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Sayegh

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[54] **DIRECTIONAL HEAT EXCHANGER**

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[52] U.S. Cl. **165/41; 165/168; 165/47; 165/80.3; 165/80.4; 165/104.21; 165/104.33; 165/104.25; 114/340**

[58] Field of Search 165/41, 44, 168, 165/170, 166, 185, 80.3, 104.21, 169, 47, 80.4, 104.33, 104.25; 114/340

[57] ABSTRACT

A directional heat exchanger system dissipates heat generated by components contained within a thermally insulated antenna mounted atop a periscope tube. A first wall of thermally conductive material has a first face and a second face with the first face being shaped to substantially contact an internal portion of the periscope tube. A plurality of ribs made from thermally conductive material are fixedly coupled to the second face. A second wall of thermally conductive material opposes the second face of the first wall and is in tangential contact with the ribs to form a fluid seal therewith. At least one channel is formed between the first and second walls. The end of each rib is offset from the end of adjacent ribs such that the channel defines a flow path having a first end and a second end. The components generating heat are thermally coupled to a heat pipe positioned partially in the antenna and partially in the periscope tube. A liquid coolant delivery system is coupled to the first and second ends of the flow path to pump a liquid coolant into the first end and recapture the liquid coolant exiting the second end.

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7 Claims, 2 Drawing Sheets

