

Title (en)

Thermoelectric energy storage system with regenerative heat exchange and method for storing thermoelectric energy

Title (de)

System zum Speichern von thermoelektrischer Energie mit regenerativem Wärmeaustausch und Verfahren zur Speicherung von thermoelektrischer Energie

Title (fr)

Système de stockage d'énergie thermoélectrique avec échange thermique régénératif et procédé de stockage d'énergie thermoélectrique

Publication

EP 2587005 A1 20130501 (EN)

Application

EP 11187317 A 20111031

Priority

EP 11187317 A 20111031

Abstract (en)

A thermoelectric energy storage (TEES) system having a charging cycle (10) for providing thermal energy to a hot thermal storage arrangement (18, 22, 24), and a discharging cycle (30) for generating electricity by retrieving the thermal energy from the hot thermal storage arrangement (18, 22, 24), the thermoelectric energy storage system including regenerative heat exchange. The system comprises a working fluid circuit adapted to circulate a gaseous working fluid through the hot thermal storage arrangement (18, 22, 24) and a cold thermal storage arrangement (14, 26, 28), wherein the hot thermal storage arrangement comprises a hot storage heat exchanger (18) and at least two hot storage tanks (22, 24) coupled via the hot storage heat exchanger (18). The cold thermal storage arrangement comprises a cold storage heat exchanger (14) and at least two cold storage tanks (26, 28) coupled via a cold storage heat exchanger (14). The system also provides a regenerative heat exchanger (20), adapted to further cool the working fluid at the output of the hot thermal storage arrangement during the charging cycle (10), and to pre-heat the working fluid at the input into the hot thermal storage arrangement during a discharging cycle (30). Notably, the working fluid is constantly in gas phase during the charging and discharging cycles.

IPC 8 full level

F01K 3/12 (2006.01); **F28D 20/00** (2006.01)

CPC (source: EP)

F01K 3/12 (2013.01)

Citation (applicant)

- EP 1577548 A1 20050921 - ABB RESEARCH LTD [CH]
- WO 2008148962 A2 20081211 - SAIPEM SA [FR], et al

Citation (search report)

- [YA] EP 2312129 A1 20110420 - ABB RESEARCH LTD [CH]
- [Y] US 4089744 A 19780516 - CAHN ROBERT P

Cited by

CN105794101A; EP2927435A1; CN114857973A; US9671175B2; WO2017210713A1; WO2014193724A1; WO2023206816A1; US9482117B2

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

Designated extension state (EPC)

BA ME

DOCDB simple family (publication)

EP 2587005 A1 20130501; WO 2013064317 A1 20130510; WO 2013064524 A1 20130510

DOCDB simple family (application)

EP 11187317 A 20111031; EP 2012069157 W 20120928; EP 2012071534 W 20121031