

(12) **United States Patent**  
**Baretz et al.**

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 (45) **Date of Patent:** **\*Jul. 29, 2003**

- (54) **SOLID STATE WHITE LIGHT EMITTER AND DISPLAY USING SAME**
- (75) Inventors: **Bruce Baretz**, West Milford, NJ (US);  
**Michael A. Tischler**, Danbury, CT (US)
- (73) Assignee: **Advanced Technology Materials, Inc.**,  
 Danbury, CT (US)

(\* ) Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1212 days.

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- (51) **Int. Cl.<sup>7</sup>** ..... **H01L 33/00**
- (52) **U.S. Cl.** ..... **257/100; 257/88; 257/98; 257/99**
- (58) **Field of Search** ..... **257/88, 98, 99, 257/100**

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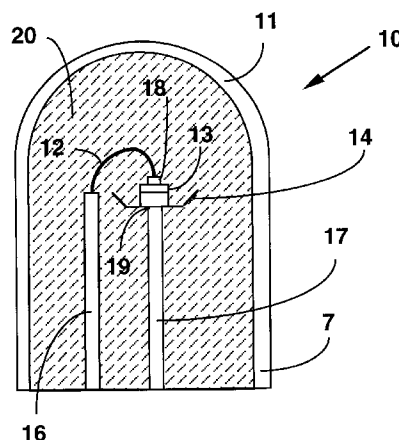
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*Primary Examiner*—Jerome Jackson  
 (74) *Attorney, Agent, or Firm*—Steven J. Hultquist; Margaret Chappuis

(57) **ABSTRACT**

A light emitting assembly comprising a solid state device coupleable with a power supply constructed and arranged to power the solid state device to emit from the solid state device a first, relatively shorter wavelength radiation, and a down-converting luminophoric medium arranged in receiving relationship to said first, relatively shorter wavelength radiation, and which in exposure to said first, relatively shorter wavelength radiation, is excited to responsively emit second, relatively longer wavelength radiation. In a specific embodiment, monochromatic blue or UV light output from a light-emitting diode is down-converted to white light by packaging the diode with fluorescent organic and/or inorganic fluorescers and phosphors in a polymeric matrix.

