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**Roberge et al.**

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(54) **LED-BASED FIXTURES AND RELATED METHODS FOR THERMAL MANAGEMENT**

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(51) **Int. Cl.**  
**F21V 29/00** (2006.01)

(52) **U.S. Cl.** ..... **362/294; 362/218; 362/373; 362/147**

(58) **Field of Classification Search** ..... 362/147, 362/294, 373, 218  
See application file for complete search history.

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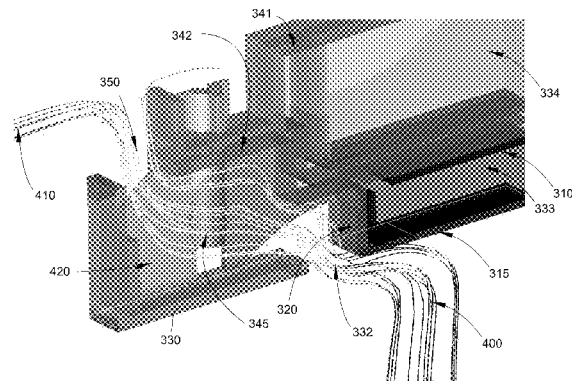
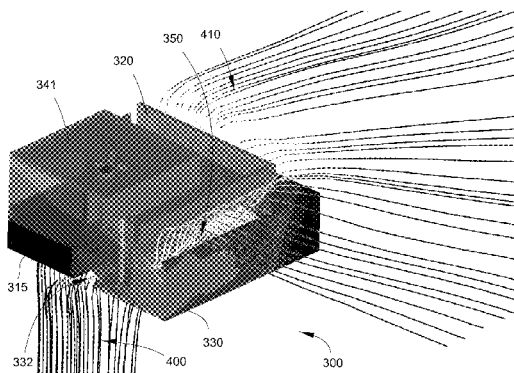
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*Primary Examiner*—Ali Alavi

(57) **ABSTRACT**

LED-based lighting fixtures suitable for general illumination in surface-mount or suspended installations, in which heat dissipation properties of the fixtures are significantly improved by decreasing thermal resistance between LED junctions and the ambient air. In various examples, improved heat dissipation is accomplished by increasing a surface area of one or more heat-dissipating elements proximate a trajectory of air flow through the fixture. In one aspect, various structural components of the fixtures are particularly configured to create and maintain a “chimney effect” within the fixture, resulting in a high air-flow rate, natural convection cooling system capable of efficiently dissipating the waste heat from the fixture without active cooling.

