

least one of exposed surface of the graphical imagery display device. The graphical image is affixed to the exposed surface of the electroactive device such that a sufficient voltage applied by the electromotive force generator to the plurality of electrodes causes the graphical image to dynamically change geometric shape in conformity with the deformation of the exposed surface to which it is affixed.

[0014] Various embodiments of the invention provides that the graphical image may be affixed using one of; a lamination process, a painting process, a dye sublimation process, a silk screening process, an adhesive process and any combination thereof.

[0015] Alternately, or in conjunction therewith, the graphical image may be disposed on a separate elastomeric membrane and the elastomeric membrane is then affixed to the exposed surface of the electroactive polymer device.

[0016] In a related embodiment of the invention, the change in geometric shape is an elongation in at least one dimension.

[0017] In related embodiments of the invention, the electromotive force generator includes a voltage waveform circuit configured to generate a waveform. The waveform includes at least one of; a sine wave, a square wave, a saw tooth wave, a triangle wave and any combination thereof. A modulator circuit may be operatively coupled to the electromotive force generator to modulate the waveform.

[0018] In other related embodiments of the invention, the at least one exposed surface is pre-stressed to allow greater geometric changes in the graphical image; application of the sufficient voltage causes the one exposed surface to become transparent allowing a second graphical image to be visibly perceived; and the electroactive polymer device is configured in a form factor of; a pushbutton, a curio, an ornament, a logo and any combination thereof.

[0019] In a second device embodiment of the invention, an electroactive graphical imagery display device comprises an electroactive polymer device. The electroactive polymer device includes a plurality of electrodes, at least one exposed surface and a generally planar form factor. An electromotive force generator is operatively coupled to the plurality of electrodes and a graphical image is affixed to the at least one exposed surface of the graphical imagery display device. The graphical image is affixed to the exposed surface such that a sufficient voltage applied by the electromotive force generator to the plurality of electrodes causes the graphical image to dynamically change geometric shape in conformity with a deformation of the exposed surface to which it is affixed.

[0020] In related embodiments of the invention, the sufficient voltage is greater than 100 volts; a modulation circuit is operatively coupled to the electromotive force generator and configured to superimpose a wave form on the sufficient voltage and the electroactive polymer device includes a plurality of independently controllable regions.

[0021] In another related embodiment of the invention, separate graphical images are affixed to each of the plurality of independently controllable regions.

[0022] In yet another related embodiment of the invention, the electroactive polymer device is coupled to one of; a page of a book, an article of apparel, signage, a curio and any combination thereof.

[0023] In a first methodic embodiment of the invention, a method of preparing an electroactive graphical imagery display device is provided. The method comprises providing an electroactive polymer device, providing an electromotive force generator, operatively coupling the electromotive force generator to the electroactive polymer device and affixing a graphical image to at least one exposed surface of the electroactive polymer device.

[0024] In related embodiments of the invention, the electroactive polymer device includes a plurality of independently controllable regions where separate graphical images are affixed to each of the plurality of independently controllable regions; the affixing may be accomplished using one of; a lamination process, a painting process, a dye sublimation process, a silk screening process, an adhesive process and any combination thereof.

[0025] In another related embodiment of the invention, the electroactive polymer device is configured in a form factor, the form factor being one of; a pushbutton, a curio, an ornament, a logo and any combination thereof.

BRIEF DESCRIPTION OF DRAWINGS

[0026] The features and advantages of the invention will become apparent from the following detailed description when considered in conjunction with the accompanying drawings. Where possible, the same reference numerals and characters are used to denote like features, elements, components or portions of the invention. Optional components or feature are generally shown in dashed lines. It is intended that changes and modifications can be made to the described embodiment without departing from the true scope and spirit of the subject invention as defined by the claims.

[0027] **FIG. 1**—depicts a perspective view of an embodiment of the invention.

[0028] **FIG. 1A**—depicts a first block diagram of an embodiment of the invention.

[0029] **FIG. 2A**—depicts a second block diagram of another embodiment of the invention.

[0030] **FIG. 2B**—depicts a third block diagram of yet another embodiment of the invention.

[0031] **FIG. 3A**—depicts a constant DC voltage implemented by an embodiment of the invention.

[0032] **FIG. 3B**—depicts a sine wave form superimposed on the constant DC voltage implemented by an embodiment of the invention.

[0033] **FIG. 3C**—depicts a sine wave form implemented by an embodiment of the invention.

[0034] **FIG. 3D**—depicts a square wave form implemented by an embodiment of the invention.

[0035] **FIG. 3E**—depicts a voltage ramp function implemented by an embodiment of the invention.

[0036] **FIG. 3F**—depicts a triangle wave form having a sine wave form superimposed over a triangle wave form implemented by an embodiment of the invention.

[0037] **FIG. 4A**—depicts a de-energized embodiment of the invention implemented on an article of apparel.