

**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 <b>1392-140.00</b>	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. <b>PCT/US2016/036765</b>	International filing date ( <i>day/month/year</i> ) <b>09 June 2016 (09.06.2016)</b>	Priority date ( <i>day/month/year</i> )	
International Patent Classification (8th edition unless older edition indicated) <b>See relevant information in Form PCT/ISA/237</b>			
Applicant <b>HALLIBURTON ENERGY SERVICES, INC.</b>			

<p>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).</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>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.</p>																								
<p>3. This report contains indications relating to the following items:</p> <table> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></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><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> <p>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).</p>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<p align="center">The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No. +41 22 338 82 70</p>	<p>Date of issuance of this report <b>11 December 2018 (11.12.2018)</b></p>
	<p>Authorized officer</p> <p align="center"><b>Simin Baharlou</b></p> <p>e-mail: pct.team9@wipo.int</p>

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

# PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To: AUERBACH, ROBERT P.  KRUEGER ISELIN LLP P.O. BOX 1906 CYPRESS TX 77410-1906 USA
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Date of mailing (day/month/year) <b>07 March 2017 (07.03.2017)</b>
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Applicant's or agent's file reference 1392-140.00	<b>FOR FURTHER ACTION</b> See paragraph 2 below
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International application No. <b>PCT/US2016/036765</b>	International filing date (day/month/year) <b>09 June 2016 (09.06.2016)</b>	Priority date(day/month/year)
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International Patent Classification (IPC) or both national classification and IPC <b>C09K 8/10(2006.01)i, C09K 8/80(2006.01)i, E21B 43/267(2006.01)i</b>
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Applicant <b>HALLIBURTON ENERGY SERVICES, INC.</b>
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1. This opinion contains indications relating to the following items:

- 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.1(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.

 <p>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</p>	<p>Date of completion of this opinion  07 March 2017 (07.03.2017)</p>	<p>Authorized officer  KIM, Dong Seok  Telephone No. +82-42-481-5405</p> 
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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2016/036765

Box No. I 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 43bis.1(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 13ter.1(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 13ter.1(a)).
    - on paper or in the form of an image file (Rule 13ter.1(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/US2016/036765**

**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	<u>1-32</u>	YES
	Claims	<u>NONE</u>	NO
Inventive step (IS)	Claims	<u>NONE</u>	YES
	Claims	<u>1-32</u>	NO
Industrial applicability (IA)	Claims	<u>1-32</u>	YES
	Claims	<u>NONE</u>	NO

2. Citations and explanations :

Reference is made to the following document:

D1: US 2015-0210912 A1 (SAUDI ARABIAN OIL COMPANY) 30 July 2015

1. Novelty and Inventive Step

1.1. Claims 1 and 27

D1, which is considered to represent the most relevant state of the art, discloses a method of drilling a hydrocarbon formation, the method comprising: contacting the hydrocarbon formation with a water-based drilling mud composition while drilling or completing a well, wherein the water-based drilling mud composition comprises water and a multi-functional mud additive including psyllium husk powder (PHP) (see claim 1). D1 also discloses the water-based drilling mud composition containing the PHP, water and particles, wherein the PHP enhances the stabilization of the particles by keeping them homogeneous and suspended for a long time, and wherein the PHP also creates a good quality mudcake to control the fluid loss (see paragraph [0051]).

Claims 1 and 27 differ from D1 in that psyllium husk particulates are comprised in a diverter material. Claim 1 further differs from D1 in that the diverter material is allowed to form a diverter plug in the wellbore or the formation.

However, since the PHP of D1 also creates a mudcake to control the fluid loss (see paragraph [0051]), a person skilled in the art would have been able to easily select the difference from the disclosure of D1. Accordingly, it would have been obvious for a person skilled in the art to arrive at the subject matter of claims 1 and 27 from D1. Therefore, claims 1 and 27 lack an inventive step under PCT Article 33(3).

