

**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 H-719PCT	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. PCT/US2017/055540	International filing date ( <i>day/month/year</i> ) 06 October 2017 (06.10.2017)	Priority date ( <i>day/month/year</i> ) 08 October 2016 (08.10.2016)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant E INK CORPORATION			

<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 6 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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	Date of issuance of this report 09 April 2019 (09.04.2019)
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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: E INK CORPORATION  ATTN: IP DEPARTMENT 1000 TECHNOLOGY PARK DRIVE BILLERICA MA 01821-4165 USA
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Date of mailing (day/month/year) <b>29 January 2018 (29.01.2018)</b>
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Applicant's or agent's file reference H-719PCT	<b>FOR FURTHER ACTION</b> See paragraph 2 below
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International application No. <b>PCT/US2017/055540</b>	International filing date (day/month/year) <b>06 October 2017 (06.10.2017)</b>	Priority date(day/month/year) 08 October 2016 (08.10.2016)
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International Patent Classification (IPC) or both national classification and IPC <b>G09G 3/20(2006.01)i</b>
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Applicant <b>E INK CORPORATION</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 Cheongsu-ro, Seo-gu, Daejeon, 35208, Republic of Korea Facsimile No. +82-42-481-8578</p>	<p>Date of completion of this opinion</p> <p>29 January 2018 (29.01.2018)</p>	<p>Authorized officer</p> <p>YANG, Jeong Rok</p> <p>Telephone No. +82-42-481-5709</p> 
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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2017/055540

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/US2017/055540**

**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>1-7</u>	YES
	Claims	<u>NONE</u>	NO
Inventive step (IS)	Claims	<u>NONE</u>	YES
	Claims	<u>1-7</u>	NO
Industrial applicability (IA)	Claims	<u>1-7</u>	YES
	Claims	<u>NONE</u>	NO

2. Citations and explanations :

Reference is made to the following document:

D1: US 2014-0160111 A1 (BEIJING BOE DISPLAY TECHNOLOGY CO., LTD. et al.) 12 June 2014

**2.1 Novelty and Inventive step**

2.1.1 Claim 1

D1, which is considered to be the closest prior art to the subject matter of claim 1, discloses a method for driving an electro-optic display having a plurality of display pixels, the method comprising:

providing a driving circuit which may comprise a first gate drive circuit configured to provide a gate scanning signal to a gate line corresponding to a 2k-1th row of pixel units in a first time interval of a preset time period, and a second gate drive circuit configured to provide the gate scanning signal to a gate line corresponding to a 2kth row of pixel units in a second time interval of the preset time period, wherein pixel units in odd rows and even rows alternately receive the gate driving signal, wherein when the pixel units in odd rows are displaying an image, the pixel units in even rows display in black, on the contrary, when the pixel units in even rows are displaying the image, the pixel units in odd rows display in black, thereby reducing a crosstalk phenomenon of a 3D displaying (see paragraphs [0039]-[0040]; and figures 1-2 in D1).

Claim 1 differs from D1 in that at least one active portions of first and second sets of waveforms do not overlap in time. However, the difference can be easily conceived by a person skilled in the art from the features of D1 that gates of pixel units in even rows and odd rows are charged respectively by turning on a gate driving circuit at intervals (see paragraph

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**Supplemental Box**

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

Continuation of : Box No. V

[0051]; and figures 1-2 in D1). Accordingly, claim 1 would have been obvious over D1. Therefore, claim 1 is novel under PCT Article 33(2), but lacks an inventive step under PCT Article 33(3).

2.1.2 Claims 2-7

The additional feature of claim 2 can be easily conceived by a person skilled in the art from the features of D1 that  $2n$  rows and  $m$  columns of pixel units are formed on the array substrate (see paragraph [0045]; and figure 1 in D1). Accordingly, claim 2 would have been obvious over D1. Therefore, claim 2 lacks an inventive step under PCT Article 33(3).

The additional feature of claim 3 can be easily conceived by a person skilled in the art from the feature of D1 that the driving circuit may comprise a first gate drive circuit configured to provide the gate scanning signal to a gate line corresponding to the  $2k-1$ th row of pixel units in the first time interval of the preset time period, and a second gate drive circuit configured to provide the gate scanning signal to a gate line corresponding to the  $2k$ th row of pixel units in the second time interval of the preset time period (see paragraph [0040]; and figures 1-2 in D1). Accordingly, claim 3 would have been obvious over D1. Therefore, claim 3 lacks an inventive step under PCT Article 33(3).

The additional features of claims 4-5 are merely matters of design option in view of the feature of D1 that the TFTs of the pixel units will not be turned on until the gate scanning signal is received by the gate lines corresponding to the pixel units, therefore, the pixel units may not display an image, and display in black (see paragraph [0049] in D1). Accordingly, claims 4-5 would have been obvious over D1. Therefore, claims 4-5 lack an inventive step under PCT Article 33(3).

The additional features of claims 6-7 are merely matters of design option in view of the feature of D1 that during the time interval, each of the gate lines corresponding to the 2nd row, the 4th row, ..., the  $2k$ th row, ..., the  $2n$ th row of pixel units receives the gate scanning signal in turn, which results in that the image displaying by the pixel units in even rows is implemented, wherein the gate lines corresponding to the 1st row, the 3rd row, ..., the  $2k-1$ th row, ..., the  $2n-1$ th row of pixel units do not receive the gate scanning signal, i.e. the display of the pixel units in odd rows is in black, and wherein the gates of the pixel units in even

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**Supplemental Box**

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

Continuation of : Previous Page

rows and odd rows are charged respectively by turning on the gate driving circuit at intervals (see paragraphs [0036], [0051] in D1). Accordingly, claims 6-7 would have been obvious over D1. Therefore, claims 6-7 lack an inventive step under PCT Article 33(3).

**2.2 Industrial Applicability**

Claims 1-7 are industrially applicable under PCT Article 33(4).