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[Continued on next page]

(54) Title: APPARATUS AND METHODOLOGY FOR MEASURING PROPERTIES OF MICROPOROUS MATERIAL AT MULTIPLE SCALES

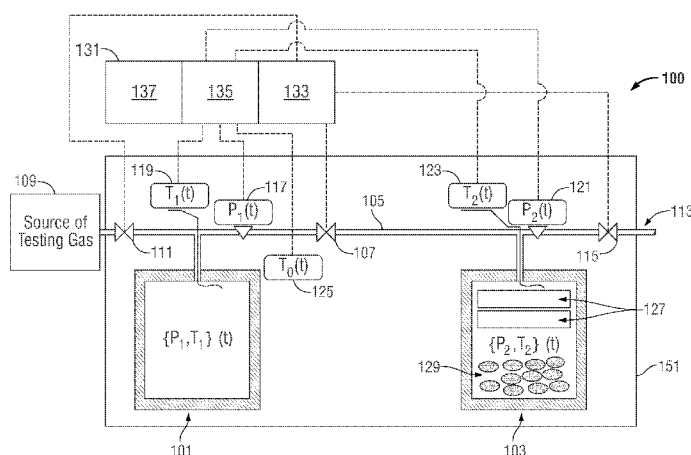


FIG. 2

(57) Abstract: A test apparatus (and method of operation) for characterizing properties of a sample under test (such as porous material, for example, samples of reservoir rock) that operates in conjunction with a source of test fluid. The test apparatus includes an intake valve fluidly coupled to the source of test fluid, a reference cell fluidly coupled to the source of test fluid via the intake valve, a sample cell that holds the sample under test, an isolation valve fluidly coupled between the reference cell and the sample cell, an exhaust port, an exhaust valve fluidly coupled between the sample cell and the exhaust port, a first pressure sensor associated with the reference cell for measuring pressure within the reference cell, and a second pressure sensor associated with the sample cell for measuring pressure within the sample cell. The method of operation includes calibration procedures to compensate for systematic measurement errors.

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**A. CLASSIFICATION OF SUBJECT MATTER****G01N 15/00(2006.01)i, G01N 7/10(2006.01)i, G01N 1/28(2006.01)i, G01N 33/24(2006.01)i**

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**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

G01N 15/00; G01N 7/10; G01L 7/00; G01V 3/00; G01N 15/08; G01N 1/28; G01N 33/24

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) &amp; Keywords:permeability, porosity, pressure, temperature, rock

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CUI et al., Measurements of gas permeability and diffusivity of tight reservoir rocks: different approaches and their applications, Geofluids, 2009, Vol. 9, Issue 3, pp. 208-223 See abstract; pages 208-219; and figures 1-5.	1-12
A		13-32
A	CIVAN et al., Determining shale permeability to gas by simultaneous analysis of various pressure tests, SPE Journal, 2012, Vol. 17, Issue 3, pp.717-726 See abstract and pages 718-723.	1-32
A	KR 10-1223462 B1 (KIGAM) 17 January 2013 See abstract; paragraphs [0008]-[0077]; claims 1-10; and figures 1-4.	1-32
A	US 7082812 B2 (LENORMAND et al.) 01 August 2006 See abstract; columns 2-10; claims 1-10; and figures 1-8.	1-32
A	US 7388373 B2 (LENORMAND et al.) 17 June 2008 See abstract; columns 4-7; and claims 1-3.	1-32

 Further documents are listed in the continuation of Box C. See patent family annex.

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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