**23 Claims, 14 Drawing Sheets**



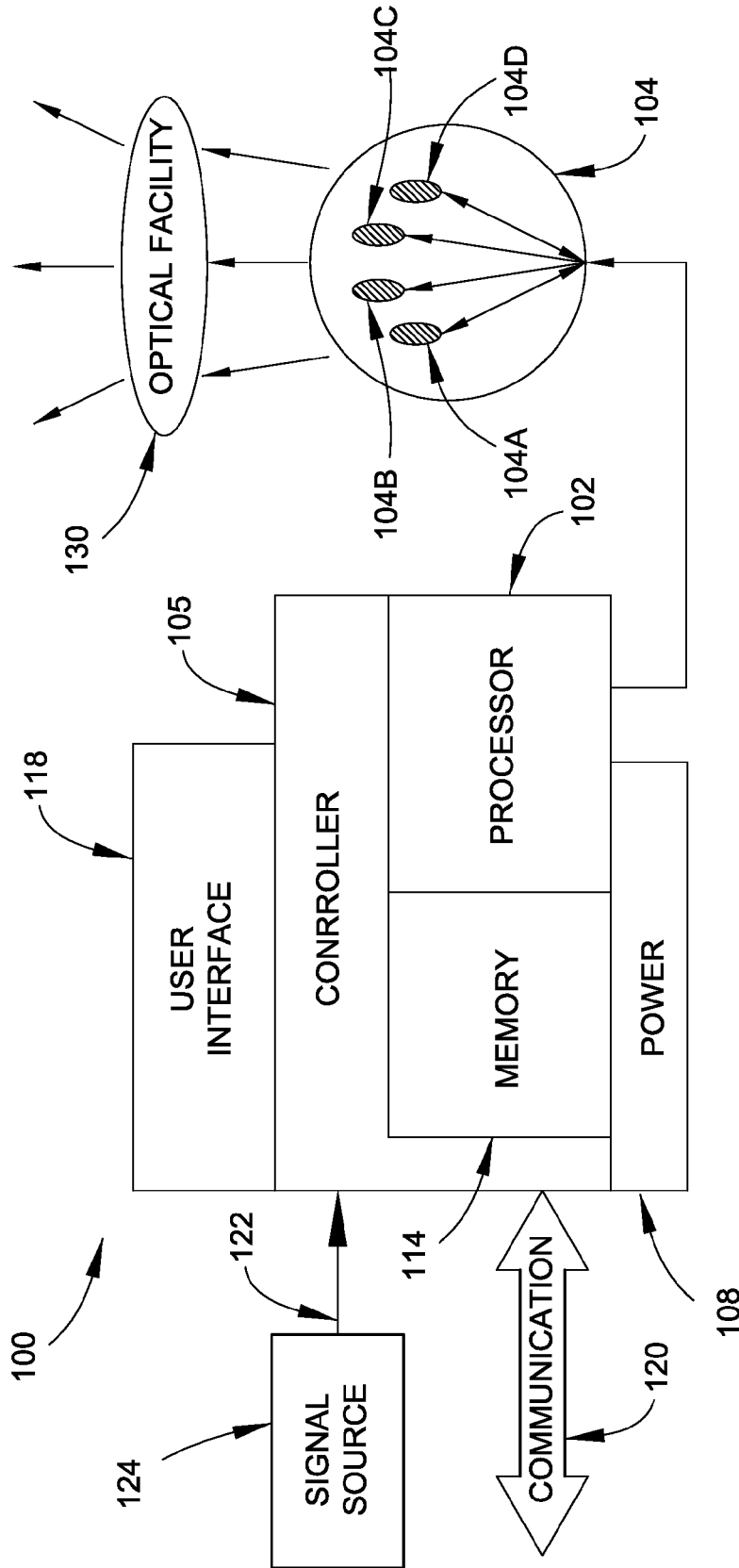


FIG. 1

