[0055] Preferably, said features include diffusion dots, predetermined scratches, indentations protrusion, regular or irregular undulations and the like.

[0056] Preferably, at least one light source is located along said peripheral boundary.

[0057] According to one aspect of the present invention, said light source is a cold cathode fluorescent tube. In an alternative embodiment, the light source may be light emitting diodes (LEDs).

[0058] The use of a light guide as the transparent emissive layer differs from known utilisations of such materials, which have hitherto been utilised solely for illumination purposes, though without using its transparent properties as part of the optical pathway of a display.

[0059] Preferably, said emissive layer is configured to refract the ray axis of light at the said peripheral boundary such that the peripheral boundary between adjacent screens is not visible along said viewer's sightline.

[0060] According to one aspect of the present invention, the said features are distributed with increasing density as a function of distance from said light source. Preferably, said function is quadratic.

[0061] According to an alternative embodiment of the present invention, the said prescribed thickness of the emissive sheet is reduced as a function of distance from a said light source.

[0062] According to an alternative embodiment of the present invention, said emissive layer is formed from a transparent organic light emitting diode (TOLED) assembly.

[0063] The use of light guides and TOLED assemblies in multi-layer displays are described in the applicants co-pending New Zealand Patent Application No. 514500 incorporated by reference herein.

[0064] A further advantage of the present invention relates to the existing problem of parallax error created by viewing the composite image from an off-fixation axis angle. Existing combination displays suffer from pronounced parallax effects for off-axis viewing due to the degree of physical separation between the two displays.

[0065] Any means of increasing the acceptable viewing angle of a display greatly enhances the display's usability. Whilst viewing a display, particularly computer monitors and the like, from large off axis angles is unusual, it is entirely normal for a viewer to move their viewpoint to a limited degree.

[0066] Parallax error reduces the effects of 'depth fusion' as this implicitly requires the images on different screens to be substantially aligned. The effects of parallax are reduced by the present invention by two features.

[0067] Firstly, reducing the physical separation between displays by physically stacking in an overlapping alignment produces a significant reduction in parallax in comparison to that of 'combination displays' as described above.

[0068] Secondly, in a further embodiment, parallax effects are attenuated by interposing a refractor between the said imaging screens.

[0069] Preferably, said refractor has a greater refractive index than air. It is possible, the display may be operated in a medium other than air, in which case, said refractor has a refractive index greater than that of said medium.

[0070] Thus, according to a further aspect, the present invention further includes a refractor interposed between at least two said imaging screens, wherein said refractor is formed from a material having a greater refractive index than that of a medium immediately adjacent the display exterior.

[0071] To an observer viewing the display image from a non-orthogonal angle to the display screen, the light from the rear screen would appear to originate from a point closer to the front screen due to the refraction by the refractor.

[0072] It will be appreciated that the function of the refractor may be incorporated into the said emissive layer. The refractor may be formed integrally with an emissive layer such as a light guide or may consist of a separate refractor attached to the emissive layer.

[0073] According to one embodiment the said imaging screens are liquid crystal display (LCD) screens.

[0074] However, it will be understood that the invention is not necessarily restricted to the use of LCD screens, and that any transparent or semi-transparent displays may be used for the display screens. A non-transparent display technology may be utilised for the rear imaging screen.

[0075] Thus, by virtue of the configuration of the applicant's displays described or referred to herein, it is possible to readily add further display screens to enhance the number of image planes on which physical images may be formed. It will be appreciate that non-depth fused images may also be displayed on one or more of said screens.

[0076] The incorporation of an emissive layer, such as a light guide, between display screens further facilitates the addition of multiply overlapping display screens. The transmissive losses associated with light passing through each additional display may be countered by the added illumination provided by the emissive layers.

[0077] The present invention may be utilised in any application where the ability to vary the perceived depth, or degree of projection of an image is beneficial such as providing contouring effects for maps. It has also been found the effects of depth fusion are particularly effective with images of ill-defined borders such as clouds, smoke and so forth.

[0078] The principle by which the human brain perceives an image in front of, between, or behind the various image planes of a multi-screen display is believed to relate to the mental processing of the two-slightly different retinal images observed by the viewer's eyes. It is useful to utilise the mathematics of Fourier analysis/transforms and the like as a means of comprehending the human preceptions and to quantify the effect.

[0079] As is well known in the art, Fourier synthesis provide a means of composing any repetitive waveform from the weighted sum of appropriate sine waves of appropriate amplitude and phases.

[0080] The inverse of this process;—Fourier analysis, is the process of braking a waveform into its constituent sine