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(54) **MICROSENSOR FOR MERCURY**
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See application file for complete search history.

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(57) **ABSTRACT**
Methods and devices for detecting a concentration of one or more element in hydrocarbon and/or natural gas in an oil and gas field application. The device including a microstructure having a low thermal mass suspended within a channel, the microstructure includes a supporting layer and a insulating layer; a controllable thermal device in communication with the supporting layer of the microstructure, wherein the controllable thermal device is controllably heated to one or more release temperature of the one or more element; a sensing layer arranged on the insulating layer to absorb molecules of the one or more element from hydrocarbon and/or natural gas; a detecting and measuring resistance device in communication with the sensing layer for measuring the resistance changes caused by absorption of molecules of the one or more element onto the sensing layer at a first temperature and a second temperature, and storing the data on a processor.

14 Claims, 9 Drawing Sheets

