[0030] It will be understood that when an element or layer is referred to as being on another element or layer, the element or layer can be directly on another element or layer or intervening elements or layers. In contrast, when an element is referred to as being directly on another element or layer, there are no intervening elements or layers present. Like numbers refer to like elements throughout. As used herein, the term and/or includes any and all combinations of one or more of the associated listed items.

[0031] It will be understood that, although the terms first, second, third, etc., may be used herein to describe various elements, components, regions, layers and/or sections, these elements, components, regions, layers and/or sections should not be limited by these terms. These terms are only used to distinguish one element, component, region, layer or section from another region, layer or section. Thus, a first element, component, region, layer or section discussed below could be termed a second element, component, region, layer or section without departing from the teachings of the present invention.

[0032] Spatially relative terms, such as below or lower and the like, may be used herein for ease of description to describe the relationship of one element or feature to another element (s) or feature(s) as illustrated in the figures. It will be understood that the spatially relative terms are intended to encompass different orientations of the device in use or operation, in addition to the orientation depicted in the figures. For example, if the device in the figures is turned over, elements described as below other elements or features would then be oriented above the other elements or features. Thus, the exemplary term below can encompass both an orientation of above and below. The device may be otherwise oriented (rotated 90 degrees or at other orientations) and the spatially relative descriptors used herein interpreted accordingly.

[0033] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the invention. As used herein, the singular forms a, an and the are intended to include plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms Comprises and/or comprising, when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0034] Embodiments of the invention are described herein with reference to cross-section illustrations that are schematic illustrations of idealized embodiments (and intermediate structures) of the invention. As such, variations from the shapes of the illustrations as a result, for example, of manufacturing techniques and/or tolerances, are to be expected. Thus, embodiments of the invention should not be construed as limited to the particular shapes of regions illustrated herein but are to include deviations in shapes that result, for example, from manufacturing.

[0035] For example, an implanted region illustrated as a rectangle will, typically, have rounded or curved features and/or a gradient of implant concentration at its edges rather than a binary change from implanted to non-implanted region. Likewise, a buried region formed by implantation may result in some implantation in the region between the buried region and the surface through which the implantation takes place. Thus, the regions illustrated in the figures are schematic in nature and their shapes are not intended to illustrate the actual shape of a region of a device and are not intended to limit the scope of the invention.

[0036] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. It will be further understood that terms, such as those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0037] FIG. **1** is a cross-sectional view of a reflective unit according to an embodiment of the present invention. Referring to FIG. **1**, the reflective unit includes an electroactive polymer layer **107** which becomes strained when a voltage is applied thereto, a light reflecting unit **115** which deforms according to the strain of the electroactive polymer layer **107** and reflecting external light, and a light blocking unit **118** disposed over the light reflecting unit **115** which prevents external light from being reflected by the light reflecting unit **115** and absorbs light reflected off the light reflecting unit **115**.

[0038] The light reflecting unit **115** for reflecting external light includes reflecting cells **115***a* disposed on the electroactive polymer layer **107** and spaced apart from one another, and a distance between each of the reflecting cells **115***a* changes according to the strain of the electroactive polymer layer **107**. The light blocking unit **118** for preventing external light from being reflected by the light reflecting unit **115** and absorbing light reflected off the light reflecting unit **115**, includes blocking cells **118***a* arranged over the light reflecting unit **115** and spaced apart from one another.

[0039] The reflective unit controls the reflectance of light by controlling a voltage applied to the electroactive polymer layer **107**.

[0040] The electroactive polymer layer **107** is strained when a voltage is applied thereto. A first electrode **105** and a second electrode **110** apply a voltage to the electroactive polymer layer **107**. Once a voltage is applied to the electroactive polymer layer **107**, a stress is applied to the electroactive polymer layer **107** due to an electric field generated between the first electrode **105** and the second electrode **110**, and thus the electroactive polymer **107** is strained due to the stress. For the purpose of generating an electric field over as large an area as possible, the first electrode **105** may be disposed under the electroactive polymer layer **107** and the second electrode **110** may be disposed over the electroactive polymer layer **107**. Each of the first electrode **105** and the second electrode **110** may be formed of a flexible material so that they can be deformed when the electroactive polymer layer **107** is strained. The properties of an electroactive polymer are disclosed in R. Pelrine, et. al., Science. 287, 836 (2000). The degree of strain of the electroactive polymer layer **107** varies depending on what kind of polymer is used. The strain amounts for a variety of polymers are shown in Table 1.