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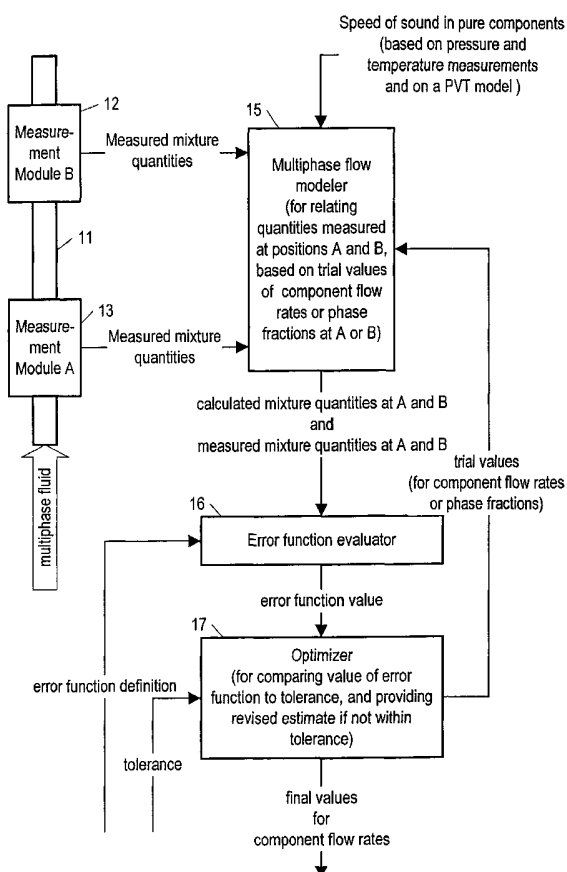
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[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR DETERMINING COMPONENT FLOW RATES FOR A MULTIPHASE FLOW



(57) Abstract: A method for determining component flow rates of a multiphase fluid in a conduit (the fluid consisting of at least three known components) includes the steps of: measuring at each of two different positions along the conduit at least four mixture quantities, typically the sound speed, the flow velocity of the multiphase fluid, the pressure and the temperature; providing a speed of sound in each of the components at the measured pressures and temperatures; providing a trial value for each of either the component flow rates or the phase fractions; using a predetermined model to calculate values for the measured mixture quantities based on the trial values for each of either the component flow rates or the phase fractions; using a predetermined error function to determine an error value; and using a predetermined optimizing algorithm to determine whether the calculated values are acceptable, and, if they are not, to provide a new trial value for each of either the component flow rates or the phase fractions. In some applications, the error function is the sum of the squares of the difference between the measured and calculated values at each point.



WO 02/046705 A3



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INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G01F1/74

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01F

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 415 024 A (PROFFITT ARTHUR C ET AL) 16 May 1995 (1995-05-16) column 3, line 34 -column 8, line 61; figure 1	1-6
A	WO 00 19176 A (PANAMETRICS ;HAMMOND ROBERT H (US)) 6 April 2000 (2000-04-06) the whole document	1-6

☐ Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

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O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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.

Z document member of the same patent family

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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			WO	9414060 A1		23-06-1994
WO 0019176	A	06-04-2000	WO	0019176 A1		06-04-2000
			US	6216091 B1		10-04-2001