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United States Patent [19]
Heady et al.

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[54] **HEAT TRANSFER SYSTEM AND METHOD FOR ELECTRONIC DISPLAYS**

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[73] Assignee: **Lacerta Enterprises, Inc.**, Phoenix, Ariz.

[21] Appl. No.: **09/183,165**

[22] Filed: **Oct. 30, 1998**

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Related U.S. Application Data

[63] Continuation-in-part of application No. 08/960,525, Oct. 31, 1997.

[51] **Int. Cl.**⁶ **H05K 7/20**

[52] **U.S. Cl.** **361/704; 361/687; 361/695; 165/102.32; 165/185; 349/12**

[58] **Field of Search** 361/682, 687, 361/692-698, 724, 683, 735; 165/104.14, 104.33, 104.34, 80.2, 80.3, 80.4, 104.32, 165, 185; 313/17, 22, 35, 44; 345/10, 87; 349/12, 58, 161

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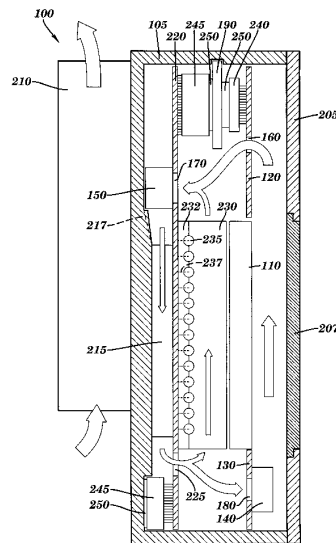
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Assistant Examiner—Michael Datskovsky
Attorney, Agent, or Firm—Schmeiser, Olsen & Watts

[57] **ABSTRACT**

An electronic display unit includes: 1) a sealed display housing; 2) an electronic display inside the display housing; 3) circuit boards inside the display housing; 4) a heat collector inside the display housing; 5) a heat dissipater outside the display housing; and 6) a thermally conductive link between the heat collector and the heat dissipater. Various apparatus and methods allow gathering heat inside the display housing and transferring heat either to outside the display housing or to the electronic display inside the display housing. The transfer occurs without exposing electronic components inside the display housing to dust and moisture. Thus, exposure of the electronic components to excessive heat is avoided and exposure of the electronic display to excessive cold is also avoided. The electronic display, along with the circuit board, are positioned to at least partially define a front chamber, a center chamber, and a rear chamber. Also, a front and rear fan set are positioned to circulate air among the chambers to accomplish the indicated effects.

