

DISPLAY AND METHOD

The display is shown in the attached Figures 1 to 7. It is made using diode strips 10, which are made from a dielectric substrate having copper films 12, 14 laminated on both sides. The films 12, 14 are photo-imaged using known techniques to form an interconnection circuit 16 for a series of diodes 18 arranged in parallel in accordance with my earlier invention described in published International Patent Application, publication No. WO 01/65595 A3.

The several diode strips 10 are laid out so that the diodes constitute a pattern of seven diodes to form the various components of numerals, six such patterns are shown in the display, see Fig. 3 for a completed display. As shown in Figs. 1 and 2 and optical lens material 20 is coated over the diodes of each numeral pattern, to spread the light out evenly, to form a group of six trapezoidal segments 22, each overlaying a diode 18 and a middle segment 24 in the shape of a bar with pointed ends overlying the center diode. The segments are separated by a small gap 26, one from the other, to achieve segment definition.

The interconnection circuit for the diodes is brought out to the periphery of the display as output tabs or connectors 30 for connection to the required energy supply and programmable controller common for these displays. In Figs. 1 and 2 the connection tabs extend beyond the substrate as indicated by reference number 28. In Figs. 3 and 4, no copper film is present on the top and the interconnection circuit resides entirely on the substrate 10 and the various leads are brought out to a connection point 32 on the substrate and arranged in parallel to be coupled with a connector. In Figs. 6 and 7 the foil flange version of Figs. 1 and 2 is mounted in a flexible substrate 50 in a recessed cavity.

The preferred optical lens material is VACREL™, a photo-imagable polymer material used for the printed circuit technology. It is photo-imagable with a UV light source. Particulate material can be loaded into the polymer, such as silver particles or phosphors that spread the light evenly throughout the lens material to give a uniform smooth effect.

