

**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 17P21005PCT	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. PCT/JP2018/014169	International filing date ( <i>day/month/year</i> ) 02 April 2018 (02.04.2018)	Priority date ( <i>day/month/year</i> ) 31 March 2017 (31.03.2017)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant HOYA 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 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 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
<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																						

	Date of issuance of this report 01 October 2019 (01.10.2019)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer  Miki Kobayashi
Facsimile No. +41 22 338 82 70	e-mail: pct.team8@wipo.int

**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)	<b>03.07.2018</b>
-------------------------------------	-------------------

Applicant's or agent's file reference <b>17P21005PCT</b>
---

<b>FOR FURTHER ACTION</b> See paragraph 2 below
--

International application No. <b>PCT/JP2018/014169</b>	International filing date (day/month/year) <b>02.04.2018</b>	Priority date (day/month/year) <b>31.03.2017</b>
---	---	---

International Patent Classification (IPC) or both national classification and IPC <b>G11B5/73 (2006.01) i, G11B5/82 (2006.01) i</b>
--

Applicant <b>HOYA CORPORATION</b>
--------------------------------------

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

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2018/014169

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/JP2018/014169

<b>Box No. V</b>	<b>Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</b>		
1. Statement	Novelty (N)	Claims <u>1-8</u>	YES
		Claims _____	NO
	Inventive step (IS)	Claims _____	YES
		Claims <u>1-8</u>	NO
	Industrial applicability (IA)	Claims <u>1-8</u>	YES
		Claims _____	NO
2. Citations and explanations:	<p>Document 1: JP 07-057233 A (HITACHI, LTD.) 03 March 1995, paragraphs [0026], [0029] (Family: none)</p> <p>Document 2: JP 2005-346880 A (TOSHIBA CORP.) 15 December 2005, claim 2, paragraph [0004] &amp; WO 2005/122148 A1, claim 2, page 1, line 28 to page 2, line 4</p> <p>Document 3: JP 2005-322364 A (FUJI ELECTRIC DEVICE TECHNOLOGY CO., LTD.) 17 November 2005, fig. 2 (Family: none)</p> <p>Document 4: JP 2009-160831 A (FUJIFILM CORP.) 23 July 2009, paragraphs [0024], [0044] (Family: none)</p> <p>Document 5: JP 2006-085887 A (SHOWA DENKO KABUSHIKI KAISHA) 30 March 2006, claim 4 &amp; US 2008/0085428 A1, claim 4 &amp; WO 2006/019125 A1</p> <p>Document 6: JP 2006-260700 A (FUJITSU LTD.) 28 September 2006, paragraphs [0033]-[0035] (Family: none)</p>		

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2018/014169

**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

The invention as in claims 1, 3, and 8 of the present application does not involve an inventive step in the light of that which is described in documents 1 and 2 cited in the ISR.

Document 1 describes an aluminum alloy substrate for magnetic disk in which a 20  $\mu\text{m}$ -thick Ni-12 wt.% P plating (corresponding to the metal film of a material having a loss coefficient value of 0.01 or higher of the present application) is applied on both surfaces of a substrate.

The invention described in document 1 differs from the invention as in claims 1, 3, and 8 of the present application in that the thickness of the substrate and the ratio of the thickness of the substrate over the thickness of the metal film are different. However, a person skilled in the art could optimize, as appropriate, the thickness of a substrate or a metal film of a magnetic disk in order to increase the capacity of a hard disk device. Setting the total (T+D) of the thickness T of the substrate body and the thickness D of the metal film to 0.700 mm or less, or setting D/T to 0.025 or more is not considered to be special. For example, document 2 describes a substrate for magnetic recording medium in which a Ni-P-based alloy film is formed to a thickness of about 10  $\mu\text{m}$  on a substrate having a thickness of 0.6 mm to 0.25 mm. Here, when the substrate thickness is 0.4 mm, the value corresponding to D+T in the present application becomes 0.41 mm and the value corresponding to D/T becomes 0.025.

It is considered that a person skilled in the art could easily conceive of the invention as in claims 1, 3, and 8 of the present application, by exercising ordinary creative ability, on the basis of that which is described

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2018/014169

**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**

in documents 1 and 2.

The invention as in claim 4 of the present application does not involve an inventive step in the light of that which is described in documents 1 and 2 cited in the ISR.

Optimizing the external shape of a magnetic disk substrate is a design matter. Document 1 indicates that the external shape of the magnetic disk substrate is 130 mm.

It is considered that a person skilled in the art could easily conceive of the invention as in claim 4 of the present application, by exercising ordinary creative ability, on the basis of that which is described in documents 1 and 2.

The invention as in claim 2 of the present application does not involve an inventive step in the light of that which is described in documents 1-3 cited in the ISR.

Document 3 describes a magnetic disk substrate in which a Ni-P film (corresponding to the metal film of the present application) is provided on a main surface and an end surface of a substrate. Because documents 1-3 belong to the common technical field of substrates for magnetic recording media having a Ni-P film on the surface, adopting the configuration of document 3 in the invention of document 1 is the exercise of ordinary creative ability of a person skilled in the art.

It is considered that a person skilled in the art could easily conceive of the invention as in claim 2 of the present application, by exercising ordinary creative

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2018/014169

**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

ability, on the basis of that which is described in documents 1-3.

The invention as in claim 5 of the present application does not involve an inventive step in the light of that which is described in documents 1-4 cited in the ISR.

Document 4 indicates that the Vickers hardness of a Ni-P film is 600.

It is considered that a person skilled in the art could easily conceive of the invention as in claim 5 of the present application, by exercising ordinary creative ability, on the basis of that which is described in documents 1-4.

The invention as in claim 6 of the present application does not involve an inventive step in the light of that which is described in documents 1-5 cited in the ISR.

Optimizing the maximum height of the outer perimeter end surface of a substrate body is a design matter. Document 5 indicates that the maximum height  $R_{max}$  of the end surface of a substrate for magnetic recording medium is optimized.

It is considered that a person skilled in the art could easily conceive of the invention as in claim 6 of the present application, by exercising ordinary creative ability, on the basis of that which is described in documents 1-5.

The invention as in claim 7 of the present application does not involve an inventive step in the

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2018/014169

**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

light of that which is described in documents 1-6 cited in the ISR.

Document 6 indicates that surface bumps and pits produced on the surface of a magnetic recording medium can be mitigated by a Ni-P film.

It is considered that a person skilled in the art could easily conceive of the invention as in claim 7 of the present application, by exercising ordinary creative ability, on the basis of that which is described in documents 1-6.