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United States Patent [19]

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Lengyel et al.

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[54] **HIGH EFFICIENCY BACKLIGHTING SYSTEM FOR REAR ILLUMINATION OF ELECTRONIC DISPLAY DEVICES**

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[73] Assignee: **Litton Systems, Inc.**, Woodland Hills

Akio, et al., "Discharge Lamp Lightup Device", Matsushita Electric Works, Ltd., Apr. 6, 1990, pp. 1-9.

[21] Appl. No.: **08/967,442**

Imamura, Hiroshi, "Rapid Start Type Fluorescent Lamp", Matsushita Electric Works, Ltd., Jul. 16, 1980, pp. 1-4.

[22] Filed: **Nov. 11, 1997**

Hiroyasu, Eriguchi, "Luminous Radiation Electron Tube Lighting Device", Matsushita Electric Works, Ltd., Dec. 8, 1992, pp. 1-7.

Related U.S. Application Data

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[63] Continuation of application No. 08/632,752, Apr. 16, 1996, abandoned, which is a continuation of application No. 08/150,355, Nov. 3, 1993, abandoned.

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[51] **Int. Cl.⁶** **H05B 41/16**

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[52] **U.S. Cl.** **315/158; 315/309; 315/97; 345/102; 313/493; 313/573; 313/576**

J. Michael Lengyel, "Woe is the Backlight", presented at Aerospace Lighting Institute, Feb. 1992.

[58] **Field of Search** 315/105, 309, 315/158, 49, 57, 94, 97, 115, 151; 362/84; 313/493, 549, 573, 576; 345/102

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Attorney, Agent, or Firm—Price Gess & Ubell

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[57] ABSTRACT

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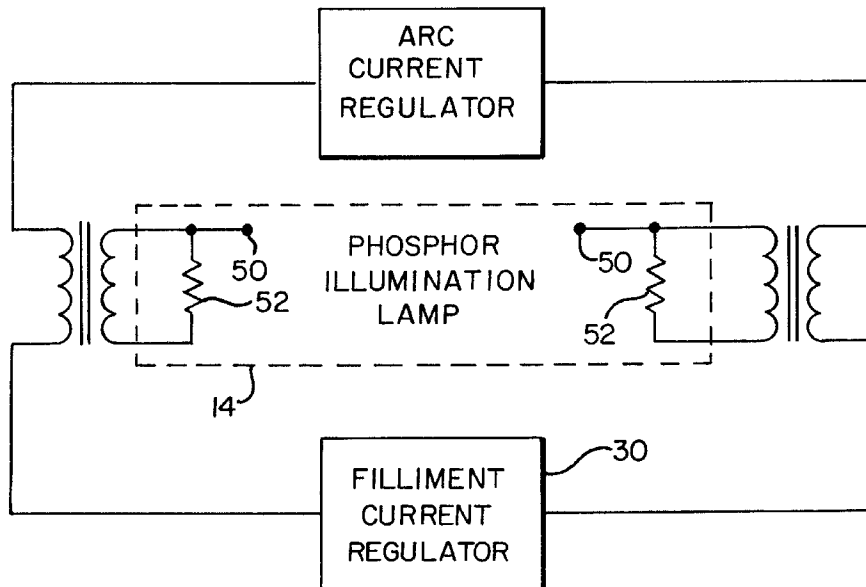
A fluorescent cavity backlight system that provides a high efficiency light source suitable for rear illumination of transmissive electronic display devices. The inventive fluorescent cavity backlight system can be adapted to a wide variety of flat panel display applications. The invention takes a complete system approach towards designing a high efficiency backlight source. The backlight system comprises three major subassemblies: a phosphor illuminator, a fluorescent cavity, and improved control/driver electronics. Each of the subassemblies has been optimized internally, and with respect to each of the other subassemblies.

(List continued on next page.)

