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[54] **MICROCOMPONENT SHEET ARCHITECTURE**

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[58] Field of Search 165/185; 361/700; 62/498, 115, 51, 1 R

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,386,505 6/1983 Little 165/185 X
4,392,362 7/1983 Little 165/185 X

OTHER PUBLICATIONS

High Flux Boiling in Low Rate, Low Pressure Drop Mini-Channel Heat Sinks Bowers et al Mar. 11, 1993, Purdue University.

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[57] **ABSTRACT**

The invention is a microcomponent sheet architecture wherein macroscale unit processes are performed by microscale components. The sheet architecture may be a single laminate with a plurality of separate microcomponent sections or the sheet architecture may be a plurality of laminates with one or more microcomponent sections on each laminate. Each microcomponent or plurality of like microcomponents perform at least one unit operation. A first laminate having a plurality of like first microcomponents is combined with at least a second laminate having a plurality of like second microcomponents thereby combining at least two unit operations to achieve a system operation.

15 Claims, 8 Drawing Sheets