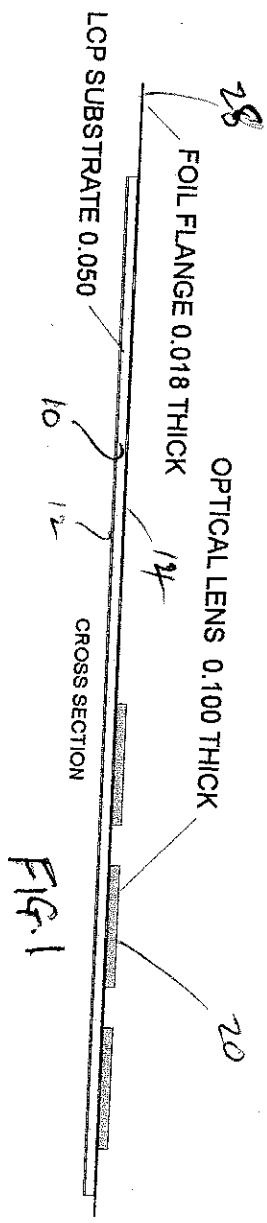


FIG. 1

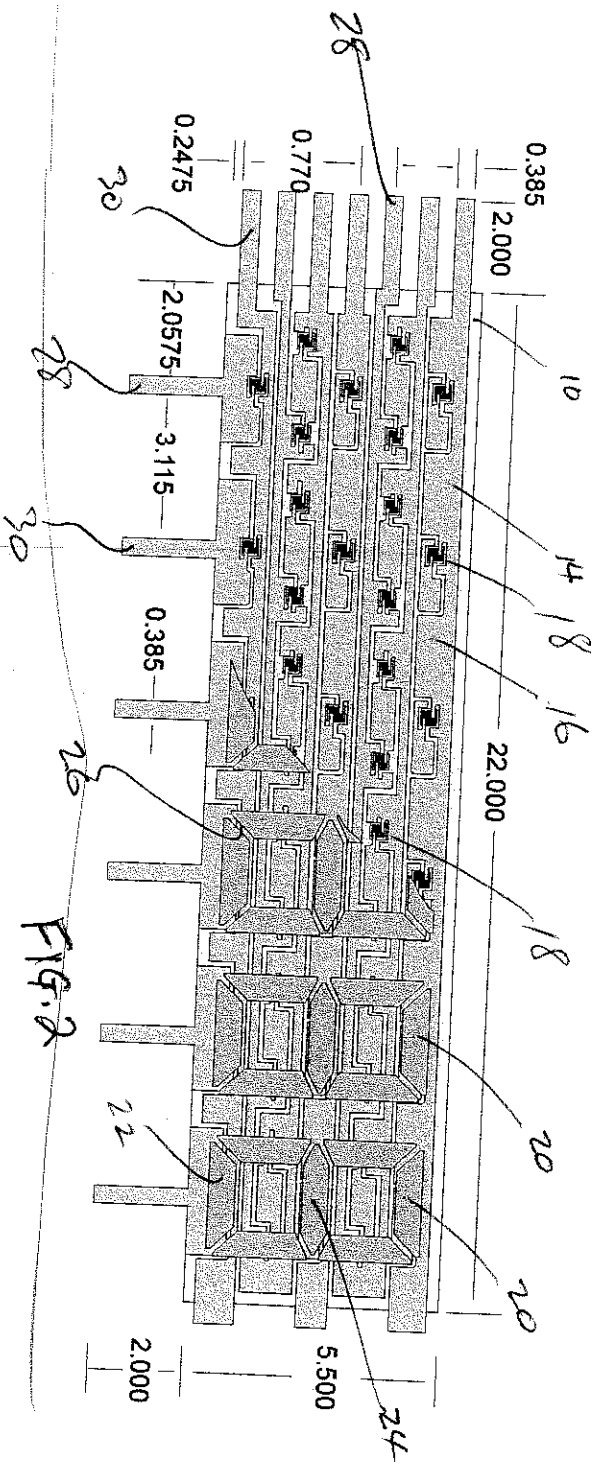


FIG. 2

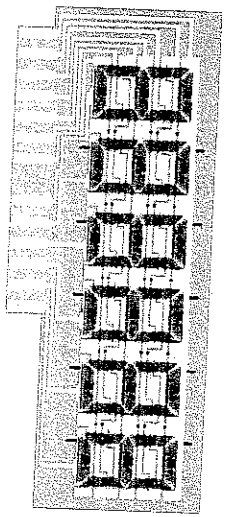


FIG. 3

