

Title (en)  
COUPLED CHEMICAL-THERMAL SOLAR POWER SYSTEM AND METHOD

Title (de)  
GEKOPPELTE CHEMISCH-THERMISCHE SOLARANLAGE UND VERFAHREN

Title (fr)  
SYSTÈME DE PRODUCTION D'ÉNERGIE SOLAIRE CHIMIQUE-THERMIQUE COUPLÉ ET PROCÉDÉ S'Y RAPPORTANT

Publication  
**EP 2909546 A4 20161116 (EN)**

Application  
**EP 13847674 A 20131010**

Priority  
• US 201261714377 P 20121016  
• US 2013064226 W 20131010

Abstract (en)  
[origin: WO2014062464A1] A CSP system is disclosed which couples a thermal and a chemical energy pathway. The thermal pathway utilizes a heat transfer fluid to collect concentrated sunlight as thermal energy at medium temperature and transfer this energy to a thermal-to-electric power cycle. In parallel, the chemical pathway uses a redox material which undergoes direct photoreduction in the receiver to store the solar energy as chemical potential. This redox material is then oxidized at very high temperatures in the power cycle in series with the thermal pathway heat exchanger. This coupling allows the receiver to perform at the high efficiencies typical of state of the art thermal power towers while simultaneously achieving the power cycle efficiencies typical of natural gas combustion plants and achieving a very high overall solar-to-electric conversion efficiency.

IPC 8 full level  
**F24J 1/00** (2006.01); **F24J 2/04** (2006.01); **F24J 2/34** (2006.01); **F24S 20/20** (2018.01); **F24S 23/70** (2018.01); **F24S 90/00** (2018.01); **F24V 30/00** (2018.01)

CPC (source: EP ES US)  
**F03G 6/06** (2013.01 - ES); **F24S 10/20** (2018.04 - EP ES US); **F24S 20/20** (2018.04 - EP ES US); **F24S 23/70** (2018.04 - US); **F24S 60/20** (2018.04 - EP US); **F24S 80/20** (2018.04 - EP ES US); **F24S 90/00** (2018.04 - EP US); **F24V 30/00** (2018.04 - EP ES US); **F28D 20/003** (2013.01 - EP ES US); **F28D 2020/0047** (2013.01 - EP US); **Y02E 10/40** (2013.01 - US); **Y02E 10/44** (2013.01 - EP US); **Y02E 10/46** (2013.01 - EP US); **Y02E 60/14** (2013.01 - EP US); **Y02E 70/30** (2013.01 - EP US)

Citation (search report)  
• [Y] DE 102010053902 A1 20120614 - DEUTSCH ZENTR LUFT & RAUMFAHRT [DE]  
• [Y] US 2010269817 A1 20101028 - KELLY EDMUND JOSEPH [US]  
• [Y] "Advances in Science and Technology, 5th Forum on New Materials, Part C", 18 June 2010, Italy, ISBN: 978-3-908158-57-8, article ANTON MEIER AND ALDO STEINFELD: "Solar Thermochemical Production of Fuels", pages: 303 - 312, XP002762283, DOI: 10:4028/www.scientific.net/AST.74.303  
• See references of WO 2014062464A1

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)  
**WO 2014062464 A1 20140424**; CL 2015000934 A1 20160328; CN 104884874 A 20150902; EP 2909546 A1 20150826; EP 2909546 A4 20161116; ES 2544002 A2 20150826; ES 2544002 B1 20161006; ES 2544002 R1 20151023; US 2015253039 A1 20150910; ZA 201501984 B 20160928

DOCDB simple family (application)  
**US 2013064226 W 20131010**; CL 2015000934 A 20150414; CN 201380053970 A 20131010; EP 13847674 A 20131010; ES 201590033 A 20131010; US 201314430036 A 20131010; ZA 201501984 A 20150323