20 Claims, 6 Drawing Sheets



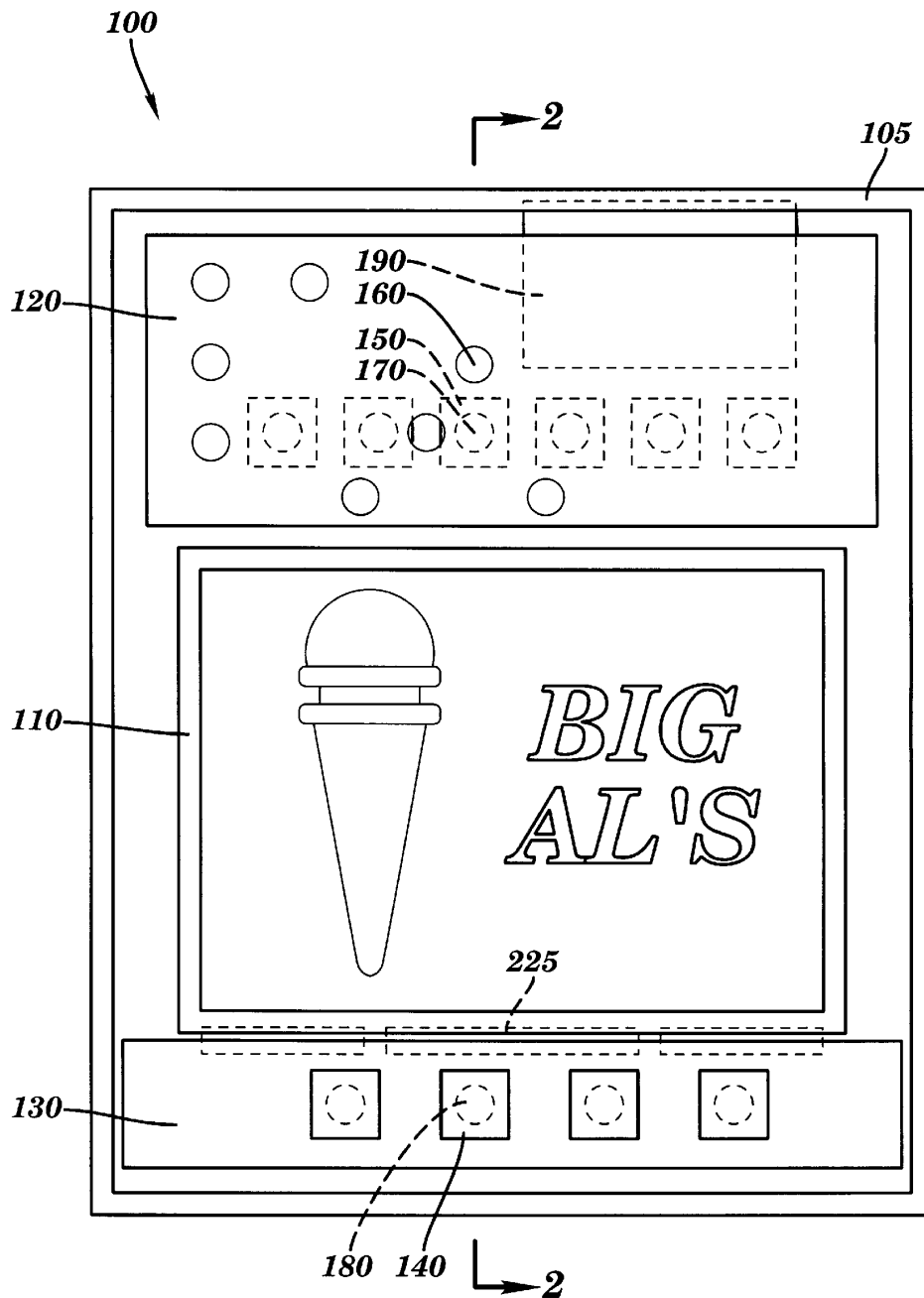


FIG. 1