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17 Claims, 5 Drawing Sheets



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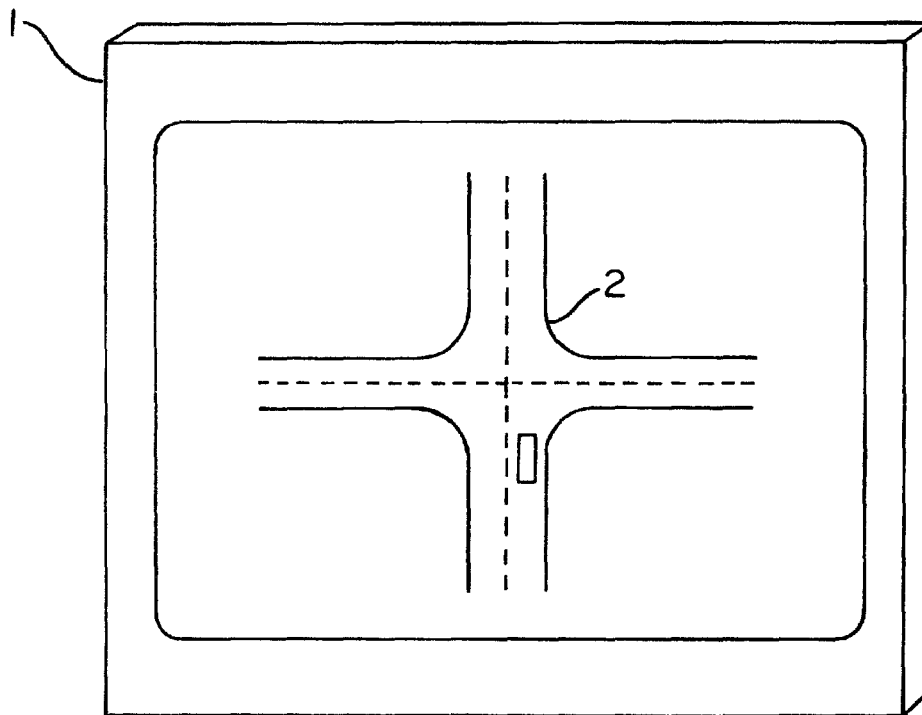


