



[54] **HEAT EXCHANGE APPARATUS**
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[52] **U.S. Cl.** **165/80.3**; 165/80.4; 165/80.5; 165/104.33; 257/714; 317/234 R
[58] **Field of Search** 165/80.3, 80.4, 165/80.5, 104.33; 257/714; 317/234 R

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Primary Examiner—Ira S. Lazarus
Assistant Examiner—Terrell McKinnon

[57] **ABSTRACT**

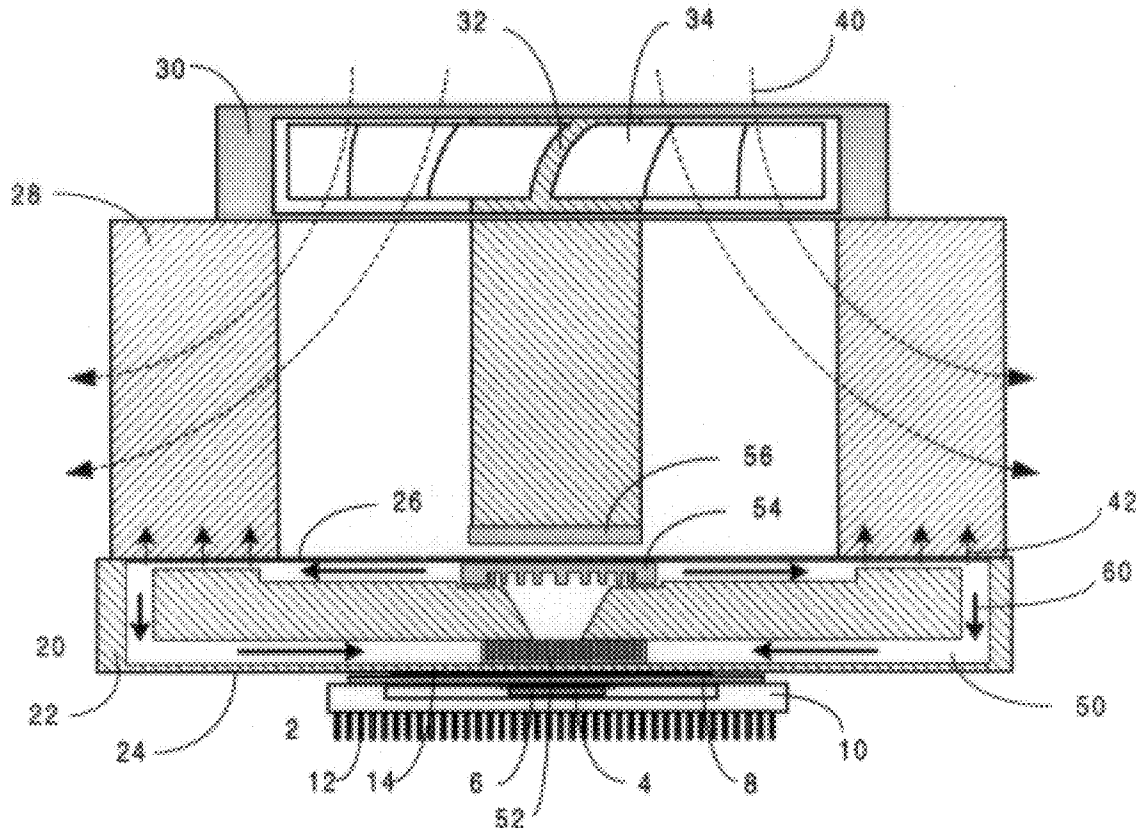
An apparatus to transfer heat from a heat source to a heat absorber, the apparatus consisting of an active thermal spreader plate with internal flow channels, a recirculating heat transfer fluid, and a means to impel the heat transfer fluid using an external moving magnetic field. In the most preferred embodiment a centripetal pump impeller is trapped inside the active thermal spreader plate, and the impeller is motivated to rotate due to eddy currents generated by the external moving magnetic fields.