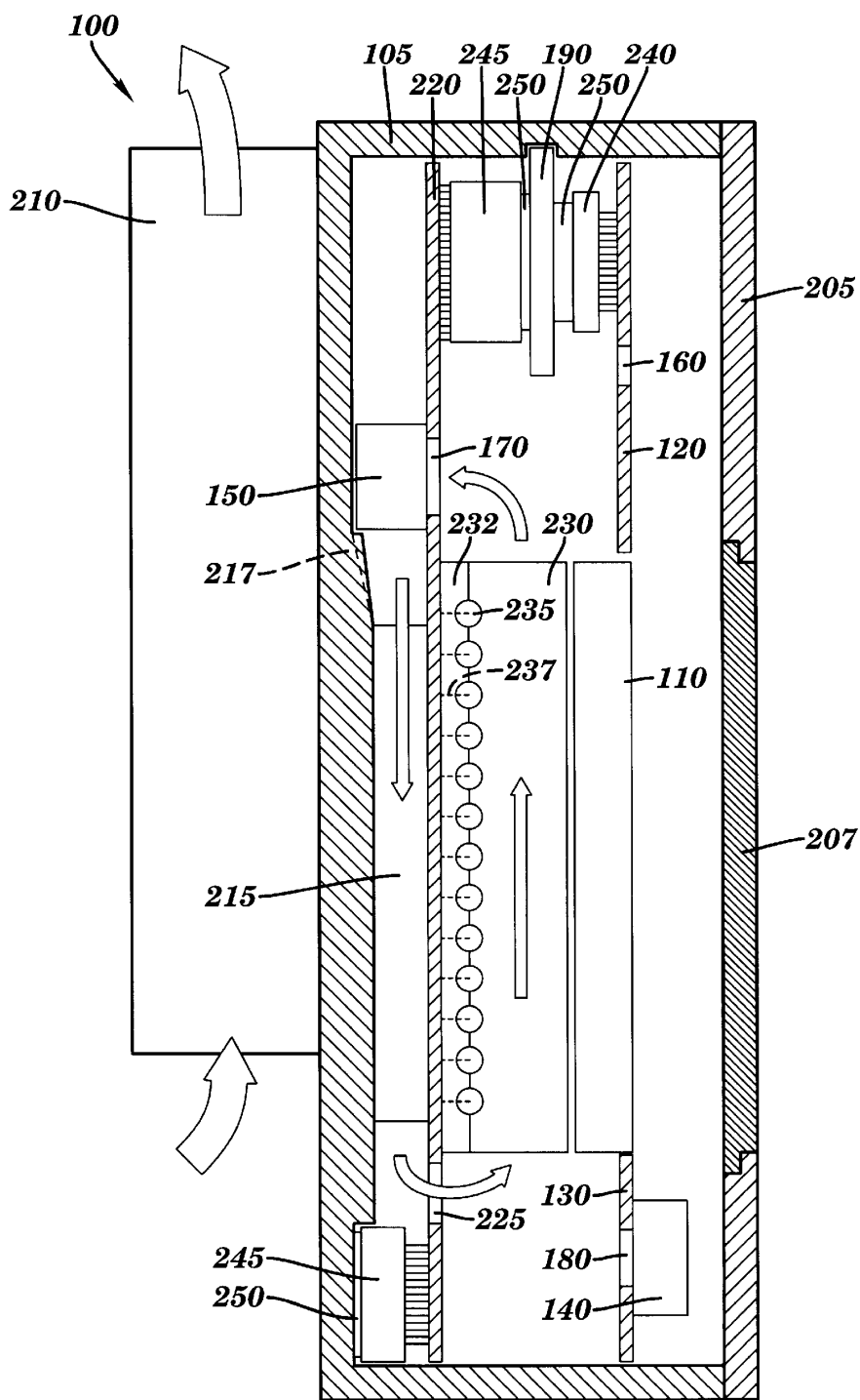


FIG. 2

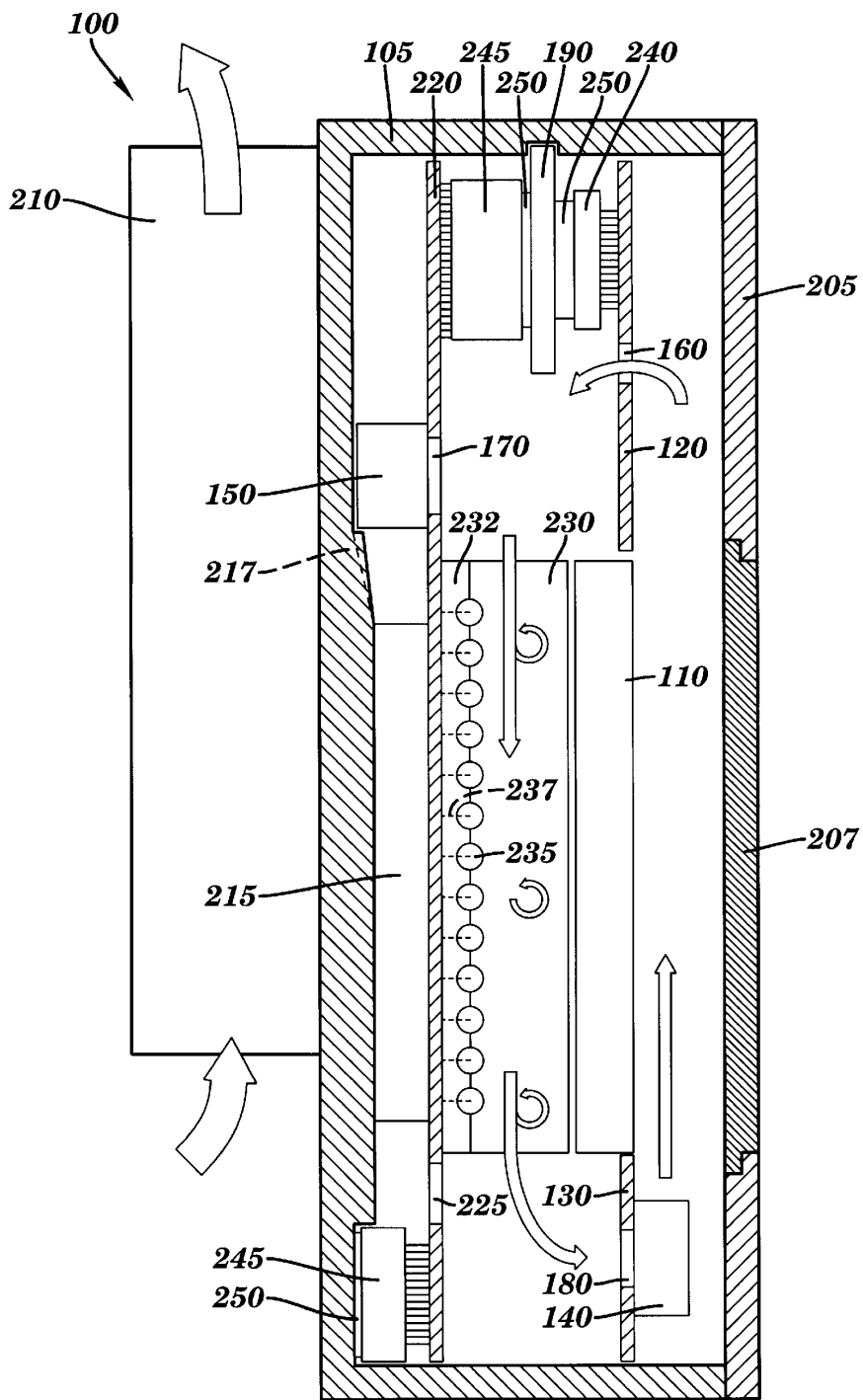


FIG. 3

