

Title (en)

MICROWAVE MEASURING ARRANGEMENT FOR DETERMINING THE LOADING OF A TWO-PHASE FLOW

Title (de)

MIKROWELLENMESSANORDNUNG ZUR BESTIMMUNG DER BELADUNG EINER ZWEIFHASENSTRÖMUNG

Title (fr)

SYSTÈME DE MESURE DE MICRO-ONDES DESTINÉ À LA DÉTERMINATION DE LA CHARGE D'UN ÉCOULEMENT BIPHASÉ

Publication

EP 3535562 A1 20190911 (DE)

Application

EP 17808750 A 20171027

Priority

- DE 102016013220 A 20161104
- DE 2017000362 W 20171027

Abstract (en)

[origin: CA3043429A1] The invention relates to a microwave measuring arrangement for determining the loading of a two-phase flow with gaseous carrier medium in a tube or channel system (1) with small and extremely small solid and/or liquid particles. To that end, microwaves, preferably having frequencies between 0.95 and 1.05 times the frequency of the waveguide fundamental wave, are coupled into an electrically conductive section of the tube or channel system (1), said section being delimited by field rods (4, 4') and thereby acting as a resonator, and the shift in the resonant frequency of the resonator on account of the loading of the carrier medium with solid and/or liquid particles is determined. In order to suppress interference resulting from microwaves which are reflected, diffracted and/or superimposed in the tube or channel system (1), two auxiliary field rods (6, 7 and 6', 7', respectively) assigned to each field rod (4, 4') are provided. The auxiliary field rods (6, 7 and 6', 7', respectively) are arranged at a small distance from the relevant field rod (4, 4') in comparison with the wavelength of the waveguide fundamental wave, and two auxiliary field rods (6, 7 and 6', 7', respectively) are arranged in each case at an angle α with respect to the field rod (4, 4') of $\alpha = +45^\circ \pm 10^\circ$ and/or $\alpha = -45^\circ \pm 10^\circ$ and/or $\alpha = +135^\circ \pm 10^\circ$ and/or $\alpha = -135^\circ \pm 10^\circ$, wherein the two auxiliary field rods (6, 7 and 6', 7', respectively) assigned to a field rod (4, 4') form an angle of $90^\circ \pm 20^\circ$. The particular advantage of the solution according to the invention consists in a simple and space-saving construction that makes it possible to integrate the measuring arrangement into an existing tube or channel system even in the case of complicated space conditions.

IPC 8 full level

G01N 15/06 (2006.01); **G01F 1/66** (2006.01); **G01F 1/708** (2006.01); **G01F 1/74** (2006.01)

CPC (source: EP KR US)

G01F 1/662 (2013.01 - KR US); **G01F 1/708** (2013.01 - KR); **G01F 1/74** (2013.01 - KR US); **G01N 15/0656** (2013.01 - EP KR); **G01F 1/662** (2013.01 - EP); **G01F 1/708** (2013.01 - EP); **G01F 1/74** (2013.01 - EP)

Citation (search report)

See references of WO 2018082726A1

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)

BA ME

DOCDB simple family (publication)

DE 102016013220 B3 20180509; AU 2017353079 A1 20190516; AU 2017353079 B2 20220728; CA 3043429 A1 20180511; CN 109906369 A 20190618; CN 109906369 B 20220322; EP 3535562 A1 20190911; JP 2020504312 A 20200206; KR 20190079647 A 20190705; MX 2019005222 A 20190624; US 10697813 B2 20200630; US 2020064167 A1 20200227; WO 2018082726 A1 20180511; ZA 201902614 B 20191127

DOCDB simple family (application)

DE 102016013220 A 20161104; AU 2017353079 A 20171027; CA 3043429 A 20171027; CN 201780067822 A 20171027; DE 2017000362 W 20171027; EP 17808750 A 20171027; JP 2019544767 A 20171027; KR 20197015510 A 20171027; MX 2019005222 A 20171027; US 201716346629 A 20171027; ZA 201902614 A 20190425