35 Claims, 13 Drawing Sheets

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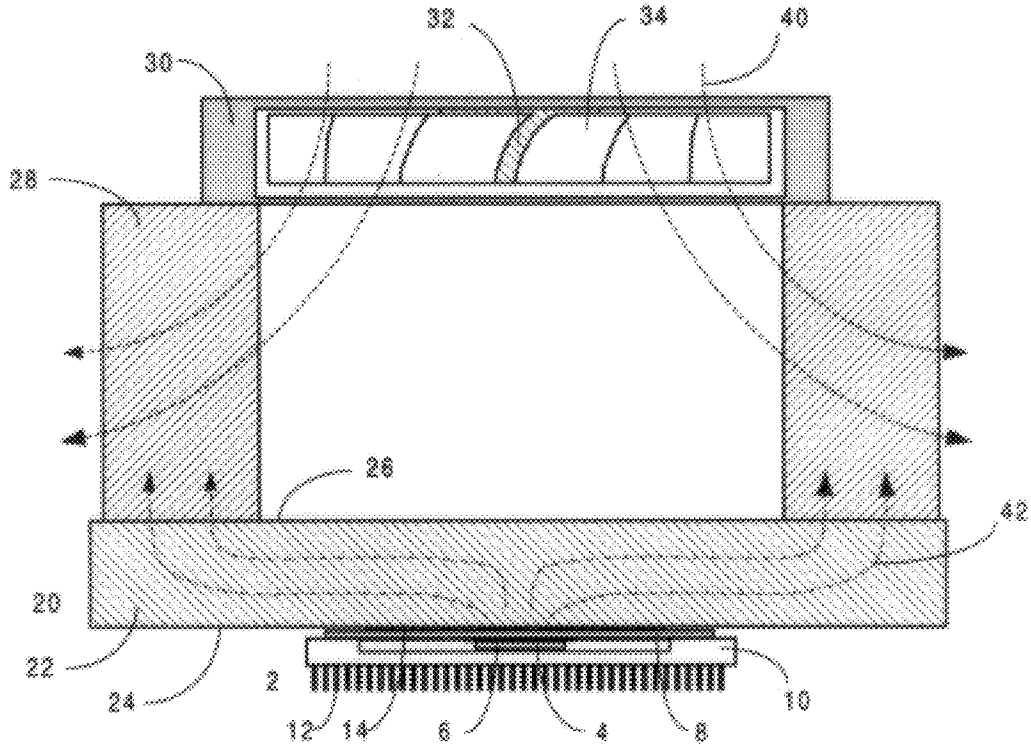