**26 Claims, 3 Drawing Sheets**



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FIGURE 1

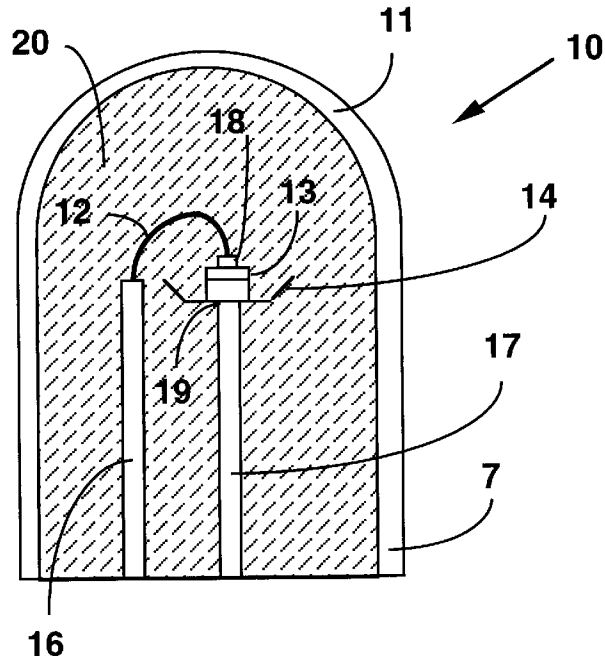


FIGURE 2

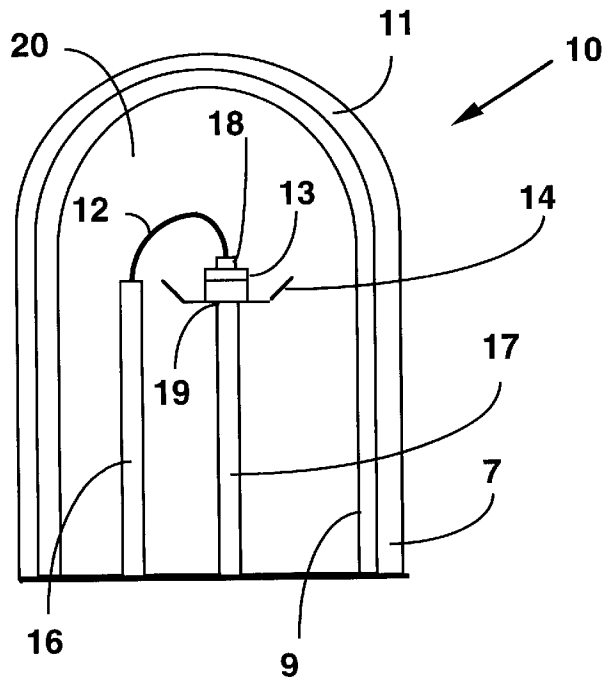


FIGURE 3

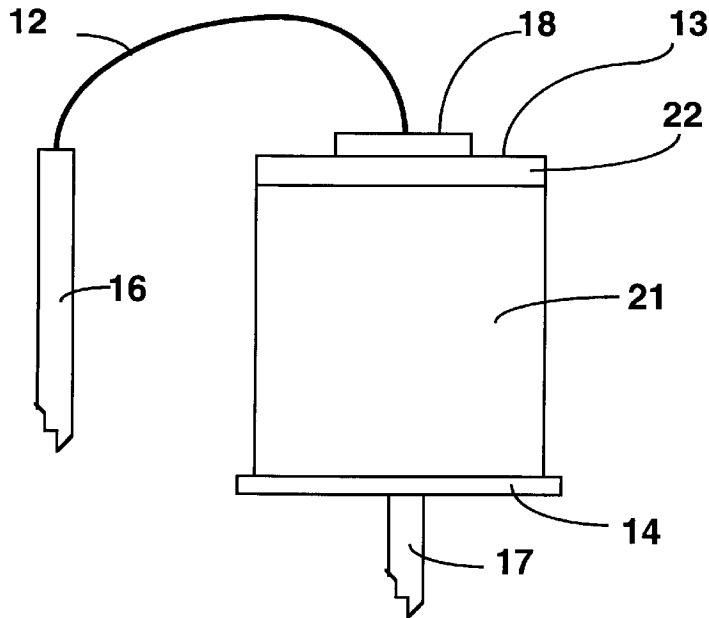


