[0100] The configuration of the emissive layer (21) corresponds almost directly to the light guide (2) shown in FIG. 1 with exception that a lower reflector (4) is omitted. Light may be emitted from both planar surfaces from the emissive transparent light guide (21) to directly illuminate both LCD displays, (10, 20). However, preferably, only the lower planar surface of the light guide (2) is provided with a plurality of diffusion dots (7) to restrict the emitted illumination to the rearward display (10) only. The light is then reflected from the cholesteric liquid crystal in the rearward display (10) and is transmitted through the emissive layer (21) and front display screen (20).

[0101] Restricting the light emission in this manner ensures regions of text or graphics on the rearward screen (10) do not align directly with light emitted directly from the emissive display (21) through the front display (20) to a viewer with a corresponding reduction in contrast and greying/fading of tones.

[0102] In an alternative embodiment, the light guide (21) may be replaced by a transparent organic light emitting diode (TOLED) light source (30). FIG. 6 shows an existing TOLED backlight (30) composed of a further plurality of layers in the form of a transparent anode (31), a glass plate (32), a hole injection layer (33), a hole transport layer (34), an electron transport layer (35), a light generating layer (36) and a cathode (37).

[0103] Organic light omitting diodes are a recent entry in the field of display technology and is provide numerous beneficial characteristics for use in lighting applications. However, large area TOLEDs are not currently available, thus lending TOLEDs backlights to small area LCD displays and the like. The operating principle of a TOLED (30), as illustrated in FIG. 6 is based on electron-whole recombination. A glass plate (32) containing transparent anode (31) (usually an ITO) is employed as a substrate for depositing small molecules in a series of organic layers (33-36). Electrons are injected in the organic layers (33-36) by the cathode upon application of a DC voltage beyond a critical threshold voltage. Holes are correspondingly injected into the organic layers (33-36) by the anode (31). Electrons travelling through the electron transport layer (35) meet the holes from the anode (31) through the hole injection layer (33) and hole transport layer (34). The recombination of the electrons with the holes at the light-generating layer (36) creates "excitons" (excited neutral molecule) which subsequently fall back to ground state thereby releasing the recombination energy in the form of visible radiation.

[0104] The light-generating layer (36) may be doped with traces of specific organic molecules (dopants) in order to improve the efficiency of the generated light. The light generating layer (36) utilising dopants is generally called the "host" layer. Appropriate choice of dopants and hosts can lead to the generation of different colour light; white light may be created by two layers of hosts and dopants.

[0105] In order to utilise the TOLED (30) illustrated in FIG. 6 as an emissive transparent refractor (21), (as opposed to its role as a back light), it is necessary to specify that the cathode (37) is transparent in order that the emitted light may illuminate both the LCD screens (10, 20). Possible configurations of embodiments using TOLED (30) in place of a light guide (2) as the emissive layer (21) correspond to that shown in FIGS. 3-5, with the substitution of the TOLED (30) for the emissive transparent refractor (21).

[0106] By forming the rearward screen (10) to be enlarged with respect to the front screen (20), the refractive properties of the emissive transparent reflector (21) prevent the sight-line access of the viewer from detecting the actual edge boundaries of the rearward display (10) at shallow angles of incidence. This may be seen in FIG. 7 whereby emitted light rays (38 and 39) originating from object points (42, 43) respectively appear to originate from image points (40, 41) respectively. This prevents the peripheral edge of the portion of the combined display located between the separate LCD units (10, 20) being visible to the viewer. This also enhances the three-dimensional quality of the whole display (10, 20).

[0107] It will be appreciated that various alterations and permutations may be made to the display assemblies shown without departing from the scope of the invention. For example, two or more further displays (20) may be added to an existing display (10) to provide yet further available display area, each display with or without an associated emissive transparent refractor (21).

[0108] Although the above embodiments refer to the use of a liquid crystal displays, it will be understood that these are not essential and that any alternative displays technologies may be employed, whether non-emissive or self-emissive, provided the or each front display is at least partially transparent.

[0109] FIG. 8 shows a yet further embodiment of the present invention, addressing a shortcoming of the above-described TOLED-based embodiment. As light is emitted equally from both surfaces of the TOLED, areas of the TOLED overlapping regions of text or graphics on the rearward screen (10) will appear grey (in the case of a display using monochrome LCD screens) instead of black, due to the extra luminance emitted towards the viewer by TOLED. As the light transmitted from the TOLED through front screen (20) has no interaction with the rearward display (20), it is impossible to overcome this drawback without intervening in the optical path of the light. Unlike a light guide (2), it is difficult to restrict the emission of light to only one surface without affecting the transparency of the TOLED (30).

[0110] This difficulty is overcome in the embodiment shown in FIG. 8 by incorporation of a wire grid polariser (44) between the TOLED (30) and the front (20) screen and an optical retarder (45) located between the TOLED (30) and rearward screen (10).

[0111] The passage of light emitted from the TOLED (30) layer is described with reference to stages 46-53 with reference to the associated Jones vectors and matrices.

[0112] In this embodiment, the TOLED (30) is configured to emit polarised light. Initially, light is emitted (stage 46) from both sides of the TOLED (30) towards the front (20) and rearward (10) displays, each represented by the Jones Vector (46) of

$$0.5\begin{bmatrix}1\\0\end{bmatrix}.$$

[0113] The light (47) emitted towards the front display (20) is reflected from the wire grid polariser (44) and passes