FIG.1 Prior Art

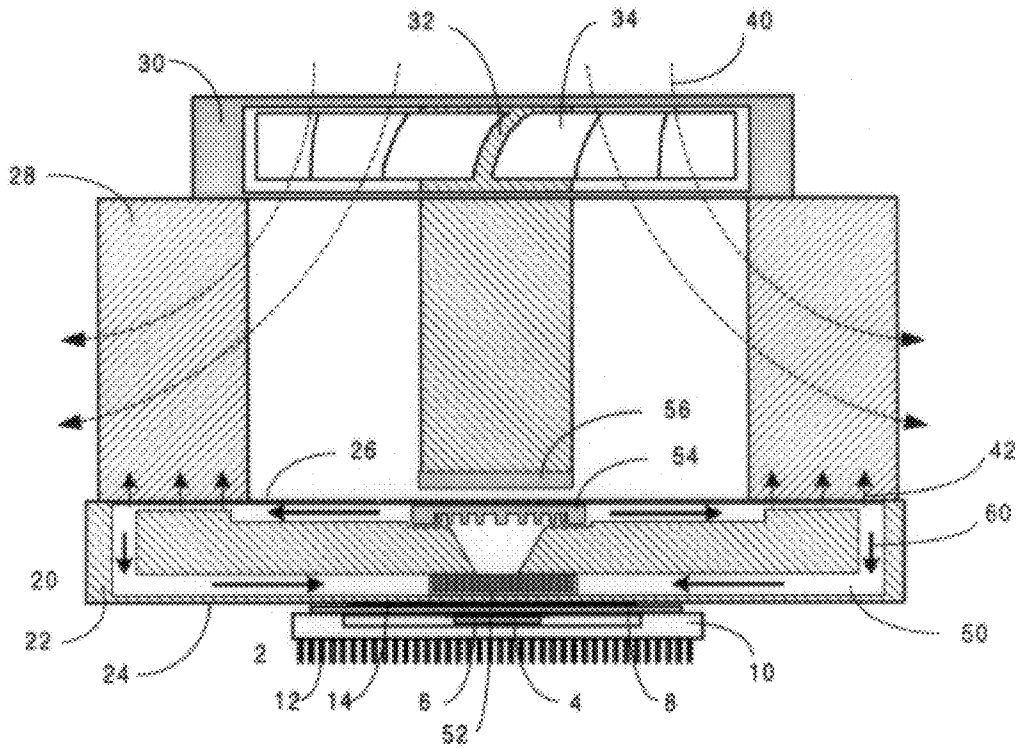


FIG. 2

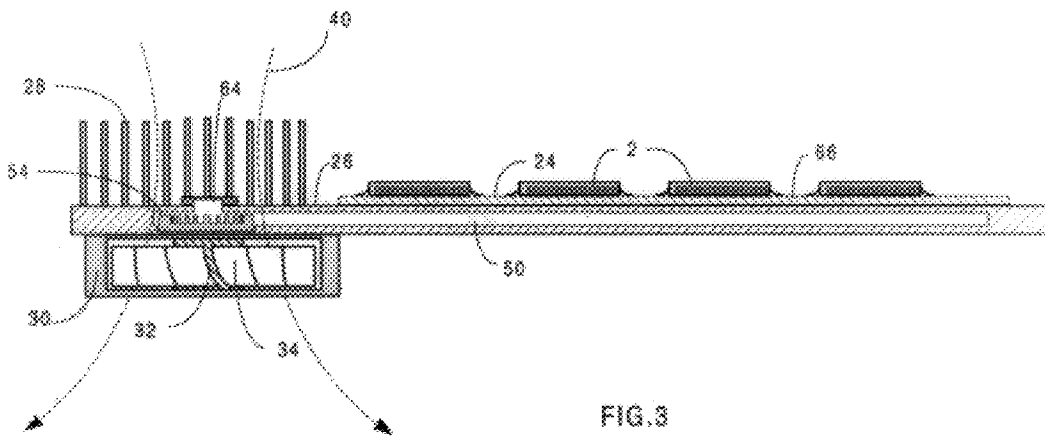
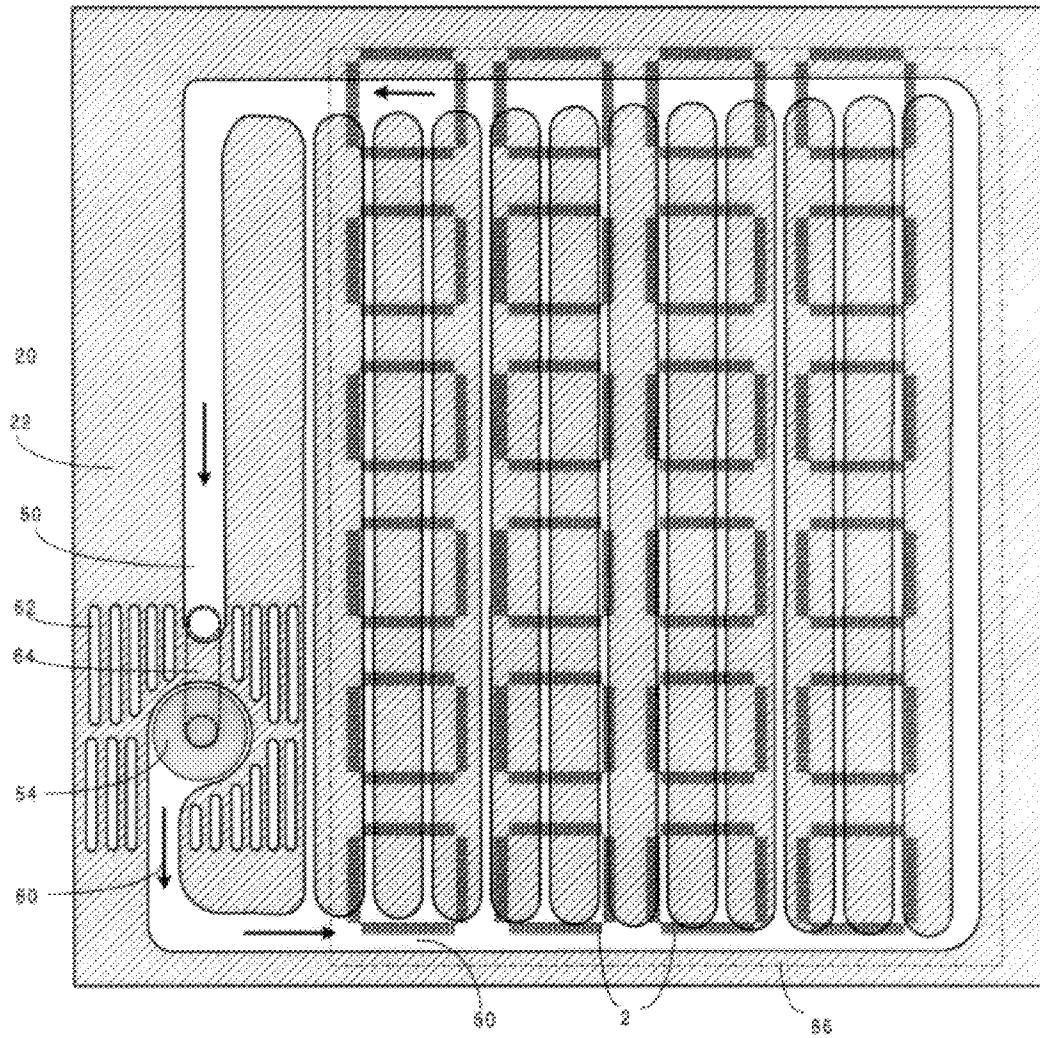


