select and drive a sub-pixel element in the display. Other circuits are also possible, such as TFT (thin film transistor) circuits.

[0023] Notwithstanding the foregoing specific examples discussed, in embodiments of the present invention, the sub-pixel and/or pixel element need not be of any particular type, and may include, by way of example only, OLEDs, electro-chromic devices, electronic ink, or any device that changes its optical properties or appearance when electricity is applied to the device. It is further observed an active matrix arrangement as described above could be used as an imaging system where the sub-elements are photosensitive and the data lines are read by the controller **220** as opposed to driven by the controller **220**. In such a manner, embodiments of the present invention may also be used as an imaging system to, for example, record the faces of observers looking at the display.

[0024] In embodiments where paper is used in the carrier material **110**, electro-chromic devices may be used to create a reflective display device **130**. Such embodiments may comprise a pixel arrangement akin to the four-color process for printing. The four basic colors used to create the exact color specified by a graphics application program are generally referenced as CMYK. "C" represents Cyan or blue, "M" represents magenta or red, "Y" represents yellow, and "K" represents black. To support the generating of these colors, four sub-pixels may be used unless the color purity of the Cyan, Magenta and Yellow devices is adequate to produce black when combined in equal or nearly equal proportions. While the display device **130** may use addressing in a similar manner to that described above in connection with an active matrix, the image generated may need to be translated from RGB (Red Green Blue as used in emissive displays) format to CMY or CMYK format. This translation is well known in the computer application software art. In any regard, the basic electro-chromic device may comprise a two-electrode device, where each electrode comprises a blend of conductive polymers with electro-chromic properties appropriate for producing color variations at different applied electrical potentials. The active matrix transistor circuits can be printed on the carrier material **110** with inks formulated from organic semiconductors and/or conductive polymers.

[0025] **FIG. 4** illustrates an example of an electro-chromic cell **410**. A cross-sectional view of the cell **410** is shown **FIG. 4A**. An electrode **420** is deposited onto a substrate **450** along with a counter electrode **430** that is smaller in area but thicker than the electrode **420**. A solid or semi-solid electrolyte **440** is place over the two electrodes. Possible solid electrolytes include but are not limited to polyacrylamide, polyethyleneoxide, and polystyrenesulphonate, and Nafion. Nafion belongs to the wide class of solid super-acids catalysts, in that it exhibits acid strength greater than that of 100% H_2SO_4. It has hydrophobic (—CF_2—CF_2—) and hydrophilic (—SO_3H) regions in its polymeric structure, and its super-acidity is attributed to the electron-withdrawing effect of the perfluoro-carbon chain acting on the sulfonic acid group. By applying a potential across the electrodes the reflectance of the electrode **420** will vary with the magnitude of the applied potential. Electrode materials include, by way of example only, conjugated polymers films such as 3,4-ethlyenedioxythiophene:poly(styrene sulfonate) (PEDOT:PSS), polyaniline, polypyrrole, and other conductive polymers which possess electro-chromic properties.

[0026] **FIG. 5** and **FIG. 5A** show a top view and a cross sectional view, respectively, of an example of an electro-chemical transistor **500** that may be used to produce a transistor circuit for active matrix addressing in an active matrix display that may utilize electro-chemical cells such as the electro-chromic cell **410** described above. The transistor **500** is formed by printing a "T" shape area of conductive polymer to form the drain **550**, source **510**, and one of two gates **520** for the transistor. A second area of conductive polymer in the shape of a rectangle is printed to form the second gate **540** contact. Conductive polymers used to make the electrodes for the electro-chromic cells can also be used to product the transistors and include, by way of example only, conjugated polymers films such as 3, 4-ethlyenedioxythiophene:poly(styrene sulfonate) (PEDOT:PSS), polyaniline, polypyrrole, and other conductive polymers which possess variable electrical properties depending upon the doping state of the polymer which can be controlled by applying varying potentials across the two gate contacts. A layer of solid electrolyte **550** is placed over the polymer electrodes to provide a source of ions, which move in and out of the polymer film to change the film's electrical properties. Possible solid electrolytes include but are not limited to polyacrylamide, polyethyleneoxide, polystyrenesulphonate, and Nafion. The solid electrolyte is then covered with an encapsulation layer **560**.

[0027] As noted earlier, embodiments of the electronic display device **130** may comprise an OLED (organic light emitting diode) structure. **FIG. 6** shows a side view of a portion of material **610** that could be used in a carrier material **110** according to embodiments. The material **610** may have formed therein pre-patterned wells **620** containing bank structures. The material **610** could include, for example, substances such as polyimide, polyetherimide, polyester, and polyethylenenapthalate. Amorphous silicon, polysilicon, or organic semiconductor TFT circuits **625** are formed at the bottom of the wells. The wells are then coated with a thin transparent conductor **630** such as ITO. One or more organic thin films or first polymer layer **640** in a thickness between 50 to 150-nm thick are deposited from solution using a printing technique. This first polymer layer **640** may be a non-emissive conducting polymer, polyethylenedioxythiophene (PEDOT) or polyaniline doped with poly-styrenesulphonic acid (PSS), which serves as a hole-injecting layer. A second polymer layer **650** may be deposited and may be an emissive polymer used to create either red, green or blue light. Examples of emissive polymers include Poly(p-phenylenes) PPP, Poly(phenylenes vinylenes) PPV, Dimethoxy-PPV, methoxy-ethyllhexyloxy-PPV, polyflourenes, dimethyl-polyflourene. Finally, a metallic cathode **660** may be deposited on top of the emissive layer **650**.

[0028] As noted earlier, the electronic display system according to embodiments of the present may be made with inexpensive materials, such that it would be in effect disposable. Accordingly, elements of the system could be specifically designed for a comparatively brief period of use. For example, the memory capacity of the system could be designed to hold only a small amount of data that is useful only for a short period of time.