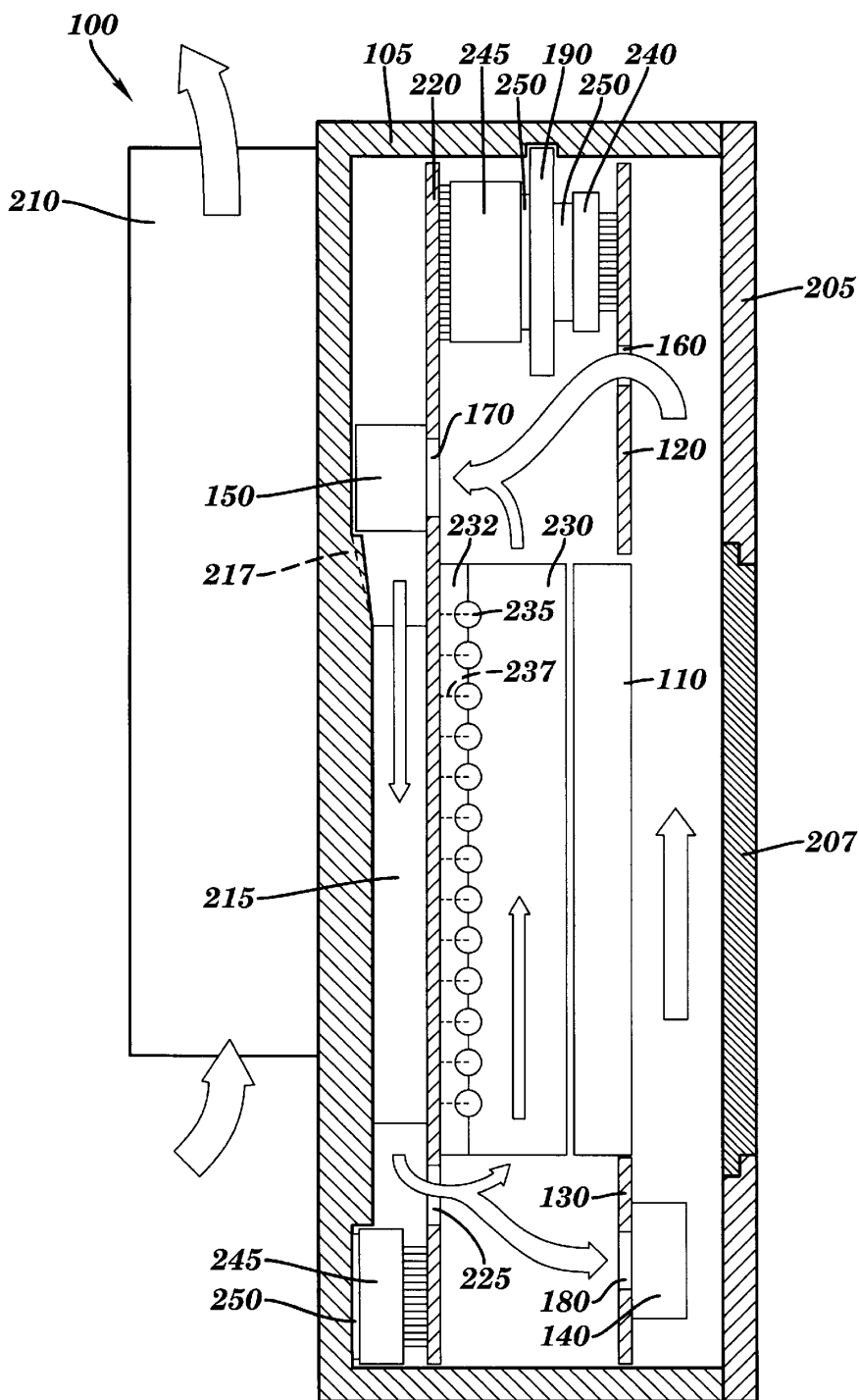


FIG. 4

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