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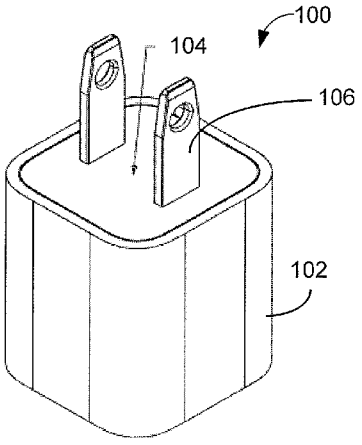
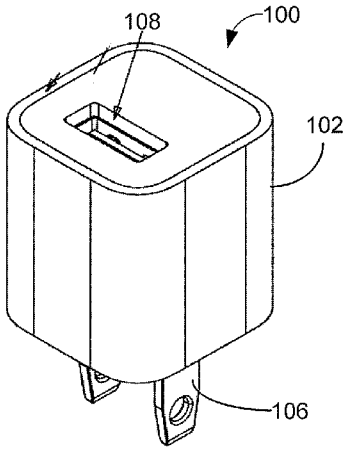
(54) Title: POWER ADAPTER WITH A SINGLE-PIECE INSULATOR ASSEMBLY





(57) Abstract: An AC-to-DC power adapter comprises a single-piece insulator unit. The various components of the power adapter such as a transformer, other circuitry, etc. are attached to the single-piece insulator unit. The single-piece insulator unit has embedded channels to provide electrical connectivity between the circuitry, The entire assembly is placed in housing and a cap assembly having prongs to connect to a AC wall outlet is ultrasonically welded to the housing.

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
INV. H01R13/66 H02M1/10
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)
H01R H02M

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FARIBORZ MUSAVI ET AL: "Energy efficiency in plug-in hybrid electric vehicle chargers: Evaluation and comparison of front end AC-DC topologies", ENERGY CONVERSION CONGRESS AND EXPOSITION (ECCE), 2011 IEEE, IEEE, 17 September 2011 (2011-09-17), pages 273-280, XP032067174, DOI: 10.1109/ECCE.2011.6063780 ISBN: 978-1-4577-0542-7 the whole document --- CN 101 552 541 A (UNIV XIAMEN [CN] UNIV XIAMEN; BLUE SKY INFORMATION TECHNOLOGY CO LTD) 7 October 2009 (2009-10-07) the whole document --- -/-	1-20
A		1-20

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
3 April 2013	09/04/2013

Name and mailing address of the ISA/	Authorized officer
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 01/08262 A2 (CHEN WALTER ROLAND [SG]) 1 February 2001 (2001-02-01) the whol e document -----	1-20
A	US 2008/315831 AI (LI PETER T [US] ET AL) 25 December 2008 (2008-12-25) the whol e document -----	1-20

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 101552541 A	07-10-2009	NONE	
WO 0108262 A2	01-02-2001	EP 1142087 A2	10-10-2001
		SG 122734 A1	29-06-2006
		WO 0108262 A2	01-02-2001
US 2008315831 A1	25-12-2008	CN 101345488 A	14-01-2009
		TW 200915700 A	01-04-2009
		US 2008315831 A1	25-12-2008