

**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>23.03.2017</b>
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Applicant's or agent's file reference <b>P16S035LP</b>	<b>FOR FURTHER ACTION</b> See paragraph 2 below
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International application No. <b>PCT/CN2016/111810</b>	International filing date (day/month/year) <b>23.12.2016</b>	Priority date (day/month/year) <b>01.06.2016</b>
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International Patent Classification (IPC) or both national classification and IPC  
**G01D 5/12 (2006.01) i; H02K 11/215 (2016.01) i**

Applicant  
**JIANGSU SENTRONIC ELECTRONICS TECHNOLOGY 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/CN	Date of completion of this opinion	Authorized officer
Facsimile No.		Telephone 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(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 filed or furnished:
  - a. (means)
    - on paper
    - in electronic form
  - b. (time)
    - in the international application as filed
    - together with the international application in electronic form
    - 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 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. II

Priority

1.  The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43*bis*.1 and 64.1) is the claimed priority date.
2.  This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:  
[1] Upon verification, the priority claim of the present international application is found to be valid.

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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>		
1. Statement			
Novelty (N)	Claims	1-10	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-10	NO
Industrial applicability (IA)	Claims	1-10	YES
	Claims	None	NO
2. Citations and explanations:			
<p>[1] Reference is made to the following documents:</p> <p>[2]                   D1:    JP 2004117101 A, 15 April 2004                               (15.04.2004)</p> <p>[3]                   D2:    CN 2788137 Y, 14 June 2006                               (14.06.2006)</p> <p>[4]    1. Novelty</p> <p>[5]    1.1 D1 is considered to be the prior art closest to the subject matter of independent claim 1. D1 (see description, paragraphs [0014] to [0015], and figure 2) discloses a magnetic encoder device, comprising: a bias magnet 6g (equivalent to a permanent magnet) and a rotating disc 2 connected to the shaft 10 of a motor 9; in the rotating disc 2, the periphery of an annular soft magnet is provided with radial slits at predetermined intervals, thus forming a magnetic flux portion 11b and a magnetic shielding portion 12b by</p>			

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alternating slits; a magnetic sensor 3g is disposed opposite to the positions of the slits of the rotating disc 2; a signal processing circuit 15 processes signals from the magnetic sensor 3g. It can be determined that the soft magnet is a magnetically conductive material; the rotating disc 2 is equivalent to a magnetically conductive code disc; the magnetic flux portion 11b is equivalent to a magnetically conductive portion; the magnetic shielding portion 12b is equivalent to a non-magnetically conductive region, all of which together form a magnetic grid. Claim 1 differs from D1 in that: the permanent magnet is connected to the shell of a motor. Thus, D1 does not disclose the technical solution of claim 1. Claims 1-8 are novel in the sense of PCT Article 33(2).

[6] 1.2 Independent claim 9 sets forth a magnetically conductive code disc of the encoder of any one of claims 1-7. Independent claim 10 sets forth a method for manufacturing the magnetically conductive code disc of claim 9. On the basis of 1.1, D1 also does not disclose the technical solutions of claims 9 and 10. Claims 9 and 10 are novel in the sense of PCT Article 33(2).

[7] 2. Inventive Step

[8] 2.1 According to the distinguishing technical features in 1.1, it can be determined that the technical problem to be solved by claim 1 is how

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to generate a stable magnetic field. However, the position of a permanent magnet can be selected by a person skilled in the art without affecting the generation of the desired magnetic field. Changing the position of a bias magnet in D1 from being located above a rotating disc to being connected to the shell of a motor could be easily conceived of with reference to the technical knowledge in the art. Thus, the technical solution of claim 1 would be obvious to a person skilled in the art and does not involve an inventive step in the sense of PCT Article 33(3).

- [9] 2.2 The first technical solution of dependent claim 2 is disclosed by D1 (see description, paragraphs [0014] to [0015], and figure 2); the second technical solution can be obtained under the inspiration of D2 (see description, page 2, line 15 to page 3, line 22, and figures 1 to 3). The additional technical features of dependent claim 3 are also disclosed by D1 (see description, page 2, line 15 to page 3, line 22, and figures 1 to 3). The additional technical features of dependent claims 4-6 and 8 are common technical means in the art. Most of the additional technical features of dependent claim 7 are also disclosed by D1 (see description, paragraphs [0014] to [0015], and figure 2). Using a Hall element as a sensor is common general knowledge in the art. Thus, claims 2-8 do not involve an inventive step in the sense of PCT Article 33(3).

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[10] 2.3 On the basis of 2.1 and 2.2, the technical solutions of claims 9 and 10 would also be obvious to a person skilled in the art and do not involve an inventive step in the sense of PCT Article 33(3).

[11] 3. Industrial Applicability

[12] The subject matter of claims 1-10 can be made or used in industry; thus, said claims are industrially applicable in the sense of PCT Article 33(4).