FIG. 1
PRIOR ART

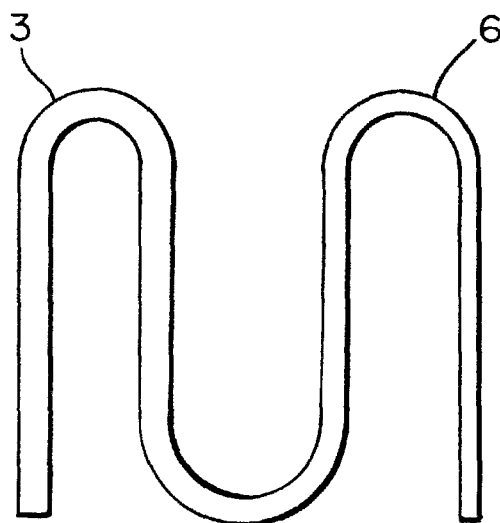


FIG. 2
PRIOR ART

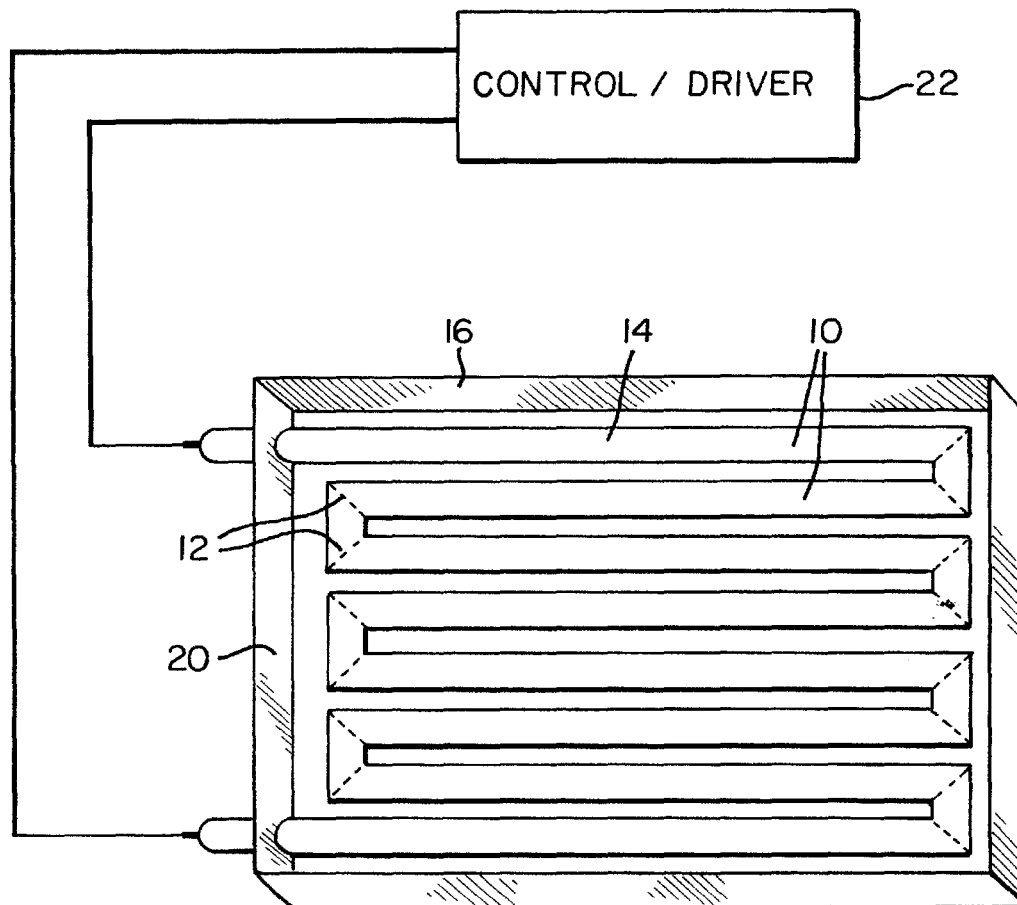


FIG. 3A

