task consisting of locating an intermediate-sized target amongst large and small distractors tested the scrial nature of the search whereby the target was embedded in the same plane as the distractors and the preattentive nature of the search whereby the target was placed in a separate depth plane to the distractors.

[0015] The relative influence of the total number of distractors present (regardless of their depth) verses the number of distractors present solely in the depth plane of the target was also investigated. The results showed a number of interesting features including the significant modification of the response time resulting from the target presence or absence. In the target absence trials, the reaction times of all the subjects displayed a direct correspondence to the number of distractors whilst the target present trials did not display any such dependency. Furthermore, it was found that the reaction times in instances where distractors were spread across multiple depths were faster than for distractors located in a single depth plane.

[0016] Consequently, the use of a plurality of depth/focal planes as a means of displaying information can enhance preattentive processing with enhanced reaction/assimilation times.

[0017] Although not restricted to the exclusive use of same, LCD screens are particularly suited for use with the applicant's display technology. As is well known in the art, LCD screens are typically configured with crossed polarisers on either side of the liquid crystals layer. This configuration would therefore block the passage of light through two or more successive LCD screens arranged with identical polarisation axes.

[0018] In one means of addressing this problem, the applicants place a bi-refringent film between adjacent LCD screens. This film transforms the polarisation of the light coming from the rear LCD screen from linear polarisation to elliptical polarisation, before it passes through the front LCD screen. This enables the viewer to see an image displayed on the rear LCD screen through the front screen as the effect of the orthogonal polarisers is overcome.

[0019] However, further problems occur with the introduction of this extra element. Bi-refringent films do not have a uniform thickness even though the variance is only in the range of micrometres. Therefore, the different wavelengths of incident light such as that comprising 'normal' white light results in polarisation ellipsoids of different axial ratio and/or tilt angle, after transmission through the aforementioned bi-refringent film. Therefore, varying amounts of light of different wavelengths will pass through the polarisers of the front LCD, and the user will see bands of colour.

[0020] A further problem of viewing one LCD screen through another LCD screen is that the viewer's perception of the electronic tracery pattern used to address each of the pixels on the LCD screen. The combination of viewing the tracery on the back screen overlaid with the tracery on the front screen causes moiré interference patterns which are very noticeable and unwelcome to the viewer.

[0021] In order to address the above-described problems, the applicants formed the bi-refringent film with optically diffusive properties, by etching a matt surface onto one side of the film. This remedies the visual colour anomalies, and the viewer's perception of the tracery on the rear screen. Thus, it can be seen that the introduction of a diffuse element to this technology plays a pivotal role in producing an optically usable multi-LCD screen display.

[0022] It is important that the diffuse bi-refringent element is located close to the rear screen to provide the viewer with the greatest divergence of light and thereby providing a wider viewing angle.

[0023] A necessary effect of the diffusive nature of the bi-refringent film is a slight blurring of the image on the rear LCD screen. The optimum level of diffusion is the minimum amount that renders the appearance of moiré interference patterns invisible or insignificant. Further diffusion or blurriness is not only unnecessary but detrimental to the perceived quality of the image on the rear screen and hence that of the combined multi-screen display system.

[0024] The blurring of the rear screen is compounded by the way that LCD manufacturers presently manufacture their screens. At present, almost all LCD manufacturers produce screens that have a matt surface on one or both sides. This matt surface is intended to reduce glare on the LCD screen by randomly scattering the light reflected off the front of the LCD screen, so that a mirror-type reflected image is not perceived by a viewer. This matt finish may also be on the rear surface of the LCD screen to help to diffuse the screen's normal backlight source.

[0025] Unfortunately, this also increases the diffusion of the light being emitted by the rear screen when this standard LCD screen, with matt finish applied to the front and/or rear surface, is used with the applicant's technology as described. This results in an unnecessarily blurred rear image thereby restricting the utility of the 3-dimensional display.

[0026] It is an object of the present invention to address the foregoing problems or at least to provide the public with a useful choice.

[0027] Further aspects and advantages of the present invention will become apparent from the ensuing description which is given by way of example only.

DISCLOSURE OF INVENTION

[0028] According to one aspect of the present invention there is provided a method of converting a matt surface of a front screen of a multi focal-plane display configured with two or more optically overlapping screens, characterised by the step of altering the matt surface to provide the front screen with an optically smooth surface.

[0029] The, or each screen may be any type of screen used in known display technology such as, for example, a glass or plastic surface used with cathode ray technology and so forth. Reference throughout this specification to a screen being an LCD (liquid crystal display) screen is purely exemplary and should not be viewed as limiting in any way.

[0030] The term 'matt surface' as used herein denotes a surface which diffuses light to a greater degree than an optically smooth or glossy surface.

[0031] The matt surface typically used in display technologies (for example LCD screens) has an optically rough or irregular surface composed of numerous pits and bumps. The combined effect of this irregular surface together with differing refractive index between the surface material and