[0037] 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.

[0038] The above configurations of the said feature distribution and emissive sheet thickness both provide a means of outputting a uniform light intensity, avoiding decreasing intensity with distance from the light source.

[0039] According to one embodiment of the present invention, said emissive layer is formed from a light guide.

[0040] According to an alternative embodiment of the present invention, said emissive layer is formed from a transparent organic light emitting diode (TOLED) assembly.

[0041] A TOLED emits light uniformly from both sides and does not necessarily require the above-described means of controlling the light intensity distribution via said defined features and the like.

[0042] However, the fact that light emits from both sides of a TOLED can in-itself cause degradation of the image seen by the viewer. This is due to the fact that light emitted upwards through transparent portions of the front LCD panel towards the viewer will be transmitted with equal intensity, irrespective of whether the rear LCD panel is displaying a clear or black region at any given point on the rear screen.

[0043] Whilst this causes no drawback for the transparent portions of the rear screen, black regions (e.g. text) appear grey, with reduced contrast to an adjacent transparent region. The light emitted from the TOLED has no means of being directly varied according to whether it is aligned or overlays a portion of black text on the rear screen.

[0044] This drawback is addressed by the use of a wire grid polariser and a polarised TOLED, i.e. a TOLED emitting polarised light. Optionally, an optical retarder may also be incorporated. This combination (described below) effectively re-cycles the light radiating directly upwards from the TOLED and re-orientates the polarisation of the light to maximise the illumination of the displays without degrading the display contrast

[0045] Thus in a preferred embodiment of the present invention, said emissive layer is a polarised TOLED emissive layer located between a front screen and a rear screen, wherein a wire grid polariser and is interposed between the TOLED and the front screen. As used herein, the front and rear screens are defined with respect to the physical proximity of a user viewing the displays in a conventional manner, i.e the front screen is nearer to the user than the rear screen. One or more additional screens may be located between the said front and rear screens.

[0046] Polarised light is emitted from both surfaces of the TOLED, with the upward/outward emissions potentially degrading the clarity, contrast and/or effectiveness or the composite image formed by all the overlapping display screens.

[0047] Wire grid polarisers are defined herein to include any polariser capable of transmitting P polarised light whilst reflecting S polarised light or vice versa.

[0048] Polarization is defined relative to the plane of incidence, i.e. the plane that contains the incoming and reflected rays as well as the normal to the sample surface.

[0049] S polarization is where the electric field is perpendicular to the plane of incidence, while for P polarization, the electric field is parallel to the plane of incidence.

[0050] Wire grid polarisers may be formed from a variety of materials and manufacturing techniques, though they generally include a regular formation of spaced lines formed on a transparent substrate or film.

[0051] The strips may be an array of extremely fine metal wires deposited on a face of an optically transparent window such as KRS-5 or ZnSe. Since the electric field of the light oriented along the direction of wires can induce electrical currents along the wires, the wire grid acts as a metal surface reflecting virtually all the radiation polarized along the direction of the wires. The electric field perpendicular to the direction of wires is unable to induce electrical current in the wire grid. Thus, the light transmits through the polariser with only the reflectance losses from the substrate window.

[0052] In alternative constructions, precisely spaced groves are ruled directly into a highly polished CaF_2 or ZnSe substrate which is then aluminised. Holographic methods may also be employed to produce grooves for holographic wire grids.

[0053] Thus, wire grids have the property that incident light of a given polarisation may pass through the polariser, whilst light of orthogonal polarisation to said given polarisation is reflected reciprocally. It follows therefore, that if a wire grid polariser is illuminated by light polarised in the same direction as the polarisation axis of the grid, all the light will be reflected. Conversely, polarised light orientated orthogonally to the polarisation axis of the wire grid will be transmitted through the grid. However, polarised light incident on the wire grid polariser.

[0054] In one embodiment therefore, the polarisation axis of the wire grid is arranged to reflect polarised light emitted from the TOLED back through the TOLED towards the rear screen.

[0055] Preferably, said rear screen is a cholesteric LCD display.

[0056] In one embodiment, the reflected light passes through a quarter wave retarder before being reflected by said rear screen. This produces a quarter wavelength shift in the light, which is then reflected and circularly polarised by the rear display. However, it will be appreciated that retarders producing other degrees of retardation may be utilised, depending on the characteristics of the incident light and the display screens.

[0057] The light reflected by the rear display passes through the quarter wave retarder a second time before passing through the TOLED a second time to the wire grid polariser. The retarder applies a further quarter wave shift resulting in linearly polarise light. Regions denoting text or graphics on the rear display, i.e. those regions preventing the transmission of light, remain un-illuminated regions in the light reflected from the rear screen to the viewer.

[0058] The linearly polarised light then passes through the wire grid polariser and front screen polariser.

[0059] The above configuration thus effectively re-cycles the light emitted from the upper surface of the TOLED which would otherwise degrade the contrast and luminance of the image seen by viewer.