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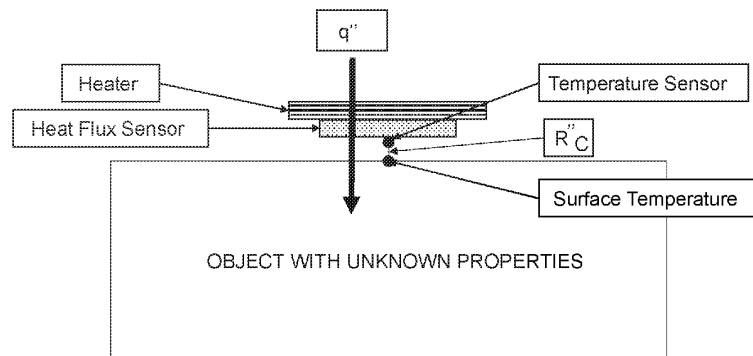


FIG. 4

(57) Abstract: Various non-invasive sensors are adapted to be placed on a surface of an object having a volume with an internal region. The internal region of the object has internal properties indicated by corresponding internal parameters and an internal temperature distribution that is a function of the internal parameters and surface thermal signals. Each non-invasive sensor includes a heat flux sensor having one or more heat flux sensor output terminals to provide a measured heat transfer signal for the surface of the object, and a temperature sensor having one or more temperature sensor output terminals to provide a measured temperature signal for the surface of the object. Systems including one or more of the sensors perform non-invasive sensing of the object including accurate and rapid determination of an internal temperature distribution of the internal region of the object as well as one or more other internal properties of the object.

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