

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference CT4-61201WO	FOR FURTHER ACTION	See item 4 below
International application No. PCT/US2018/027553	International filing date (<i>day/month/year</i>) 13 April 2018 (13.04.2018)	Priority date (<i>day/month/year</i>) 17 April 2017 (17.04.2017)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant BAKER HUGHES, A GE COMPANY, LLC		

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	This REPORT consists of a total of 11 sheets, including this cover sheet.																								
In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																									
3.	This report contains indications relating to the following items: <table style="width: 100%;"> <tr> <td style="width: 5%; text-align: center;">☒</td> <td style="width: 25%;">Box No. I</td> <td style="width: 70%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;">☒</td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;">☒</td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	☒	Box No. I	Basis of the report	☐	Box No. II	Priority	☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	☐	Box No. IV	Lack of unity of invention	☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	☐	Box No. VI	Certain documents cited	☒	Box No. VII	Certain defects in the international application	☐	Box No. VIII	Certain observations on the international application
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4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report 22 October 2019 (22.10.2019)
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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To: CHANDLER, KIMBERLY BAKER HUGHES, A GE COMPANY, LLC 11211 FM 2920 TOMBALL TX 77375 USA
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Date of mailing (day/month/year)	01 August 2018 (01.08.2018)
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Applicant's or agent's file reference CT4-61201WO	FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/US2018/027553	International filing date (day/month/year) 13 April 2018 (13.04.2018)	Priority date(day/month/year) 17 April 2017 (17.04.2017)
International Patent Classification (IPC) or both national classification and IPC E21B 43/12(2006.01)i, E21B 17/20(2006.01)i, E21B 33/12(2006.01)i		
Applicant BAKER HUGHES, A GE COMPANY, LLC		

1. This opinion contains indications relating to the following items:

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|-------------------------------------|--------------|--|
| ☒ | Box No. I | Basis of the opinion |
| ☐ | Box No. II | Priority |
| ☐ | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| ☐ | Box No. IV | Lack of unity of invention |
| ☒ | Box No. V | Reasoned statement under Rule 43bis. I(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement |
| ☐ | Box No. VI | Certain documents cited |
| ☒ | Box No. VII | Certain defects in the international application |
| ☐ | Box No. VIII | Certain observations on the international application |

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/KR International Application Division Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon, 35208, Republic of Korea Facsimile No. +82-42-481-8578	Date of completion of this opinion 01 August 2018 (01.08.2018)	Authorized officer PARK, Tae Wook Telephone No. +82-42-481-3405
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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2018/027553

Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established 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))

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*. I(a))

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

- a. ☐ forming part of the international application as filed:
☐ in the form of an Annex C/ST.25 text file.
☐ on paper or in the form of an image file.
- b. ☐ furnished together with the international application under PCT Rule 13*ter*. I(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
- c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*. I(a)).
☐ on paper or in the form of an image file (Rule 13*ter*. I(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2018/027553

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-18	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-18	NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following document:

D1: US 2011-0247831 A1 (SMITH et al.) 13 October 2011

1. Novelty and Inventive Step

1.1 Independent Claim 1

D1, which is considered to be the closest prior art to the subject matter of independent claim 1, discloses a fluid pumping arrangement for use in pumping a well fluid from a subterranean location in a wellbore, the fluid pumping arrangement comprising: a hydraulic engine (202); a continuous tubing (201) for disposing the hydraulic engine (202) into the wellbore; and a second tubing (19) radially surrounding the continuous tubing (201) (see paragraphs [0040]-[0042] and figure 2). Claim 1 differs from D1 in that it further comprises a dual-walled coiled tubing running string for disposing the flow actuated pump into the wellbore. However, this feature would be easily conceived from the continuous tubing (201) and the second tubing (19) disclosed in D1 (see paragraphs [0040]-[0041] and figure 2). Accordingly, claim 1 would have been obvious over D1. Therefore, claim 1 does not involve an inventive step under PCT Article 33(3).

1.2 Dependent Claims 2-8

1.2.1 Concerning Claim 2

The additional feature of claim 2 is characterized in that a first fluid flow path is defined within the inner coiled tubing string; and power fluid for actuating the flow actuated pump is

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2018/027553

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Dependent claim 10 does not refer to another claim. Therefore, claim 6 does not comply with PCT Rule 6.4(a).

(Note: This written opinion has been established on the assumption that claim 10 refers to claim 9.)

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In case the space in any of the preceding boxes is not sufficient.

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flowed to the flow actuated pump through the first fluid flow path. This feature would be easily conceived from the disclosure of D1 considering that fluid (209) is transduced down from the surface through the continuous tubing (201) through the hydraulic engine (202) and exhausted out of the hydraulic engine (202) at a motor discharge (208) (see paragraph [0041] and figure 2). Accordingly, claim 2 would have been obvious over D1. Therefore, claim 2 does not involve an inventive step under PCT Article 33(3).

