

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To: Y.P.LEE, MOCK & PARTNERS 12F Daelim Acrotel, 13 Eonju-ro 30-gil Gangnam-Gu Seoul 06292 Republic of Korea		Date of mailing (day/month/year) 09 March 2020 (09.03.2020)	
Applicant's or agent's file reference CY-60623-PCT		FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/KR2019/016290	International filing date (day/month/year) 25 November 2019 (25.11.2019)	Priority date(day/month/year) 27 November 2018 (27.11.2018)	
International Patent Classification (IPC) or both national classification and IPC G02B 27/01(2006.01)i			
Applicant CORNING PRECISION MATERIALS 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 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 International Application Division Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon, 35208, Republic of Korea Facsimile No. +82-42-481-8578	Date of completion of this opinion 06 March 2020 (06.03.2020)	Authorized officer KANG, Sung Chul Telephone No. +82-42-481-8405
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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

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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(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:

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

the entire international application

claims Nos. 6-24,28-58

because:

the said international application, or the said claims Nos. _____
relate to the following subject matter which does not require an international search (*specify*):

the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 8,15,17-18,23,29-30,33,35-36,45,47,49,57
are so unclear that no meaningful opinion could be formed (*specify*):

Claims 8,15,17-18,23,29-30,33,35-36,45,47,49,57 are regarded to be unclear because the claims refer to multiple dependent claims which do not comply with PCT Rule 6.4(a).

the claims, or said claims Nos. _____ are so inadequately supported
by the description that no meaningful opinion could be formed (*specify*):

no international search report has been established for said claims Nos. 6-24,28-58

a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13ter.1(a) or (b).

See Supplemental Box for further details.

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International application No.

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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

1. Statement

Novelty (N)	Claims	<u>1-5,25-27</u>	YES
	Claims	<u>NONE</u>	NO
Inventive step (IS)	Claims	<u>NONE</u>	YES
	Claims	<u>1-5,25-27</u>	NO
Industrial applicability (IA)	Claims	<u>1-5,25-27</u>	YES
	Claims	<u>NONE</u>	NO

2. Citations and explanations :

Reference is made to the following document:

D1: US 2016-0039705 A1 (JAPAN 3D DEVICES CO., LTD.) 11 February 2016

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

1. Claims 1-5

1.1. Claim 1

D1, which is considered to be the closest prior art to the subject matter of claim 1, discloses head-up display concave mirrors; and glass plates used as glass substrates for head-up display concave mirrors (see paragraph [0036] and figures 1-2 in D1).

Claim 1 differs from D1 in that a first major surface comprises a first surface roughness Ra of 3 nm or less and a peak to valley (PV) roughness of less than 30 nm. However, this different feature is merely a variation of the disclosure of D1 in that a resultant bent glass plate has a PV value of 50 μm or less and a Ra value of 5 nm or less, wherein the PV value represents a difference between the highest point (peak) and the lowest point (valley) in the measured range and the Ra value represents surface roughness (see paragraphs [0029], [0052] and figures 1-2 in D1), and a person skilled in the art would arrive at the claimed invention by general experimentation alone without exercising any ingenuity.

Accordingly, claim 1 would have been obvious over D1. Therefore, claim 1 lacks an inventive step.

Continued on Supplemental Box

**WRITTEN OPINION OF THE
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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 6-7,9-14,16,19-22,24,28,31-32,34,37-44,46,48,50-56,58, which are multiple dependent claims, do not comply with Rule 6.4(a) because the claims refer to other multiple dependent claims.

Supplemental Box

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

Continuation of : Box No. V

1.2. Claims 2-5

The additional features of claims 2-3 are merely variations of the disclosure of D1 in that in fabricating the bent glass plate for optical use by press-molding a glass plate, it is preferable that the glass plate periphery is employed edge chamfering (see paragraphs [0036]-[0037] and figures 1-2 in D1), and a person skilled in the art would arrive at the claimed inventions by general experimentation alone without exercising any ingenuity.

The additional feature of claim 4 further specifies that the chamfer is a C chamfer or an R chamfer. However, the additional feature of claim 4 is merely a matter of design option when the general knowledge in the relevant field of the art is used.

The additional feature of claim 5 further specifies that the C chamfer is 0.1 mm or greater, or 0.3 mm or greater. However, the additional feature of claim 5 is merely a matter of design option when the general knowledge in the relevant field of the art is used.

Accordingly, claims 2-5 would have been obvious over D1. Therefore, claims 2-5 lack an inventive step.

2. Claims 25-27

2.1. Claim 25

D1, which is considered to be the closest prior art to the subject matter of claim 25, discloses providing a flat glass plate used as glass substrates for head-up display concave mirrors; and inserting the glass plate (11) between a pair of upper and lower press dies (12, 13) and press-molding the glass plate (11) inserted at a predetermined position between the press dies (12, 13) by applying a press pressure (see paragraphs [0013], [0032]-[0033], [0036] and figures 1-2 in D1).

Claim 25 differs from D1 in disposing a mirror preform on a molding apparatus having a curved support surface such that a second major surface is facing the curved support surface, wherein after the step of conforming, the concave surface has a roughness Ra of less than 3 nm and a peak to valley (PV) roughness of less than 30 nm. However, these different features

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Supplemental Box

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

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are merely variations of the disclosure of D1 in disposing the glass plate (11) on a soaking plate (16); and a resultant bent glass plate having a PV value of 50 μm or less and a Ra value of 5 nm or less, wherein the PV value represents a difference between the highest point (peak) and the lowest point (valley) in the measured range and the Ra value represents surface roughness (see paragraphs [0027], [0029], [0052] and figures 1-2 in D1), and a person skilled in the art would arrive at the claimed invention by general experimentation alone without exercising any ingenuity.

Accordingly, claim 25 would have been obvious over D1. Therefore, claim 25 lacks an inventive step.

2.2. Claims 26-27

The additional feature of claim 26 is merely a variation of the disclosure of D1 in that in fabricating the bent glass plate for optical use by press-molding a glass plate, it is preferable that the glass plate periphery is employed edge chamfering, general edge flat polish, and other techniques are sufficient (see paragraphs [0036]-[0037] and figures 1-2 in D1), and a person skilled in the art would arrive at the claimed invention by general experimentation alone without exercising any ingenuity.

The additional feature of claim 27 further specifies that the minor surface comprises a cross-sectional edge profile that is identical to a cross-sectional edge profile of the curved mirror substrate. However, the additional feature of claim 27 is merely a matter of design option when the general knowledge in the relevant field of the art is used.

Accordingly, claims 26-27 would have been obvious over D1. Therefore, claims 26-27 lack an inventive step.

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

Claims 1-5, 25-27 are industrially applicable.