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**Knopp et al.**

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(54) **MOLECULAR READER**

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See application file for complete search history.

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(57) **ABSTRACT**

Systems and methods disclosed include: a support apparatus configured to detachably receive a chip; movable pins extendible from a first position to a second position, where, in the first position, the movable pins do not contact a chip positioned on the support apparatus, and in the second position, the movable pins contact electrical terminals of a heating element within a chip positioned on the support apparatus; a radiation source configured to direct radiation to be incident on a chip positioned on the support apparatus; a detector; and an electronic processor, the electronic processor being configured to detect molecules in a sample positioned within the chip, and to determine a temperature of the chip by measuring an electrical resistance between two of the multiple pins connected to the electrical terminals.

**34 Claims, 11 Drawing Sheets**

