

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 PI5518WD	FOR FURTHER ACTION		See item 4 below
International application No. PCT/CN2016/072302	International filing date (<i>day/month/year</i>) 27 January 2016 (27.01.2016)	Priority date (<i>day/month/year</i>) 25 August 2015 (25.08.2015)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant HUAWEI TECHNOLOGIES CO., LTD.			

<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 8 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 checked="" 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 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 checked="" 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 type="checkbox"/>	Box No. VIII	Certain observations on the international application
<input checked="" type="checkbox"/>	Box No. I	Basis of the report																						
<input checked="" 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 type="checkbox"/>	Box No. VIII	Certain observations on the international application																						

<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 27 February 2018 (27.02.2018)</p>
	<p>Authorized officer</p> <p align="center">Lingfei Bai</p> <p>e-mail: pct.team2@wipo.int</p>

PATENT COOPERATION TREATY

TRANSLATION

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing (day/month/year)	26.05.2016
-------------------------------------	-------------------

Applicant's or agent's file reference PI5518WD	FOR FURTHER ACTION See paragraph 2 below
--	--

International application No. PCT/CN2016/072302	International filing date (day/month/year) 27.01.2016	Priority date (day/month/year) 25.08.2015
---	---	---

International Patent Classification (IPC) or both national classification and IPC
H04N 5/232 (2006.01) i; G03B 13/32 (2006.01) i; G02B 7/04 (2006.01) i

Applicant
HUAWEI TECHNOLOGIES CO., LTD.

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 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

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/CN	Date of completion of this opinion	Authorized officer
Facsimile No.		Telephone No.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/CN2016/072302

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 43*bis*.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 filed or furnished:
 - a. (means)
 - on paper
 - in electronic form
 - b. (time)
 - in the international application as filed
 - together with the international application in electronic form
 - subsequently to this Authority for the purposes of search
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 in 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/CN2016/072302

Box No. II Priority

1. The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43*bis*.1 and 64.1) is the claimed priority date.
2. This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:
[1] It has been verified that the priority claim is
 established.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No. PCT/CN2016/072302
--

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	1-16	YES
	Claims	None	NO
Inventive step (IS)	Claims	1-16	YES
	Claims	None	NO
Industrial applicability (IA)	Claims	1-16	YES
	Claims	None	NO
2. Citations and explanations:			
<p>[1] Comments are made with reference to the following documents:</p> <p>[2] D1: US 2005128308 A1 16 June 2005 (16.06.2005)</p> <p>[3] D2: CN 101500085 A 05 August 2009 (05.08.2009)</p> <p>[4] D3: CN 104580869 A 29 April 2015 (29.04.2015)</p> <p>[5] D4: CN 101656835 A 24 February 2010 (24.02.2010)</p> <p>[6] D5: JP 2013145980 A 25 July 2013 (25.07.2013)</p> <p>[7] 1. Novelty (PCT Article 33(2))</p> <p>[8] 1.1 D1 (description, paragraphs [0025]-[0038], and fig. 1-5), as the closest prior art document, discloses an imaging apparatus (2), comprising a first optical unit (4), a detector (14), a first micro-lens array (10), a second micro-lens array (12), and a drive device (18), wherein the first micro-lens array and the second micro-lens array</p>			

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/CN2016/072302

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

are provided between the first optical unit and the detector; the first micro-lens array is provided between the second micro-lens array and the first optical unit; the first micro-lens array and the second micro-lens array are provided parallel to each other; the first micro-lens array comprises $M \times N$ first micro lenses; the second micro-lens array comprises $M \times N$ second micro lenses; the first micro lenses are a lenticular array, the second micro lenses are a bi-concave array, the convex of the first micro lenses and the concave of the second micro lenses are opposite to each other, but does not have one-to-one correspondence to each other, and M and N are both positive integers and are greater than 1; the drive device is connected to the first optical unit, the detector, the first micro-lens array, and the second micro-lens array, and is used for adjusting a distance between the micro-lens array and the second micro-lens array. In addition, D1 discloses an imaging method corresponding to the imaging apparatus. However, D1 does not disclose that one of the first micro lens and the second micro lens is a plane-concave lens, and the other is plane-convex lens, and the concave and the convex of the first micro lens and the second micro lens have one-to-one correspondence to each other. In addition, in the imaging method, D1 does not likewise disclose achieving the switching between a light field mode and a non-light field mode by adjusting the distance between the first micro-lens array and the second micro-lens array.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/CN2016/072302

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

That is, the technical solutions of claims 1 and 10 are not completely disclosed by D1. Therefore, claims 1 and 10 are novel.

[9] 1.2 Claims 2-9 and 11-16 directly or indirectly refer to claim 1 or 10, and therefore are also novel.

[10] 2. Inventive step (PCT Article 33(3))

[11] 2.1 D2-D5 do not disclose that one of the first micro lens and the second micro lens is a plane-concave lens, and the other is plane-convex lens, and the concave and the convex of the first micro lens and the second micro lens have one-to-one correspondence to each other. In addition, D2-D5 do not disclose achieving the switching between the light field mode and the non-light field mode by adjusting the distance between the first micro-lens array and the second micro-lens array. Moreover, the technical features are not conventional technical means in the art, and a person skilled in the art would not be motivated or prompted to arrive at the technical solutions of claims 1 and 10 by means of substitution, combination, or modification of the prior art. Therefore, the technical solutions of claims 1 and 10 are not obvious to a person skilled in the art. Claims 1 and 10 involve an inventive step.

[12] 2.2 Claims 2-9 and 11-16 directly or indirectly refer to claim 1 or 10, and therefore involve an

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/CN2016/072302

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

inventive step.

[13] 3. Industrial applicability (PCT Article 33(4))

[14] The invention set forth in claims 1-16 satisfy the criteria set out in PCT Article 33(4) because the claimed invention can be made and/or used in industry.