

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference WLM4-63439WO	<b>FOR FURTHER ACTION</b>	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. <b>PCT/US2018/044376</b>	International filing date ( <i>day/month/year</i> ) <b>30 July 2018 (30.07.2018)</b>	(Earliest) Priority Date ( <i>day/month/year</i> ) 04 August 2017 (04.08.2017)
Applicant <b>BAKER HUGHES, A GE COMPANY, LLC</b>		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

the international application in the language in which it was filed

a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b.  This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c.  With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2.  **Certain claims were found unsearchable** (See Box No. II)

3.  **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

as suggested by the applicant.

as selected by this Authority, because the applicant failed to suggest a figure.

as selected by this Authority, because this figure better characterizes the invention.

b.  none of the figures is to be published with the abstract.

**A. CLASSIFICATION OF SUBJECT MATTER****E21B 47/12(2006.01)i, H04B 5/00(2006.01)i**

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)  
E21B 47/12; E21B 23/14; E21B 47/00; G01V 3/00; H04B 3/54; H04B 5/00Documentation 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 modelsElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
eKOMPASS(KIPO internal) & Keywords:  
conductor assembly, communication device, borehole, deployment device, earth formation**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2016-0369622 A1 (WHEELER et al.) 22 December 2016 See paragraphs [0003], [0012]-[0020], [0045]-[0049]; and figures 1, 6.	1,4-8,10-15
Y		2-3,9
Y	US 2014-0048286 A1 (ROJAS et al.) 20 February 2014 See paragraphs [0013]-[0027]; and figures 1-3.	2-3
Y	US 2005-0056418 A1 (NGUYEN, PHILIP D.) 17 March 2005 See paragraphs [0005]-[0015]; and figures 1-2.	9
A	WO 2013-019417 A2 (BAKER HUGHES INCORPORATED et al.) 07 February 2013 See paragraphs [0024]-[0033]; and figures 1-3.	1-15
A	US 2012-0169509 A1 (COULSTON et al.) 05 July 2012 See paragraphs [0014]-[0019]; claims 1-22; and figures 1-2.	1-15

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

\* Special categories of cited documents:

"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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

13 November 2018 (13.11.2018)

Date of mailing of the international search report

**14 November 2018 (14.11.2018)**

Name and mailing address of the ISA/KR

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2018/044376**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2016-0369622 A1	22/12/2016	BR 112017026274 A2 GB 2557062 A NO 20180027 A1 WO 2016-209485 A1	11/09/2018 13/06/2018 08/01/2018 29/12/2016
US 2014-0048286 A1	20/02/2014	WO 2013-022430 A1	14/02/2013
US 2005-0056418 A1	17/03/2005	US 6978831 B2	27/12/2005
WO 2013-019417 A2	07/02/2013	AU 2012-290572 A1 AU 2012-290572 B2 BR 112014002062 A2 GB 2508740 A GB 2508740 B NO 20131665 A1 US 2013-0033383 A1 US 9217326 B2 WO 2013-019417 A3	16/01/2014 14/04/2016 21/02/2017 11/06/2014 04/07/2018 13/01/2014 07/02/2013 22/12/2015 04/04/2013
US 2012-0169509 A1	05/07/2012	AU 2011-353073 A1 AU 2011-353073 B2 DK 2659091 T3 EP 2659091 A2 EP 2659091 A4 EP 2659091 B1 US 9074463 B2 WO 2012-091791 A2 WO 2012-091791 A3	13/06/2013 18/08/2016 14/06/2018 06/11/2013 13/04/2016 28/03/2018 07/07/2015 05/07/2012 23/08/2012