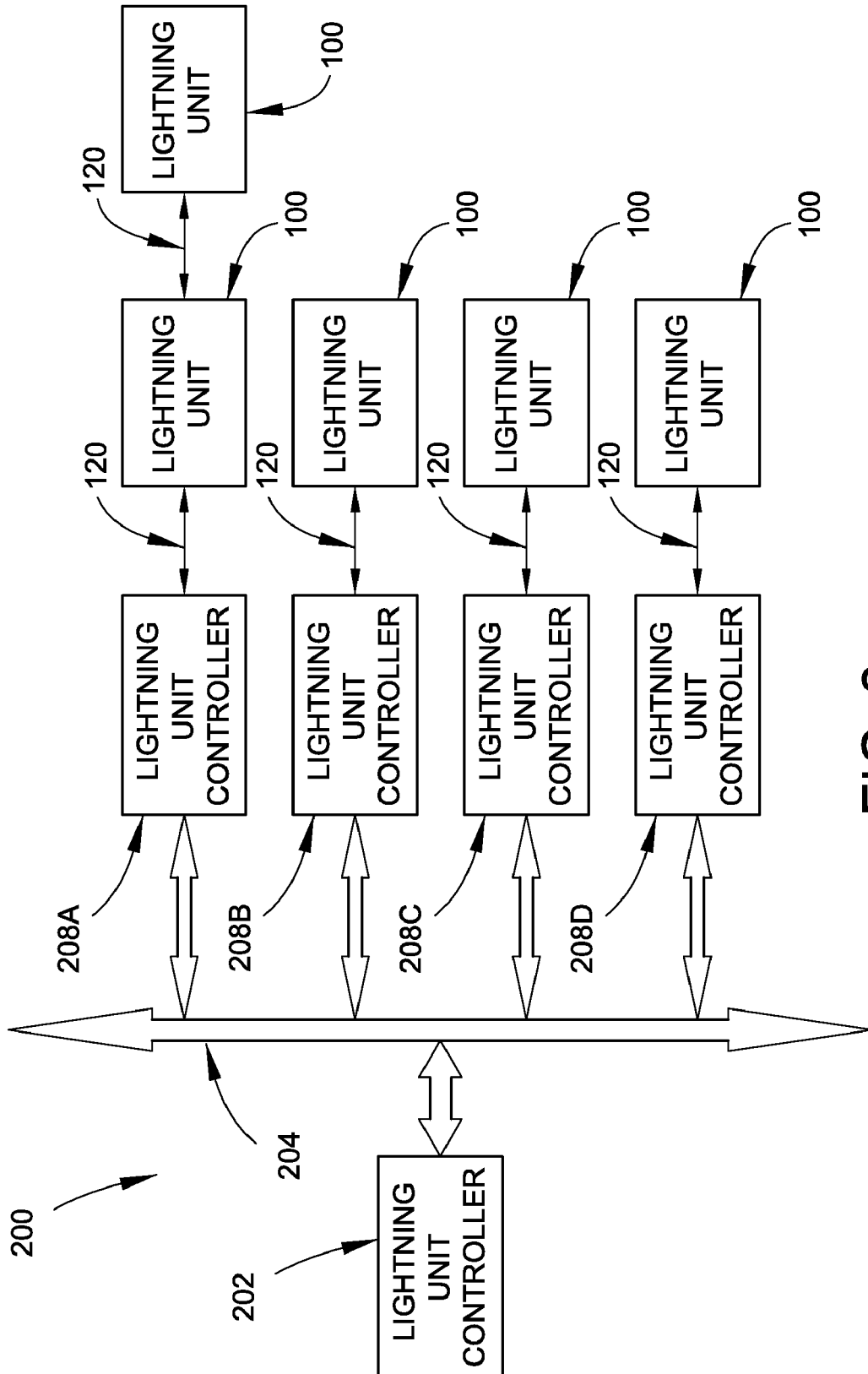


FIG. 2

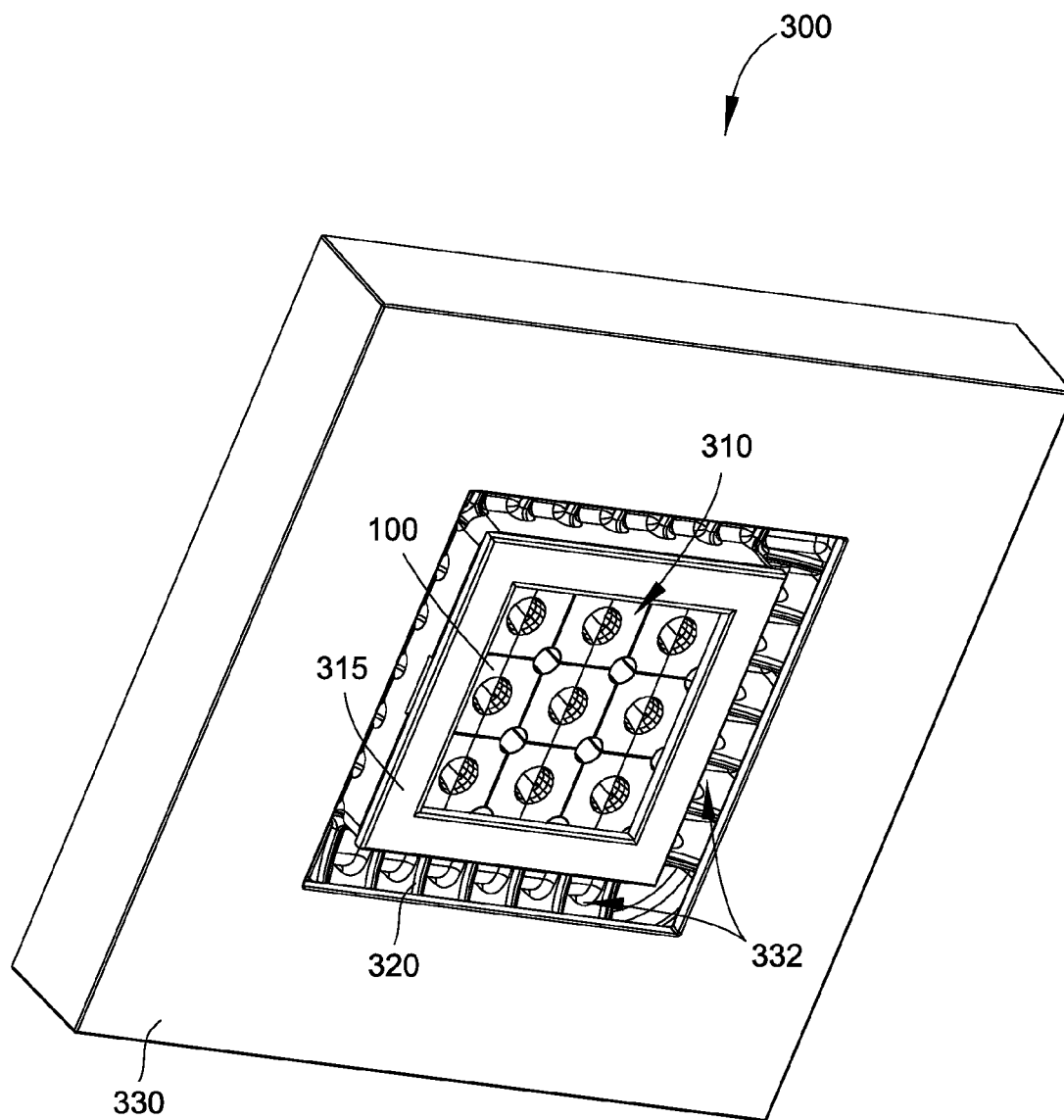


FIG. 3A