FIG. 3

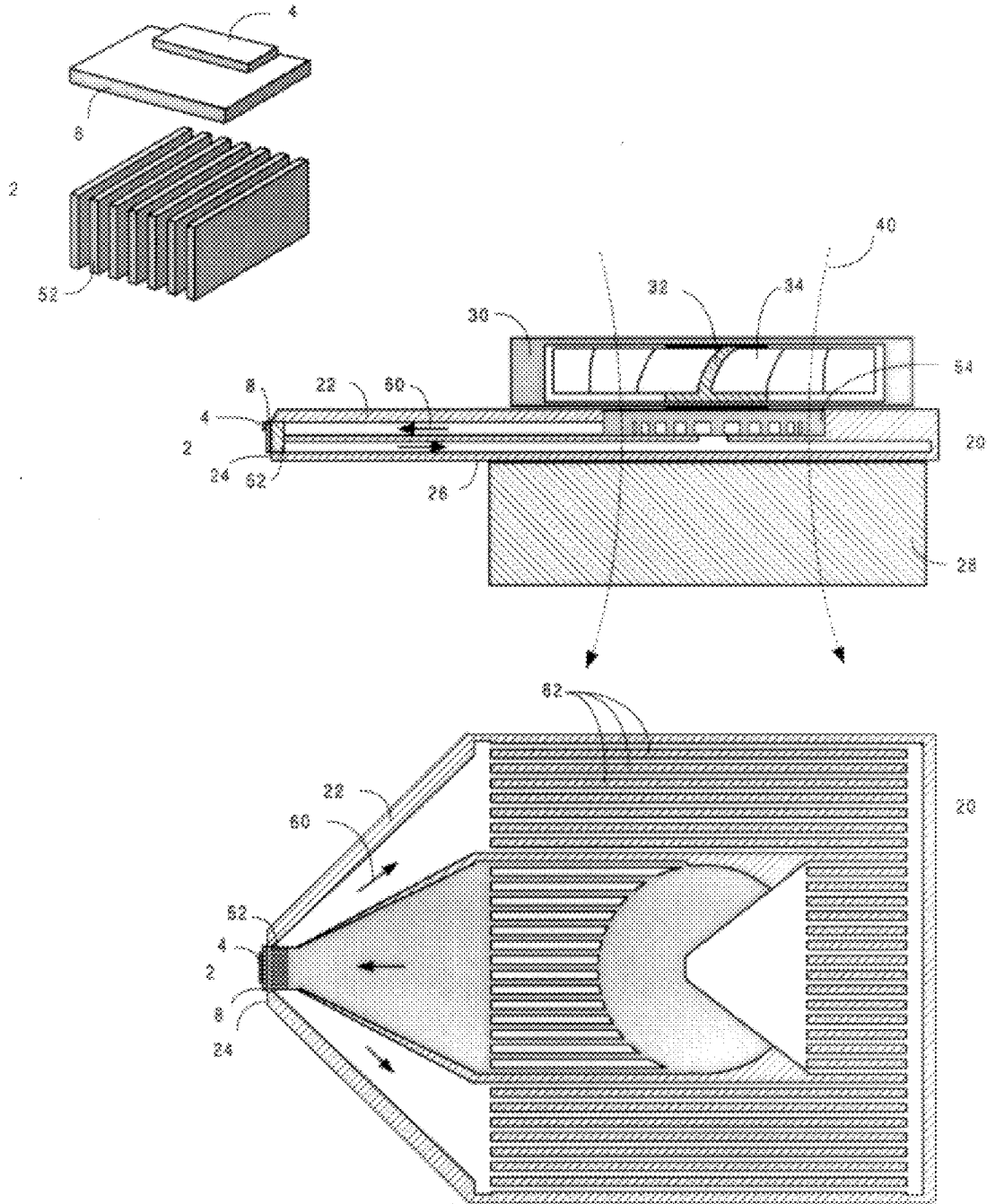


FIG. 4

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