1.2.2 Concerning Claim 3

The additional feature of claim 3 is identical to that the feature of D1 in that a second annular space (207) is defined radially between the continuous tubing (201) and the second tubing (19), and a third annular space (20) is defined radially between the second tubing (19) and a casing (8) (see paragraph [0041] and figure 2). Accordingly, claim 3 would have been obvious over D1. Therefore, claim 3 does not involve an inventive step under PCT Article 33(3).

1.2.3 Concerning Claim 4

The additional feature of claim 4 is characterized in that exhausted power fluid is flowed through the second fluid flow path; and the wellbore fluid is flowed through the third fluid flow path. This feature would be easily conceived from the disclosure of D1 considering that the exhausted fluid (209) mixes with the well fluid in the second annular space (207), wherein the mixture is produced to the surface along the second annular space (207), and wherein the well fluid is flowed through the third annular space (20) (see paragraph [0041] and figure 2). Accordingly, claim 4 would have been obvious over D1. Therefore, claim 4 does not involve an inventive step under PCT Article 33(3).

1.2.4 Concerning Claim 5

The additional feature of claim 5 is characterized in that: exhausted power fluid is flowed through the third fluid flow path (feature 1); and the wellbore fluid is flowed through the second fluid flow path (feature 2). Feature 1 is merely a matter of design option when the general knowledge in the relevant field of the art is used. In addition, feature 2 would be easily conceived from the disclosure of D1 considering that the exhausted fluid (209) mixes

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with the well fluid in the second annular space (207), wherein the mixture is produced to the surface along the second annular space (207) (see paragraph [0041] and figure 2). Accordingly, claim 5 would have been obvious over D1. Therefore, claim 5 does not involve an inventive step under PCT Article 33(3).

1.2.5 Concerning Claim 6

The additional feature of claim 6 is characterized in that commingled exhausted power fluid and wellbore fluid are flowed through either or both of the second and third fluid flow paths. This feature would be easily conceived from the disclosure of D1 considering that the exhausted fluid (209) mixes with the well fluid in the second annular space (207), wherein the mixture is produced to the surface along the second annular space (207) (see paragraph [0041] and figure 2). Accordingly, claim 6 would have been obvious over D1. Therefore, claim 6 does not involve an inventive step under PCT Article 33(3).

1.2.6 Concerning Claim 7

The additional feature of claim 7 is characterized in that the wellbore fluid is water. This feature would be easily conceived from the disclosure of D1 considering that the fluid pumping arrangement is used to dewater gas wells (see paragraph [0012]). Accordingly, claim 7 would have been obvious over D1. Therefore, claim 7 does not involve an inventive step under PCT Article 33(3).

1.2.7 Concerning Claim 8

The additional feature of claim 8 is identical to a sealing means (206) disclosed in D1 (see paragraph [0040] and figure 2). Accordingly, claim 8 would have been obvious over D1. Therefore, claim 8 does not involve an inventive step under PCT Article 33(3).

1.3 Independent Claim 9

D1, which is considered to be the closest prior art to the subject matter of independent claim 9, discloses a fluid pumping arrangement for dewatering a gas well, the fluid pumping arrangement comprising: a hydraulic engine (202); a continuous tubing (201) for disposing the

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In case the space in any of the preceding boxes is not sufficient.

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hydraulic engine (202) into the wellbore; a second tubing (19) radially surrounding the continuous tubing (201); a first fluid flow path defined along the continuous tubing (201); and a second annular space (207) defined radially between the continuous tubing (201) and the second tubing (19) (see paragraphs [0012], [0040]-[0042] and figure 2). Claim 9 differs from D1 in that it further comprises a dual-walled coiled tubing running string for disposing the flow actuated pump into the wellbore. However, this feature would be easily conceived from the continuous tubing (201) and the second tubing (19) disclosed in D1 (see paragraphs [0040]-[0041] and figure 2). Accordingly, claim 9 would have been obvious over D1. Therefore, claim 9 does not involve an inventive step under PCT Article 33(3).

1.4 Dependent Claims 10-14

1.4.1 Concerning Claim 10

The additional feature of claim 10 is characterized in that power fluid for actuating the flow actuated pump is flowed to the flow actuated pump through the first fluid flow path. This feature would be easily conceived from the disclosure of D1 considering that fluid (209) is transduced down from the surface through the continuous tubing (201) through the hydraulic engine (202) and exhausted out of the hydraulic engine (202) at a motor discharge (208) (see paragraph [0041] and figure 2). Accordingly, claim 10 would have been obvious over D1. Therefore, claim 10 does not involve an inventive step under PCT Article 33(3).

