

Title (en)
METHOD AND DEVICE FOR CONVERTING THERMAL ENERGY

Title (de)
VERFAHREN UND VORRICHTUNG ZUR UMWANDLUNG THERMISCHER ENERGIE

Title (fr)
PROCÉDÉ ET DISPOSITIF DE CONVERSION D'ÉNERGIE THERMIQUE

Publication
EP 3814611 C0 20230809 (FR)

Application
EP 19744766 A 20190625

Priority
• FR 1855910 A 20180628
• FR 2019051550 W 20190625

Abstract (en)
[origin: WO2020002818A1] The invention particularly concerns an improved method for converting thermal energy into mechanical energy, and then, preferably, into electricity and/or into refrigerating energy. The desired improvement consists, in particular, in improving the energy efficiency. In order to achieve this, at least one at least partially liquid stream fc0 of fluid FC is implemented; thermal energy to be converted is transferred to the stream fc0; the heated stream fc0 is sprayed in order to generate a fragmented stream fc1 of fluid FC. At the same time, at least one generally at least partially liquid stream ft0 of fluid FT is implemented; thermal energy to be converted is transferred to the stream ft0 of fluid FT in order to generate at least one stream ft that may be in liquid form or in the form of a saturated liquid/vapour mixture, the vapour title of which can vary from 0% to 100%, or indeed in the form of superheated vapour; the stream f1 is expanded in at least one chamber also receiving the fragmented stream fc1 of fluid FC, in order to form a two-phase mixed stream fc1/t; the kinetic energy of this accelerated stream fc1/t is then converted into mechanical energy; the latter optionally being transformed into electrical energy, or indeed into refrigerating energy; FT and FC are separated; an at least partially gaseous stream ft00 of FT and an at least partially liquid stream fc0 of FC are recovered; the stream fc0 of FC is compressed and its circulation speed is increased; the at least partially gaseous stream f100 of FT is condensed into an at least partially liquid stream ft0 of FT; the stream ft00 of FT is compressed and its circulation speed is increased. The invention also relates to a device for implementing this method.

IPC 8 full level
F01K 9/00 (2006.01); **F01K 21/00** (2006.01); **F01K 25/04** (2006.01); **F01K 25/06** (2006.01)

CPC (source: EP US)
F01K 1/00 (2013.01 - US); **F01K 3/186** (2013.01 - US); **F01K 21/005** (2013.01 - EP US); **F01K 25/04** (2013.01 - EP US);
F01K 25/065 (2013.01 - EP US); **F22B 1/006** (2013.01 - US)

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

Participating member state (EPC – UP)
AT BE BG DE DK EE FI FR IT LT LU LV MT NL PT SE SI

DOCDB simple family (publication)
WO 2020002818 A1 20200102; AU 2019292987 A1 20210121; AU 2019292987 B2 20240718; BR 112020026709 A2 20210413;
CA 3104864 A1 20200102; EP 3814611 A1 20210505; EP 3814611 B1 20230809; EP 3814611 C0 20230809; FR 3083261 A1 20200103;
FR 3083261 B1 20220520; US 11891922 B2 20240206; US 2021222590 A1 20210722

DOCDB simple family (application)
FR 2019051550 W 20190625; AU 2019292987 A 20190625; BR 112020026709 A 20190625; CA 3104864 A 20190625;
EP 19744766 A 20190625; FR 1855910 A 20180628; US 201917255997 A 20190625