

Title (en)  
HEAT AND ENERGY EXCHANGE

Title (de)  
WÄRME- UND ENERGIEAUSTAUSCH

Title (fr)  
ÉCHANGE DE CHALEUR ET D'ÉNERGIE

Publication  
**EP 2577210 A1 20130410 (EN)**

Application  
**EP 11722698 A 20110520**

Priority  

- US 34744610 P 20100523
- US 2011037369 W 20110520

Abstract (en)  
[origin: WO2011149780A1] Materials, components, and methods are provided that are directed to the fabrication and use of micro-scale channels with a fluid for a heat exchange system, where the temperature and flow of the fluid is controlled, in part, through the macroscopic geometry of the micro-scale channel and the configuration of at least a portion of the wall of the micro-scale channel and the constituent particles that make up the fluid. Moreover, the wall of the micro-scale channel and the constituent particles are configured such that collisions between the constituent particles and the wall are substantially specular. Accelerating and decelerating elements provided herein can be configured with micro-scale channels which can trace out a generally spiral path.

IPC 8 full level  
**F28D 15/00** (2006.01); **H01L 23/34** (2006.01)

CPC (source: EP US)  
**F28D 15/00** (2013.01 - EP US); **F28F 1/00** (2013.01 - US); **F28F 13/18** (2013.01 - US); **F28D 2015/0225** (2013.01 - EP US);  
**F28F 2260/02** (2013.01 - EP US)

Citation (search report)  
See references of WO 2011149780A1

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)  
**WO 2011149780 A1 20111201**; AU 2011258652 A1 20121220; AU 2011258652 A2 20130110; BR 112012029534 A2 20161206;  
BR 112012029534 B1 20210302; BR 112012029534 B8 20220830; CA 2800209 A1 20111201; CN 102985781 A 20130320;  
CN 102985781 B 20160302; EP 2577210 A1 20130410; IL 223148 A0 20130203; JP 2013528275 A 20130708; RU 2012153238 A 20140627;  
RU 2566874 C2 20151027; SG 185705 A1 20130130; US 2013153182 A1 20130620

DOCDB simple family (application)  
**US 2011037369 W 20110520**; AU 2011258652 A 20110520; BR 112012029534 A 20110520; CA 2800209 A 20110520;  
CN 201180034467 A 20110520; EP 11722698 A 20110520; IL 22314812 A 20121120; JP 2013512098 A 20110520;  
RU 2012153238 A 20110520; SG 2012085940 A 20110520; US 201113699461 A 20110520