



- (51) **International Patent Classification:**
F28D 20/00 (2006.01) *F24H 4/04* (2006.01)
- (21) **International Application Number:**
PCT/SE2013/051283
- (22) **International Filing Date:**
1 November 2013 (01.11.2013)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
1251241-4 1 November 2012 (01.11.2012) SE
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- (81) **Designated States** (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

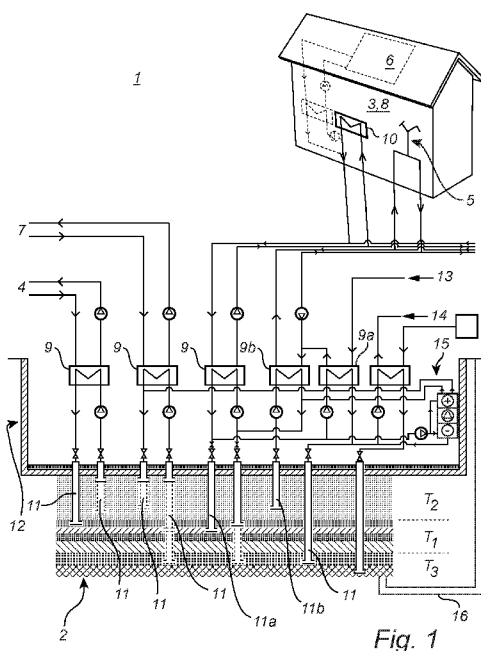
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, 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.

- (84) **Designated States** (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CL, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) **Title:** THERMAL ENERGY STORAGE SYSTEM COMPRISING A COMBINED HEATING AND COOLING MACHINE AND A METHOD FOR USING THE THERMAL ENERGY STORAGE SYSTEM



(57) **Abstract:** The present invention relates to a thermal energy storage system comprising an energy storage (2) having a vertical temperature gradient and an internal combined heating and cooling machine (15). The internal combined heating and cooling machine (15) is adapted for retrieving energy having a first temperature from the energy storage, while simultaneously returning heated energy having a second higher temperature and cooled energy having a third lower temperature. The invention also relates to a method for using the thermal energy storage system.