

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year)

29 January 2021

Applicant's or agent's file reference

61SNS-507473-PCT-2

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US2020/057474

International filing date (day/month/year)

27 October 2020

Priority date (day/month/year)

30 October 2019

International Patent Classification (IPC) or both national classification and IPC

**E21B 43/013(2006.01)i; E21B 19/16(2006.01)i; E21B 43/16(2006.01)i; E21B 34/14(2006.01)i;
E21B 43/12(2006.01)i**

Applicant

BAKER HUGHES OILFIELD OPERATIONS LLC

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.

Name and mailing address of the ISA/KR

**Korean Intellectual Property Office
189 Cheongsa-ro, Seo-gu, Daejeon,
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Date of completion of this opinion

28 January 2021

Authorized officer

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**WRITTEN OPINION OF THE
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International application No.

PCT/US2020/057474

Box No. I

Basis of the 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*.1(b)).
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*.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 13*ter*.1(a)).
☐ on paper or in the form of an image file (Rule 13*ter*.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
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PCT/US2020/057474

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

1. Statement

Novelty (N)	Claims	1-25	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1-25	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1-25	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents:

D1: US 2007-0000665 A1 (TUDOR et al.) 04 January 2007
D2: WO 2014-004144 A2 (HALLIBURTON ENERGY SERVICES, INC.) 03 January 2014
D3: US 2016-0312579 A1 (TENDEKA AS.) 27 October 2016
D4: US 2015-0041148 A1 (TAM INTERNATIONAL, INC.) 12 February 2015
D5: WO 2016-114869 A1 (BAKER HUGHES INCORPORATED) 21 July 2016

I. Novelty and Inventive Step (PCT Article 33(2) and (3))

1. Claims 1-25

Claim 1 differs from any one of these prior art documents in disclosing an apparatus for selectively connecting a first fluid communication region to a further fluid communication region at a downhole location, wherein the apparatus comprises a sheath member axially slidable within a housing and biased towards a first end portion via at least one biasing element, wherein the biasing element provides a predetermined biasing force that determines a threshold pressure which must be exceeded by a fluid pressure at the first fluid communication region to permit axial movement of the sheath member away from the first fluid communication region or towards the further fluid communication region. And it is not obvious to a person skilled in the art over the documents, taken alone or in combination.

Claims 11, 20 relate to a method of selectively connecting a first fluid communication region to a further fluid communication region at a downhole location, and have substantially the same technical features as claim 1. Thus, the same reasoning as in claim 1 applies to claims 11, 20.

Claims 2-10, 12-19, 21-25 are dependent on claims 1, 11, 20, respectively.

Accordingly, claims 1-25 are novel and involve an inventive step.

(Note: The search report and the written opinion have been established on the assumptions that claims 5, 7-9 refer to claim 1; claims 13, 16-19 refer to claim 11; and claim 25 refers to claim 21.)

II. Industrial Applicability (PCT Article 33(4))

Claims 1-25 are industrially applicable.

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Box No. VII Certain defects in the international application

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

Claims 7-9, 16-19 which are multiple dependent claims, do not comply with PCT Rule 6.4(a) because the claims refer to another multiple dependent claims.