FIGURE 4

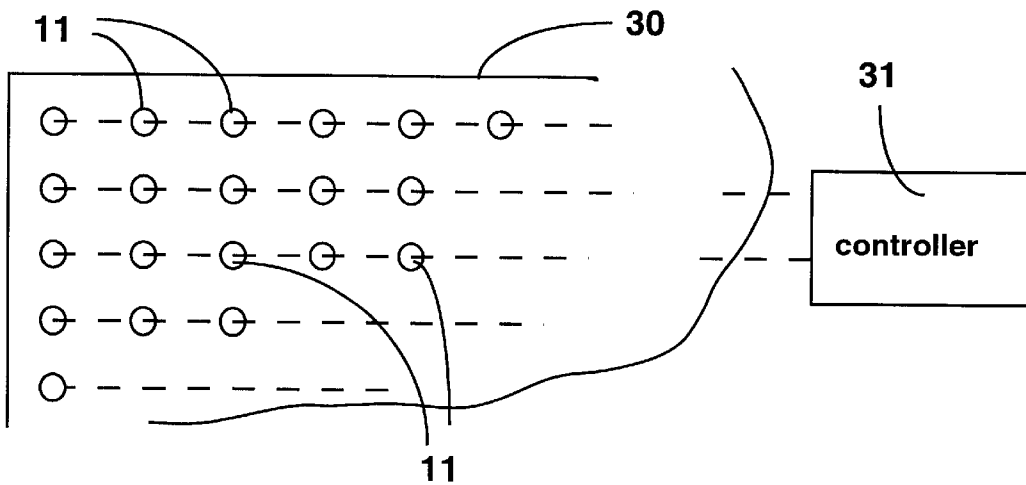


FIGURE 5

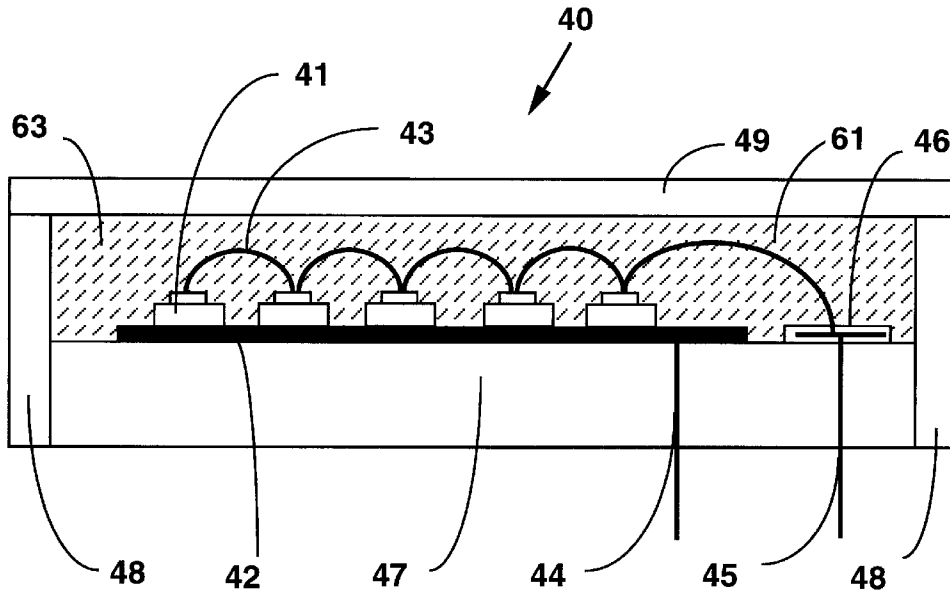
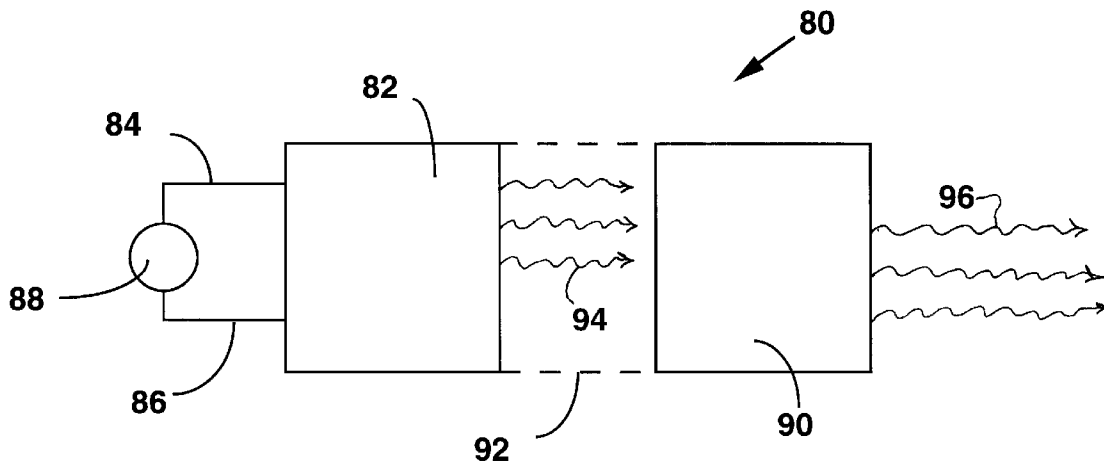


FIGURE 6



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