the next to form a stacked or sandwiched construction. The scene to be displayed consists of a hilltop, the moon, and the nights sky (**3***a, b* and *c*), which are displayed upon the display device. Light enters from a backlighting system (not illustrated) behind the transmissivity control device (**4**). The transmissivity control device controls this light, selectively in the localised area of the images. As such the resultant light exiting the transmissivity control device in the case of the moon (**5***a*) is bright and saturated in yellow colour (colour not illustrated), and in the case of the hilltop the resultant light less intense and less saturated in colour (**5***b*). Light entering the transmissivity control device in the localised area of the night's sky is blocked to the greatest degree possible (if not completely) by both the transmissivity control device and the display device. The resultant image displayed on the display device has increased contrast ratio particularly between the moon and the night's sky and additionally the colour of the images is more vibrant.

[0103] In the preferred embodiment illustrated the display comprises two LCDs which are stacked in construction. Those LCDs are preferably colour LCDs, although alternatively it is less expensive to use a grey-scale LCDs. In particular a grey-scale LCD acting as an transmissivity control device can be used in combination with a colour LCD acting as a display device. This colour LCD/grey-scale LCD combination or multiple grey-scale LCD combination will effectively control illumination of the images but will add little to the colour enhancement attributes described in the current invention and as such contrast ration is effectively controlled but not colour saturation or other colour characteristics.

[0104] In this preferred embodiment of two layered LCDs moiré interference may result due to the layering of like patterns and this may be overcome or limited through the use of a light diffusing device such as an random homogenous layer placed between the LCDs and such interstitial layers need to be factored in which determining the transmissivity of layers of the multi layer display device.

[0105] Alternatively the LCD in front (from the viewer's perspective) is used as the illumination controlling device and the LCD in the rear is used as the display device.

[0106] Preferably the LCD layers are constructed so that there is as little distance as possible between the two layers.

[0107] In this preferred embodiment of two stacked LCD layers can be used in their normal way as addressable image display devices and can be attached to a CPU or other device driver. As such the many software applications for content production and editing can be used in conjunction with the present invention.

[0108] In this preferred embodiment of two stacked LCD layers the rear layer can be used as both for the purpose contrast and colour enhancement as described in this invention and also if those layers are displaced by distance the embodiment can be used for the purpose independent image display such that different images can be displayed on the front and rear layers with depth enhanced perception.

[0109] In a further preferred embodiment, the enhancement of contrast ratio and colour takes place on the basis of user interaction. This user interaction embodiment involves attaching the display to a CPU or other device driver such that the user can determine the level of illumination control he or she requires to enhance the images displayed on the display device—in terms of brightness, contrast, hue, colour temperature and of colour. The user is able to interact with a software application, specifying the brightness and colour he or she wishes to be perceived when the image is viewed and the software application drives both the transmissivity control device and the display layer to display an image with those specified characteristics. He or she may preferably control the gamma curve of each layer utilised in calculating transmissivity of that layer. Preferably the level of illumination and colour control the transmissivity control device exhibits is controlled by a sliding scale controlled for example by a mouse of key-strokes with which the user interacts. Alternatively the device with which the user interacts can be hardwired and the user interacts with physical sliders or knobs.

[0110] Utilising this preferred embodiment of user interaction, colour and contrast enhanced images or indeed entire movies could be pre-recorded for playback using a CPU or other device driver such as a DVD. The viewer of this preferred embodiment would largely be unaware of the mechanisms controlling such enhancement of colour and contrast but would enjoy an improved viewing experience.

[0111] **FIG. 2** illustrates a flowchart diagram of information flows and steps executed by software to display images with improved colour and contrast characteristics. In **FIG. 2** execution starts a block A which is the step of an image file being present in an addressable format (preferably Red Green Blue format). The flowchart proceeds to block B which is the processing stage. Processing of an image is undertaken either on the basis of user defined preferences or on the basis of pre-defined settings whereby the contrast or illumination and the colour or chromaticity is defined. The processing stage then presents two pieces of information from one of which is the information required to drive the transmissivity control device (C) for display on the transmissivity control device (D). The other information presented by the processing stage is the information required to drive the display device (E) which is displayed on the display device (F). Obviously the combination of the user controlled contrast ratio and colour enhancement embodiment with the two stacked LCD layers embodiment would allow the user/content developer to precisely control the viewing characteristics of the image to be displayed.

[0112] **FIG. 3** illustrates a sample image control software panel associated with a preferred embodiment where there is an is an application that reads the display screen, calculates a value, optionally corrects it, outputs the value to an appropriate information transferral port, and optionally corrects the display gamma.

[0113] The calculated value is the average grey level of the subpixels in the area intended to be changed or modified. Gray is calculated using:

```
grey=red*0.3+green*0.59+blue*0.11
```

The calculation is performed according to a timer which can be initiated, for instance, every 100 milliseconds. However, if the calculation takes longer than 100 milliseconds then the calculation is done less frequently. The time for each frame calculation is displayed in the "Time to compute frame" readout in the sample control panel figure (**FIG. 3**).

[0114] For instance, as a default setting, the application could be set to read every eighth pixel, horizontally and