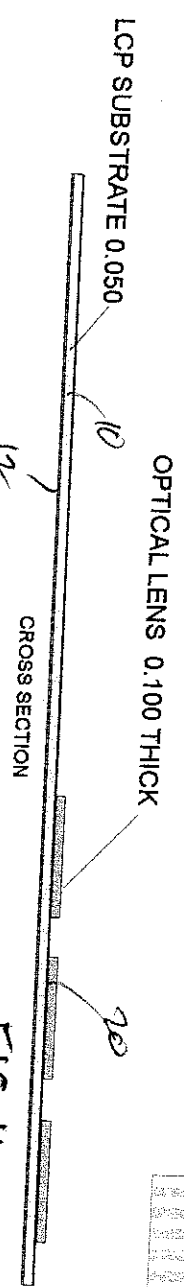


FIG. 4

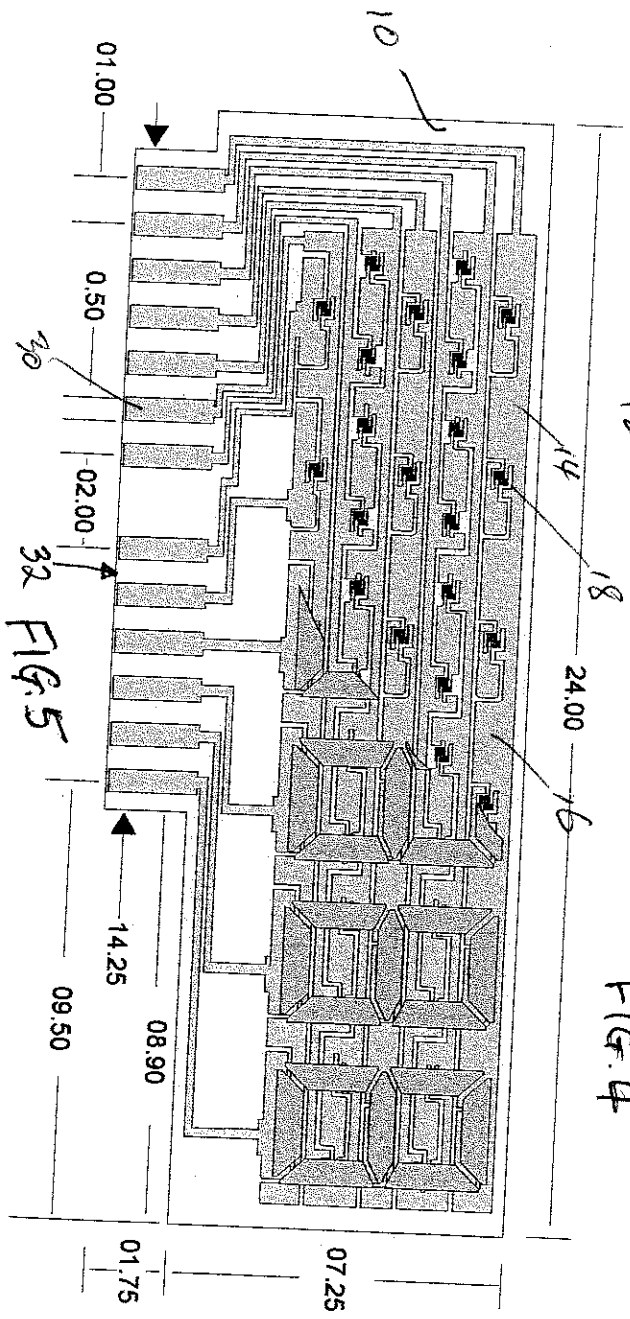


FIG. 5

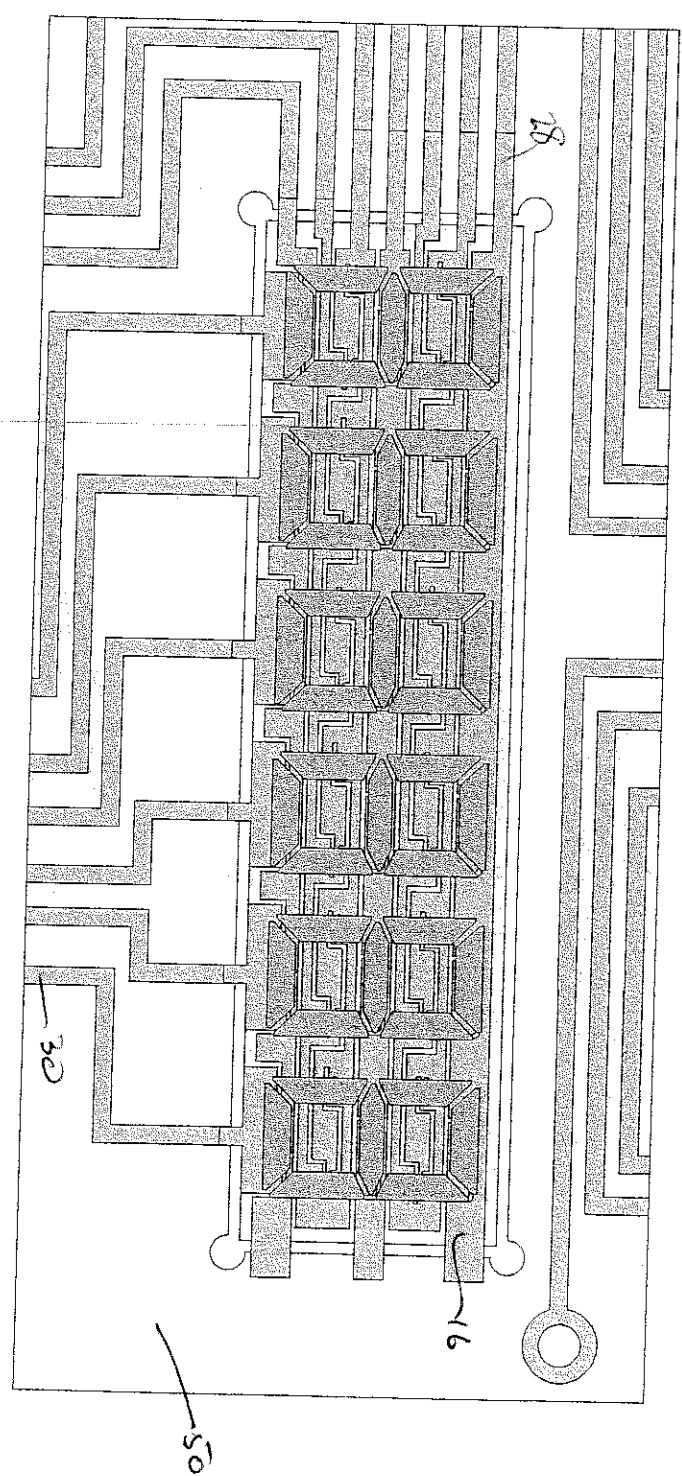
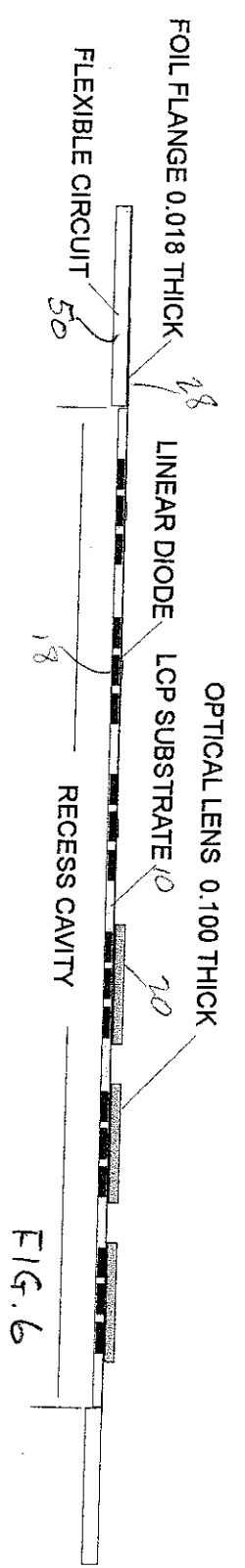


FIG. 7