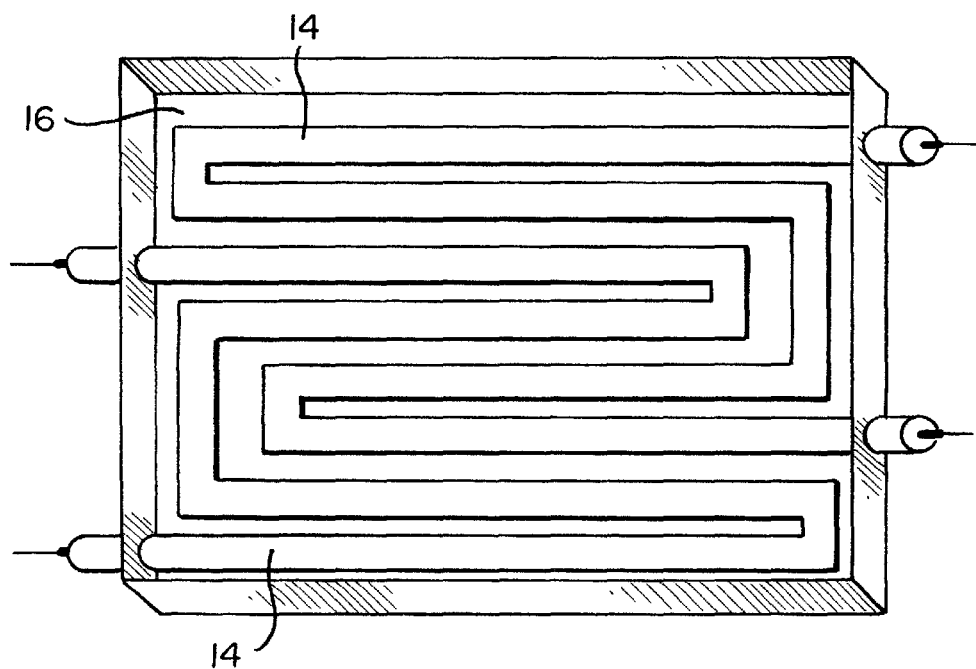


FIG. 3B

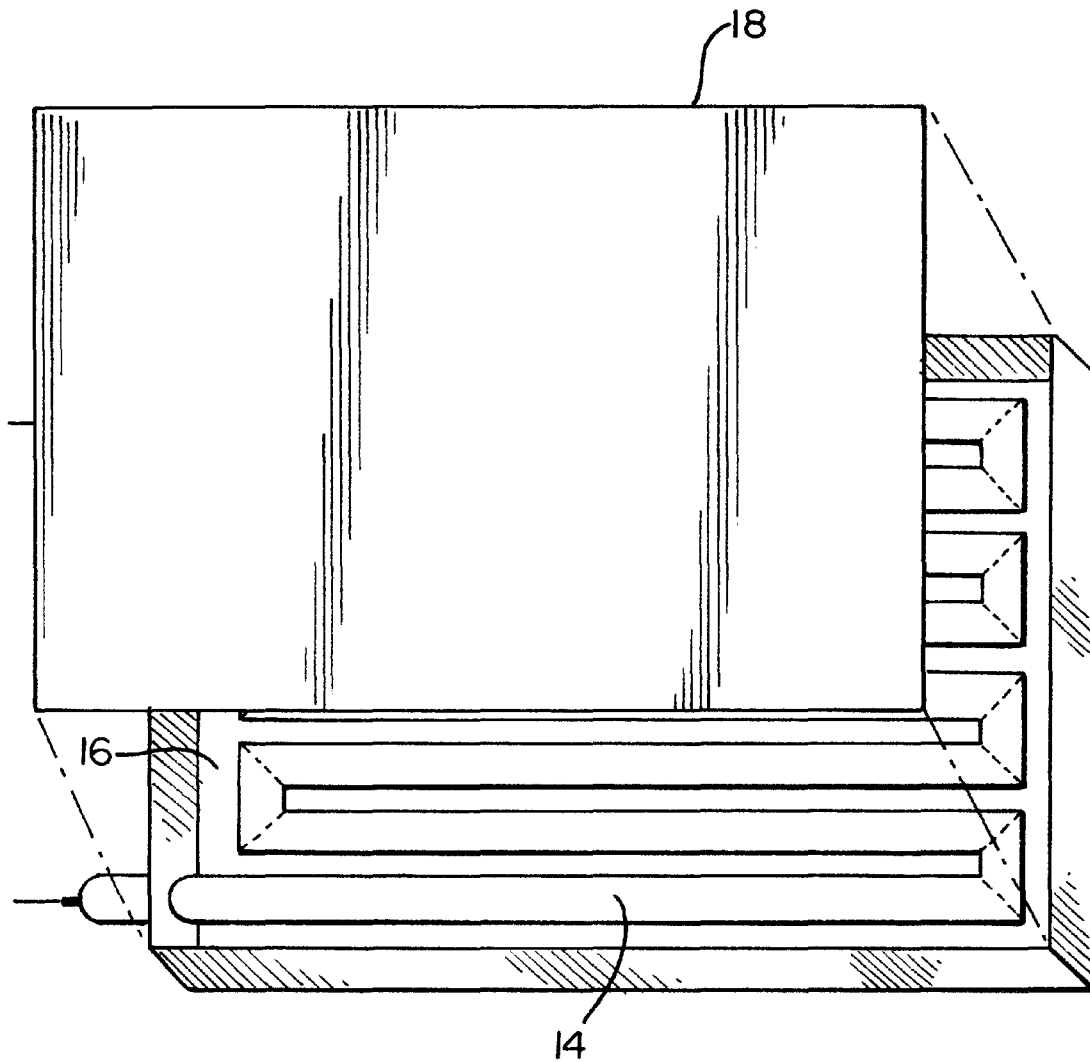


FIG. 4

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