(Note: This written opinion has been established on the assumption that claim 10 refers to claim 9.)

1.4.2 Concerning Claim 11

The additional feature of claim 11 is identical to the feature of D1 in that a third annular space (20) is defined radially between the second tubing (19) and a casing (8) (see paragraph [0041] and figure 2). Accordingly, claim 11 would have been obvious over D1. Therefore, claim 11 does not involve an inventive step under PCT Article 33(3).

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1.4.3 Concerning Claim 12

The additional feature of claim 12 is characterized in that exhausted power fluid is flowed through the second fluid flow path; and the wellbore fluid is flowed through the third fluid flow path. This feature would be easily conceived from the disclosure of D1 considering that the exhausted fluid (209) mixes with the well fluid in the second annular space (207), wherein the mixture is produced to the surface along the second annular space (207), and wherein the well fluid is flowed through the third annular space (20) (see paragraph [0041] and figure 2). Accordingly, claim 12 would have been obvious over D1. Therefore, claim 12 does not involve an inventive step under PCT Article 33(3).

1.4.4 Concerning Claim 13

The additional feature of claim 13 is characterized in that: exhausted power fluid is flowed through the third fluid flow path (feature 1); and the wellbore fluid is flowed through the second fluid flow path (feature 2). Feature 1 is merely a matter of design option when the general knowledge in the relevant field of the art is used. In addition, feature 2 would be easily conceived from the disclosure of D1 considering that the exhausted fluid (209) mixes with the well fluid in the second annular space (207), wherein the mixture is produced to the surface along the second annular space (207) (see paragraph [0041] and figure 2). Accordingly, claim 13 would have been obvious over D1. Therefore, claim 13 does not involve an inventive step under PCT Article 33(3).

1.4.5 Concerning Claim 14

The additional feature of claim 14 is characterized in that commingled exhausted power fluid and wellbore fluid are flowed through either or both of the second and third fluid flow paths. This feature would be easily conceived from the disclosure of D1 considering that the exhausted fluid (209) mixes with the well fluid in the second annular space (207), wherein the mixture is produced to the surface along the second annular space (207) (see paragraph [0041] and figure 2). Accordingly, claim 14 would have been obvious over D1. Therefore, claim 14 does not involve an inventive step under PCT Article 33(3).

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1.5 Independent Claim 15

D1, which is considered to be the closest prior art to the subject matter of independent claim 15, discloses a method of pumping well fluid from a subterranean location in a wellbore, the method comprising the steps of: disposing a fluid pumping arrangement into the wellbore, the fluid pumping arrangement having a continuous tubing (201), a second tubing (19), and a hydraulic engine (202) affixed to the continuous tubing (201); and flowing fluid (209) through the continuous tubing (201) to actuate the hydraulic engine (202) (see paragraphs [0040]-[0042] and figure 2). Claim 15 differs from D1 in that a fluid pumping arrangement comprises a dual-walled coiled tubing running string. However, this feature would be easily conceived from the continuous tubing (201) and the second tubing (19) disclosed in D1 (see paragraphs [0040]-[0041] and figure 2). Accordingly, claim 15 would have been obvious over D1. Therefore, claim 15 does not involve an inventive step under PCT Article 33(3).

1.6 Dependent Claims 16-18

1.6.1 Concerning Claim 16

The additional feature of claim 16 is characterized in that the dual-walled coiled tubing running string includes an inner coiled tubing string and an outer coiled tubing string(36); and the power fluid is flowed through a first fluid flow path which is defined radially within the inner coiled tubing string. This feature would be easily conceived from the disclosure of D1 considering the continuous tubing (201) and the second tubing (19), wherein the fluid (209) is transduced down from the surface through the continuous tubing (201) through the hydraulic engine (202) (see paragraph [0041] and figure 2). Accordingly, claim 16 would have been obvious over D1. Therefore, claim 16 does not involve an inventive step under PCT Article 33(3).

1.6.2 Concerning Claims 17 and 18

The additional features of claims 17 and 18 are identical to that the features of D1 in that a second annular space (207) is defined radially between the continuous tubing (201) and the second tubing (19), wherein the exhausted fluid (209) mixes with the well fluid in the second annular space (207), and wherein the mixture is produced to the surface along the second

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

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annular space (207) (see paragraph [0041] and figure 2). Accordingly, claims 17 and 18 would have been obvious over D1. Therefore, claims 17 and 18 do not involve an inventive step under PCT Article 33(3).

2. Industrial Applicability

Claims 1-18 are industrially applicable under PCT Article 33(4).