1.2. Claims 11 and 21

Claims 11 and 21 differ from D1 in (1) that psyllium husk particulates are comprised in a diverter

Continued on Supplemental Box

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

**PCT/US2016/036765**

**Box No. VIII Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. Claim 7, dependent on claim 5, mentions "the degrading". But a degrading has not been previously described in the claim. Thus, claim 7 is not considered to be clearly written as required by PCT Article 6.
2. The basis of percent, such as weight, volume, etc., is not suggested in claims 8 and 17. Therefore, these claims are not considered to be clearly written as required by PCT Article 6.
3. "[T]he internal breaker" in claim 15 and "the wellbore servicing fluid" in claim 21 lack a proper antecedent basis. Therefore, claims 15 and 21 are not considered to be clearly written as required by PCT Article 6.
4. It is not clear whether the "diverter fluid" at the end of claim 19 refers to the first wellbore servicing fluid or not. Similar problem is present in claim 26. Therefore, these claims are not considered to be clearly written as required by PCT Article 6.

**Supplemental Box**

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

Continuation of : Box No. V

material, in (2) comprising the step of diverting the flow of a second wellbore servicing fluid to a second location in the wellbore of formation, and in (3) comprising the step of removing a diverter plug or degrading a diverter material. Concerning the differences (1) and (2), since the PHP of D1 creates a mudcake to control the fluid loss (see paragraph [0051]), a person skilled in the art would have been able to easily select the differences from the disclosure of D1. And the difference (3) would have been easily selected by a person skilled in the art without the exercise of any inventive skill since a diverting agent is usually used for temporarily plugging a fluid path, and the PHP, which is an organic material, will be degraded when appropriately treated. Accordingly, it would have been obvious for a person skilled in the art to arrive at the subject matter of claims 11 and 21 from D1. Therefore, claims 11 and 21 lack an inventive step under PCT Article 33(3).

1.3. Claim 32

Claim 32 differs from D1 in specifying that (1) it is directed to a well treatment apparatus including a mixer and a pump, and (2) psyllium husk particulates are comprised in a diverter material and the diverter material is allowed to form a diverter plug in the wellbore or the formation.

Concerning the difference (1), a well treatment apparatus including a mixer and a pump is well known in the art. Concerning the difference (2), the same reasoning as in claims 1 and 27 applies hereto. Accordingly, it would have been obvious for a person skilled in the art to arrive at the subject matter of claim 32 from D1. Therefore, claim 32 lacks an inventive step under PCT Article 33(3).

1.4. Claims 2-10, 12-20, 22-26 and 28-31

The features of claims 2, 3, 5-9, 12, 14-18, 23-25, 28, 30 and 31 are not disclosed in D1. However, the features would have been easily selected by a person skilled in the art without the exercise of any inventive skill.

Concerning claims 4, 13, 22 and 29, D1 discloses that psyllium husk acts as a gelling agent and as a fluid loss additive (see paragraph [0044]). It is to be noted that the composition of Example 1 in D1 does not contain any other gelling agent but psyllium husk (see paragraph [0051]).

Concerning claims 10, 19 and 26, D1 discloses that the water based drilling mud comprises 2 parts per billion of 99% pure psyllium husk powder (see claim 2). The additional feature of claims 10, 19 and 26 can be appropriately optimized by a person skilled in the art without the exercise of any inventive skill.

Concerning claim 20, since D1 discloses that the water-based drilling mud composition is operable

Continued on The Next Page

**Supplemental Box**

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

Continuation of : Previous Page

for conventional drilling, fracturing and stimulation applications (see paragraph [0030]), a person skilled in the art would have selected the additional technical feature of claim 20 from D1.

Consequently, it would have been obvious for a person skilled in the art to arrive at the subject matter of claims 2-10, 12-20, 22-26 and 28-31 from D1. Therefore, these claims lack an inventive step under PCT Article 33(3).

**2. Industrial Applicability**

Claims 1-32 are industrially applicable under PCT Article 33(4).

**[NOTE]**

Box V of this written opinion has been established regarding that

- 1) claim 7 refers to claim 2 instead of claim 5;
- 2) claim 15 refers to claim 14 instead of claim 11;
- 3) “a wellbore fluid” of claim 21 is meant for ‘a wellbore servicing fluid’;
- 4) “diverter fluid” at the end of claim 19 is meant for ‘the first wellbore servicing fluid’,
- 5) “diverter fluid” at the end of claim 26 is meant for ‘the wellbore servicing fluid’, and
- 6) “the wellbore” appearing first and “the formation” in claim 32 are meant for “a wellbore” and “a formation”, respectively.

Please also note that the phrase “further comprising an internal breaker” in claim 16 is redundant.