

REVISED VERSION

(19) World Intellectual Property Organization  
International Bureau



(10) International Publication Number  
WO 2017/009075 A9

(43) International Publication Date  
19 January 2017 (19.01.2017)

(51) International Patent Classification:  
G01V 1/52 (2006.01) B06B 1/06 (2006.01)  
G01V 1/02 (2006.01) B06B 3/00 (2006.01)

(21) International Application Number:  
PCT/EP2016/065627

(22) International Filing Date:  
02 July 2016 (02.07.2016)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
15176417.2 13 July 2015 (13.07.2015) EP

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR,

(54) Title: A DOWNHOLE ULTRASONIC TRANSDUCER, DOWNHOLE PROBE AND TOOL COMPRISING SUCH A TRANSDUCER

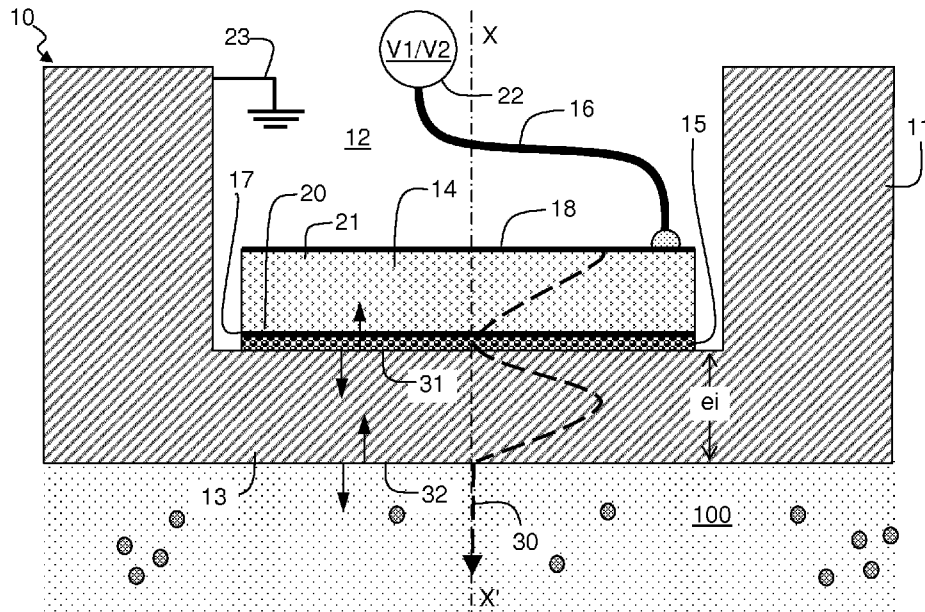


FIG. 2

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(57) Abstract: A downhole ultrasonic transducer (10) used to transmit and/or receive ultrasonic waves in a hydrocarbon well where a fluid is present comprises: - a metal housing (11) defining an internal cavity (12) isolated from the fluid of the hydrocarbon well (100) by a membrane wall (13) made of metal or metal alloy; - a piezoelectric element (14) mounted inside the internal cavity (12), the piezoelectric element (14) having a front side (20) mechanically coupled on the membrane wall (13); wherein: - the internal cavity (12) is at a pressure unrelated to a hydrocarbon well pressure; - a back side (21) of the piezoelectric element (14) is arranged to be free to oscillate in the internal cavity (12) so as to generate a high acoustic impedance mismatch between the piezoelectric element (14) and the internal cavity (12) at the back side (21) and to maximize acoustic transmission at the front side (20); and - a thickness (ei) of the membrane wall (13) is such that there is a common resonance between the membrane wall and the piezoelectric element thereby achieving high acoustic transmission through the membrane wall (13), and such that the membrane wall (13) is suitable to resist to

HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

**(84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

**Published:**

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

**(88) Date of publication of the revised international search report:**

07 December 2017 (07.12.2017)

**(15) Information about Correction:**

see Notice of 07 December 2017 (07.12.2017)

## INTERNATIONAL SEARCH REPORT

International application No PCT/EP2016/065627
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A. CLASSIFICATION OF SUBJECT MATTER INV. G01V1/52 G01V1/02 B06B1/06 B06B3/00 ADD.		
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) G01V B06B G01S G10K G01F E21B		
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 practicable, search terms used) EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
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"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "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 "&" document member of the same patent family
Date of the actual completion of the international search  30 September 2016		Date of mailing of the international search report  17/10/2017
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer  De Bekker, Ruben

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International application No  
PCT/EP2016/065627

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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International application No PCT/EP2016/065627
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