

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>2017P01071WO</b>	<b>FOR FURTHER ACTION</b>	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. <b>PCT/CN2019/121142</b>	International filing date ( <i>day/month/year</i> ) <b>27 November 2019</b>	(Earliest) Priority Date ( <i>day/month/year</i> ) <b>27 November 2018</b>
Applicant <b>FOSHAN ICHIKOH VALEO AUTO LIGHTING SYSTEMS CO., LTD.</b>		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out 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)).

b.  This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c.  With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2.  **Certain claims were found unsearchable** (see Box No. II).

3.  **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

as suggested by the applicant.

as selected by this Authority, because the applicant failed to suggest a figure.

as selected by this Authority, because this figure better characterizes the invention.

b.  none of the figures is to be published with the abstract.

**Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)**

A protection circuit(100) for ground short circuit protection, the circuit(100) comprising: a high conduction circuit(110) for controlling the supply of electric power for a functional circuit(1000), wherein the functional circuit(1000) has a boost function; and a charging subcircuit(120) for controlling, based on an input voltage of an input power source of the protection circuit(100) and an output voltage from the functional circuit(1000), the high conduction circuit(110) to be turned on or turned off; and an energy storage circuit(130) for storing electric power from the input power source so as to provide electric power for the functional circuit(1000).

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/121142

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
H02H 3/10(2006.01)i; H02H 1/06(2006.01)i		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) H02H; H02M; H03K		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNPAT, WPI, EPODOC, CNKI, IEEE: short circuit, over current, load, protect+, ground, boost, charg+, input voltage, output voltage, on, off, start+, partial, incomplete, capaci+, diode, switch+		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 207732414 U (HANGZHOU GUANGDI NEW ENERGY TECH. CO., LTD.) 14 August 2018 (2018-08-14) description, paragraphs 10-12 and figure 1	1-7, 9-11, 13-16
A	CN 107834826 A (CHINESE AERONAUTICAL RADIO ELECTRONICS RES. INST.) 23 March 2018 (2018-03-23) the whole document	1-16
A	CN 205545180 U (KONKA GROUP CO., LTD.) 31 August 2016 (2016-08-31) the whole document	1-16
A	JP H05304766 A (NEC CORP.) 16 November 1993 (1993-11-16) the whole document	1-16
A	JP 2008086134 A (MATSUSHITA ELECTRIC IND. CO., LTD.) 10 April 2008 (2008-04-10) the whole document	1-16
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search <b>22 February 2020</b>		Date of mailing of the international search report <b>03 March 2020</b>
Name and mailing address of the ISA/CN <b>National Intellectual Property Administration, PRC 6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing 100088 China</b>		Authorized officer  <b>HAN,Xiao</b>
Facsimile No. <b>(86-10)62019451</b>		Telephone No. <b>86-(10)-53961266</b>

**INTERNATIONAL SEARCH REPORT**  
**Information on patent family members**

International application No.

**PCT/CN2019/121142**

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	207732414	U	14 August 2018	None			
CN	107834826	A	23 March 2018	None			
CN	205545180	U	31 August 2016	None			
JP	H05304766	A	16 November 1993	None			
JP	2008086134	A	10 April 2008	JP	4820257	B2	24 November 2011