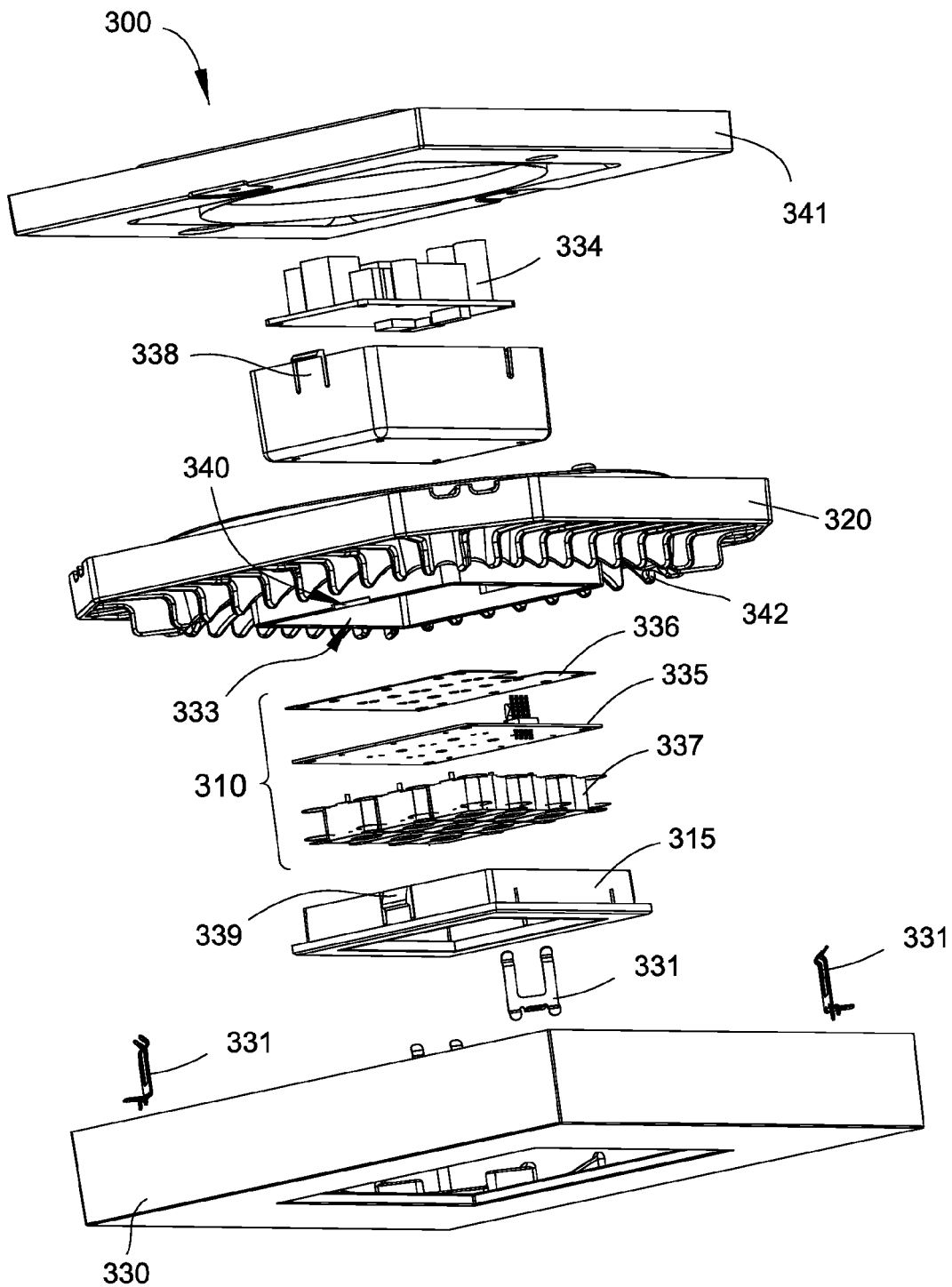


FIG. 3B

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