

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: 528000 China No.7 Huabaonan Road, Chengxi Industrial Park, Foshan National HI-TECH Industrial Zone Chancheng District,, Foshan, Guangdong FOSHAN ICHIKOH VALEO AUTO LIGHTING SYSTEMS CO., LTD.
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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference 2017P01071WO	Date of mailing (day/month/year) 03 March 2020	
FOR FURTHER ACTION See paragraph 2 below		
International application No. PCT/CN2019/121142	International filing date (day/month/year) 27 November 2019	Priority date (day/month/year) 27 November 2018
International Patent Classification (IPC) or both national classification and IPC H02H 3/10(2006.01)i; H02H 1/06(2006.01)i		
Applicant FOSHAN ICHIKOH VALEO AUTO LIGHTING SYSTEMS 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/ National Intellectual Property Administration, PRC China 6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing 100088	Date of completion of this opinion 25 February 2020	Authorized officer HAN,Xiao
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WRITTEN OPINION OF THE
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International application No.

PCT/CN2019/121142

Box No. I Basis of the 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:
 - 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:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/CN2019/121142

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**

1. Statement

Novelty (N)	Claims	<u>1-16</u>	YES
	Claims	<u>None</u>	NO
Inventive step (IS)	Claims	<u>8, 12</u>	YES
	Claims	<u>1-7, 9-11, 13-16</u>	NO
Industrial applicability (IA)	Claims	<u>1-16</u>	YES
	Claims	<u>None</u>	NO

2. Citations and explanations :

[1] **I. Cited document**

[2] D1: CN 207732414U, 14 Aug. 2018 (14.08.2018)

[3] **II. Novelty and Inventive Step**

[4] D1 discloses a protection circuit for short circuit protection(see description, paragraphs 10-12 and figure 1), the protection circuit comprising: a high conduction circuit Q4 for controlling the supply of electric power for a functional circuit, wherein the functional circuit has a boost function; and a charging subcircuit Q7,R27,R30,R21,D7 for controlling, based on an output voltage from the functional circuit, the high conduction circuit Q4 to be turned on or turned off; and an energy storage circuit C50 for storing electric power from the input power source so as to provide electric power for the functional circuit.

[5] The distinguishing technical features between claim 1 and D1 are those: (1) claim1 claims a protection circuit for ground short circuit protection; (2) the charging subcircuit also bases on an input voltage of an input power source of the protection circuit for controlling.

[6] D1 does not disclose all the features of claim 1, therefore claims 1 and 2-16 (refer to claim 1 directly or indirectly) are novel in the sense of PCT Article 33(2).

[7] The distinguishing technical features are commonly known in the art. Therefore claim 1 does not satisfy the criteria of PCT Article 33(3).

[8] D1 further discloses the following contents(see description, paragraphs 10-12 and figure 1): a first terminal of the charging subcircuit is connected to the input power source BAT-, and a second terminal 2 thereof is connected to an output terminal of the functional circuit; and a first terminal of the high conduction circuit Q4 is connected to the input power source BAT+, a second terminal thereof is connected to an input terminal 1 of the functional circuit via the energy storage circuit C50, and a control terminal thereof is connected to an output terminal of the charging subcircuit, wherein the high conduction circuit Q4 is configured to be turned on in response to the control terminal thereof being at a low voltage and to be turned off in response to the control terminal thereof being at a high voltage; the high conduction circuit Q4 uses one PMOS transistor; the energy storage circuit comprises a first capacitor C50, one end of the first capacitor C50 is connected to the input terminal 1 of the functional circuit, and the other end thereof is grounded; when the high conduction circuit uses a single PMOS transistor Q4, a gate electrode of the single PMOS transistor Q4 is connected to the third terminal of the charging subcircuit as a control terminal; the functional circuit is a DC-DC conversion circuit; the step of controlling, according to the output voltage of the functional circuit, the high conduction circuit Q4 to be turned on or turned off further comprises: in response to the output voltage being a high voltage, completely turning on the high conduction circuit Q4; and in response to the output voltage being a low voltage, turning off the high conduction circuit Q4.

[9] Claim 9 does not satisfy the criteria of PCT Article 33(3).

[10] The additional technical features undisclosed by D1 of claims 2-7 are commonly known in the art. Therefore claims 2-7 do not satisfy the criteria of PCT Article 33(3).

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/CN2019/121142

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

- [11] The additional technical features of claims 8, 12 are not commonly known in the art, furthermore, as the available prior art neither discloses nor teaches this technique, claims 8, 12 meet the requirements of PCT Article 33(3).
- [12] Claims 10(refers to claims 1-7, 9), 11 do not satisfy the criteria of PCT Article 33(3).
- [13] Claims 10(refers to claim 8), 11 meet the requirements of PCT Article 33(3).
- [14] Claims 13(refers to claims 1-7, 9), 14-16(the technical features undisclosed by D1 of claims 15, 16 are commonly known in the art) do not satisfy the criteria of PCT Article 33(3).
- [15] Claims 13(refers to claim 8), 14-16 meet the requirements of PCT Article 33(3).
- [16] **III. Industrial Applicability**
- [17] The technical solution of claims 1-16 are industrially applicable, and thus said claims meet the criteria of PCT Article 33(4).