

**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 FP18-0050-00	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. PCT/JP2018/004071	International filing date ( <i>day/month/year</i> ) 06 February 2018 (06.02.2018)	Priority date ( <i>day/month/year</i> ) 14 April 2017 (14.04.2017)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant MITSUI HIGH-TEC, INC.			

<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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	Date of issuance of this report 15 October 2019 (15.10.2019)
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**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>03.04.2018</b>
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Applicant's or agent's file reference <b>FP18-0050-00</b>	<b>FOR FURTHER ACTION</b> See paragraph 2 below
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International application No. <b>PCT/JP2018/004071</b>	International filing date (day/month/year) <b>06.02.2018</b>	Priority date (day/month/year) <b>14.04.2017</b>
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International Patent Classification (IPC) or both national classification and IPC  
**B23K26/00 (2014.01) i**

Applicant  
**mitsui HIGH-TEC, INC.**

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

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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 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:

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<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>
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1. Statement			
Novelty (N)	Claims	1-21	YES
	Claims	_____	NO
Inventive step (IS)	Claims	1-9, 13, 18-21	YES
	Claims	10-13, 15-17	NO
Industrial applicability (IA)	Claims	1-21	YES
	Claims	_____	NO

2. Citations and explanations:	
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Document 1: JP 2011-212728 A (PANASONIC ELECTRIC WORKS SUNX CO., LTD.) 27 October 2011, paragraphs [0002], [0029]-[0093], fig. 1-4 (Family: none)

Document 2: JP 4575812 B2 (KEYENCE CORP.) 04 November 2010, paragraphs [0018]-[0061], fig. 7 (Family: none)

Document 3: JP 2002-205178 A (HITACHI CONSTRUCTION MACHINERY CO., LTD.) 23 July 2002, paragraphs [0011]-[0040], fig. 1-7 (Family: none)

The "identification code" of the claims is "capable of retaining individual information by means of a combination of a bright pattern and a dark pattern", as described in the description (paragraph [0019]), and specifically represents a "barcode" or "two-dimensional code".

Therefore, a marked pattern which is a simple character pattern does not correspond to this "identification code" as described below.

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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**

For example, document 3 cited in the ISR indicates that a groove is formed in the surface of a workpiece, and a marked pattern such as a character pattern or the like is also formed.

However, even though a person skilled in the art could easily conceive of the feature in which a plurality of rows of marking are formed in a direction different from a groove forming direction according to the contents of a character pattern and the groove forming direction in which a plurality of rows of grooves are arranged since said feature is disclosed in document 3, said feature does not fall within the range of the present application in view of the above interpretation of the "identification code". Thus, an assessment is made as below.

The invention as in claims 1-9, 14, and 18-21 is not disclosed in any of the documents cited in the ISR, and would not be obvious to a person skilled in the art.

Thus, the invention as in claims 1-9, 14, and 18-21 is novel and involves an inventive step.

In particular, none of the documents indicate or suggest that a plurality of rows of a base region are formed by scanning a laser beam along a first direction, a plurality of rows of marking are formed by scanning a laser beam along a second direction that is different from the first direction, and an identification code configured by forming a prescribed shape by combining the base region and the marking is provided on the surface of a metal member.

The invention as in claims 10-11 does not involve an

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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**

inventive step in light of documents 1-2 cited in the ISR.

Document 1 is considered to disclose a metal product manufacturing method including: forming a marking by irradiating the surface of a metal member with a marking laser beam, which is laser light having a pulse shape (paragraphs [0030], [0047]: pulse oscillation), wherein the marking is configured with a combination of cells having a square shape; and irradiating each of the cells with the marking laser beam.

Document 2 (paragraphs [0045]-[0046]) indicates that a portion, which is to be printed by laser light, of a two-dimensional code is scanned at a prescribed arrangement pitch in a row direction to shade the entirety of a rectangular region.

It would not be particularly difficult for a person skilled in the art to apply the feature disclosed in document 2 to the invention disclosed in document 1 such that when marking by irradiating a plurality of cells having a square shape with laser, scanning is performed at a feed pitch which is not greater than a spot diameter in a first direction and at a prescribed arrangement pitch in a row direction, and each of the cells is irradiated with a marking laser beam so as to satisfy the expression  $b \times n/a \geq 0.5$  or the expression  $b \times n/a \geq 1$  where

a: the length of one side of the cell

b: the pulse diameter of the marking laser beam

n: the number of scans by the marking laser beam for each one cell.

The invention as in claims 12-13 and 15 does not involve an inventive step in light of documents 1-2.

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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

The "second direction" specified in claims 12-13 and 15 includes the same direction as the "first direction", and an assessment is made as below.

Although document 1 indicates that a base portion (inverted symbol) is also irradiated with a laser beam, it would not be particularly difficult for a person skilled in the art to apply the feature disclosed in document 2 such that laser is scanned so as to shade the entirety of a base portion, thereby arriving at the invention as in claims 12-13 and 15.

The invention as in claims 16-17 does not involve an inventive step in light of documents 1-2.

Document 1 (paragraphs [0059]-[0061]) indicates that laser power P1 that enables drawing of a black cell 61a is different from laser power P2 that enables drawing of a white cell 61b.