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(54) **ENVIRONMENTAL CONTROL SYSTEM FLUID SENSING SYSTEM AND METHOD**

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See application file for complete search history.

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(57) **ABSTRACT**

A system for monitoring a fluid in an environmental control system includes a mechanical resonator positioned for contacting a thermal change fluid. In some embodiments, the mechanical resonator is positioned in a passage for containing the thermal change fluid. Suitable thermal change fluids include an R-134A refrigerant, a mineral oil, an ester lubricant or a mixture thereof; a superheated refrigerant; or an elevated pressure and elevated temperature vapor, an elevated pressure liquid, a reduced pressure liquid, a reduced pressure vapor and combinations thereof. The mechanical resonator can be a flexural resonator or a torsion resonator. In some embodiments, the mechanical resonator is a tuning fork resonator. Methods of the invention include monitoring a response of the mechanical resonator to the thermal change fluid. In some embodiments, at least a portion of the mechanical resonator is translated through the thermal change fluid and the response of the resonator to the fluid is monitored.

43 Claims, 7 Drawing Sheets