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- (81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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(54) Title: LIQUID COOLED CHARGING CABLE SYSTEM

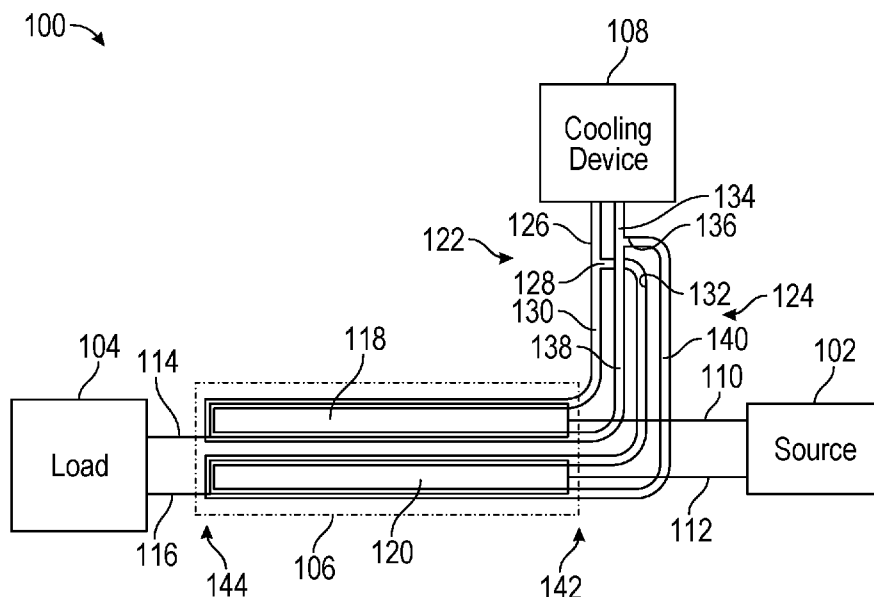


FIG. 1

(57) Abstract: A liquid cooled charging cable system may be provided. The liquid cooled charging cable system may comprise a source, a load, a liquid cooled charging cable, and a cooling device. The liquid cooled charging cable may connect the source to the load, and may supply electric energy from the source to the load. The liquid cooled charging cable may comprise a supply conductor and a return conductor. The cooling device may pump a coolant around the supply conductor and the return conductor where the supply conductor and the return conductor may be immersed in the coolant.

TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

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- *before the expiration of the time limit for amending the
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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2017/032859

A. CLASSIFICATION OF SUBJECT MATTER
 INV. H01B7/42 B60L11/18
 ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H01B B60L

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)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2015/217654 A1 (WOO YEE SHAN [US] ET AL) 6 August 2015 (2015-08-06) paragraph [0040] - paragraph [0041]; figures 8, 9	1,7
Y	US 2005/006116 A1 (REHRIG RICHARD B [US]) 13 January 2005 (2005-01-13) paragraph [0013] - paragraph [0014]; figures 2-4	1,7
A	FR 2 444 999 A1 (VOLVO AB [SE]) 18 July 1980 (1980-07-18) abstract; figures 1,2	1-12
A	US 6 100 467 A (KROULIK ERWIN K [US]) 8 August 2000 (2000-08-08) abstract; figures 1-5	1-12
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Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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"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

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Date of mailing of the international search report

29/11/2017

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2017/032859

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	DE 10 2015 120048 A1 (PORSCHE AG [DE]) 24 May 2017 (2017-05-24) the whole document	1-12
A	----- US 1 866 611 A (AFFEL HERMAN A) 12 July 1932 (1932-07-12) abstract; figure 1 -----	1-12

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/032859

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-12

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-12

Construction of a cable

The special technical feature is the space between the hose and the conductor

2. claims: 13-20

Construction of an output terminal tab having a fluid passway

The special technical feature is fluid passway through the terminal

3. claim: 21

A liquid cooled charging cable

The special technical feature is the immersion of the conductors in the coolant.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2017/032859

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