or all image formation layers for each sub-pixel may typically surrounded by sub-pixels of a different colour;

[0052] f) Sub-pixels and pixels may be arranged on one or both screens in a tessellated pattern to simplify manufacture and to optimise the connections to the rows and columns;

[0053] g) The slope of the borders of the pixels formed on a previous screen may be at an angle between 1 degree and 90 degrees to those of a subsequent screen;

[0054] h) The slope of the borders of the sub-pixels formed on a previous screen may be at an angle between 1 degree and 90 degrees to those of a subsequent screen; and/or

[0055] i) Interstitial layers are placed between the image formation layers so as to prevent the formation of moiré interference whilst not producing changes in the sharpness, brightness and chromatic features of the image formation layers, which are substantially distinguishable by the human visual system;

[0056] In theory, moiré interference in layered displays appears when geometrical patterns with a similar spatial frequency are overlaid. The resulting interference occurs as a variation in density of the interfering elements and has a much larger period than the contributing patterns. In multilayered displays this description can divide further by considering three separate geometric patterns which can be, depending on the technology employed

[0057] a) the black pixel matrix

[0058] b) the column and row lines and other opaque driving electronics

[0059] c) colour filters

[0060] The interference between subsequent black pixel matrices appears as a periodic variation in the density of the black lines in both the horizontal and vertical directions. And while individual lines may be too small to be detected when each pattern is viewed separately, the periodic variation in density may be detectable and is often annoying to the viewer. The same can be said for the driving electronic matrix.

[0061] The interference between subsequent colour filter elements appears as sets of large fringes, each set composed of distinct colours similar to those in the contributing pattern. Individual fringes appear when colour filters of the same type appear overlapping or partially overlapping to the viewer. The perceived colour of the fringes is less saturated than that of the contributing filters because overlapping of dissimilar colour filters does not produce black.

[0062] In order to achieve minimal moiré interference perception the contrast and spatial frequency of the moiré fringes produced needs to be below the threshold of the human visual system. Since the frequency of the moiré interference varies depending on the viewing distance and the distance between the layers and it is preferable that these parameters free for other purposes, counter measures need to be directed towards lessening the contrast of the interference.

[0063] To achieve minimal contrast in the resulting fringes by the layers the shape of the colour sub-pixels on separate layers has to be chosen carefully, so that when the patterns are overlaid there is minimal variation in the area of intersection of the colour stripes as one moves along the horizontal or vertical axis of the display. The patterns may be formed by dividing the simple geometric shapes forming the tessellation into different sub-pixel regions with straight or curved borders.

[0064] Whilst using dissimilar pixel and sub-pixel arrangements may be a useful counter measure to moiré interference additional, although minimal blurring of the sub-pixels may still be necessary to reduce the contrast of the moiré fringes and hence make them imperceptible to human visual system, this is best achieved with a directional diffuser. The simplest form of which is made by interfering a plane or diverging wave with a diffuse wave in either a reflection or transmission format. The resulting hologram will reconstruct the diffuse source when illuminated at the original angle. The position and size of the original diffuse source will determine the projection zone and the gain of the screen. A small diffuse source recorded a meter away from the holographic plate will form a very high gain screen that is visible only when the viewer is in the angular zone subtended by the small source at 1 meter.

[0065] The directional diffuser effectively blurs the image by taking light emitted by the image and randomly changes its direction by an angle somewhere between zero and the projection angle. Since the directional diffuser is placed at a particular distance from the image formation layer light appears to have come from a point a small distance from its actual origin. By changing both projection angle and the distance from the image formation layer, both the gain of the display and image blur size can be controlled. The image should be spread as uniformly as possible over a distance of at least one pixel, thus decreasing the contrast of the small features that contribute to the moiré interference and hence