

**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 1084-0011WO	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. PCT/US2007/014147	International filing date ( <i>day/month/year</i> ) 15 June 2007 (15.06.2007)	Priority date ( <i>day/month/year</i> ) 16 June 2006 (16.06.2006)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant ARTICULATED TECHNOLOGIES, LLC			

<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 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 type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																						

	Date of issuance of this report 16 December 2008 (16.12.2008)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer  <b>Athina Nickitas-Etienne</b>
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# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43*bis*.1)

To:

see form PCT/ISA/220

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/US2007/014147

International filing date (day/month/year)  
15.06.2007

Priority date (day/month/year)  
16.06.2006

International Patent Classification (IPC) or both national classification and IPC  
INV. H01L25/075 H01L33/00

Applicant  
ARTICULATED TECHNOLOGIES, 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 43*bis*.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 usually 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 66.1*bis*(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.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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Date of completion of this opinion

See form PCT/ISA/210

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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
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**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 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - a sequence listing
    - table(s) related to the sequence listing
  - b. format of material:
    - on paper
    - in electronic form
  - c. time of filing/furnishing:
    - contained in the international application as filed.
    - filed together with the international application in electronic form.
    - furnished 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 and/or table relating thereto 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:

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**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**

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1. Statement

Novelty (N)	Yes: Claims	<u>4-7,11-14,18-20</u>
	No: Claims	<u>1-3,8-10,15-17</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-20</u>
Industrial applicability (IA)	Yes: Claims	<u>1-20</u>
	No: Claims	

2. Citations and explanations

see separate sheet

**Re Item V.**

1. Reference is made to the following documents:

- D1: EP 1 465 256 A (MICRO PHOTONICS TECHNOLOGY [DK]) 6 October 2004  
D2: WO 2005/099310 A (ARTICULATED TECHNOLOGIES LLC [US]; DANIELS  
JOHN J [US]; NELSON GREGORY) 20 October 2005  
D3 : US 2005/127379 A1 (NAKATA JOSUKE [JP]) 16 June 2005

2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1,8 and 15 is not new in the sense of Article 33(2) PCT.

2.1 The document D1 discloses (the references in parentheses applying to this document): a light emitting device, comprising: a first bottom substrate having an electrically conductive surface (Fig. 2 (50); par. [0030]); a second bottom substrate having an electrically conductive surface (Fig. 2 (50); par. [0030]); a first bare die light emitting diode device having a top p junction conductor and a bottom n junction conductor (Fig. 2 (42); par. [0030], with '+' top electrode), the bottom n junction conductor in electrical communication with the electrically conductive surface of the first bottom conductor; a second bare die light emitting diode device having a top n junction conductor and a bottom p junction conductor (Fig. 2 (42); par. [0030], with '-' top electrode), the bottom p junction conductor in electrical communication with the electrically conductive surface of the second bottom conductor (Fig. 2); and a top substrate (Fig. 2; par. [0043]) having a conductive surface, said conductive surface in electrical communication with both the top p junction conductor of the first bare die light emitting diode device and the top n junction conductor of the second bare die light emitting diode device, the electrically conductive surface of the top substrate being effective for putting the first bare die light emitting diode device and the second bare die light emitting diode device into a series electrical connection.

For this reason, the subject-matter of claim 1 is not new.

2.2 The subject-matter of claims 8 and 15 is also not new for similar reasons as explained above.

3. The subject-matter of the dependent claims 2,3,9,10 and 16,17 is not new (Article 33(2) PCT) because the additional features are disclosed in D1

3.1 claims 2,9 and 16: The conductive surfaces in D1 (Fig. 2 (50); par. [0030],[0043]) have a certain resistance value and can therefore be regarded as ballast resistors.

3.2 claims 3,10 and 17: see D1 (Fig. 2, par. [0030],[0043]).

4. The subject-matter of the dependent claims 5-7,12-14,19-20 is not inventive (Article 33(3) PCT). D1 discloses that the light emitting diodes are connected to a printed circuit (par. [0043]) and it is well-known in the art that this can be achieved with the use of an adhesive or an adhesive tape. For this reason the subject-matter of claims 5-7 is not inventive, and that of claims 12-14 and 19-20 for similar reasons.

5. The subject-matter of the dependent claims 4,11 and 18 is also not inventive (Article 33(3) PCT) for the following reasons.

5.1 Notwithstanding the abovementioned objections with respect to novelty of claims 1,8 and 15, the subject-matter of these claims is not inventive in the light of the documents D2 and D3.

D2 discloses a light active sheet (p. 8-9) whereby either the n-side or p-side of the dies is in electrical communication with a top substrate and the other side in electrical communication with a bottom substrate (Fig. 88; claim 39). The difference between the subject-matter of claim 1 and D2 is that the top electrode of adjacent LED dies differs, i.e. one die has its n-side up, the other its p-side. This has the effect that the dies can be connected in series resulting in flexibility for the operating voltage of the light emitting device. The technical problem can therefore be stated as how to adapt the light emitting device of D1 to achieve flexibility in operating voltage. D3 discloses a light emitting device (par. [0001]) with light emitting diodes (Fig. 1,2 and 17; par. [0141]) arranged next to each other with n and p electrodes alternating as top electrode. D3 discloses (par. [0102]) that a serial connection of the cells, a parallel connection or a combination of both allows flexible design with respect to the operation voltage. Since D2 and D3 use very similar light emitting diodes (a bare die vs a spherical cell), the skilled person will combine D2 with the teachings of D3 and consider designing a serial connection of the bare dies whereby adjacent dies have n and p electrodes alternating as top electrode. For this reason, the subject-matter of claim 1 is not inventive in the light of D2 and D3. The subject-matter of claims 8 and 15 is not inventive for similar reasons.

5.2 D2 discloses that dies can be electrically connected in respective opposite polarity to form a light emitting device that emits light when driven with an AC voltage (Fig. 5; p. 62).

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For this reason the subject-matter of claim 4 is not inventive, and that of claims 11 and 18 for similar reasons.

6. The subject-matter of the claims 1-20 is industrially applicable (Art. 33(4) PCT).