

## Title (en)

Heat exchange surface with galvanized microstructures with protrusions

## Title (de)

Wärmeübertragungsfläche mit einer aufgalvanisierten Mikrostruktur von Vorsprüngen

## Title (fr)

Surface d'échange de chaleur avec microstructures galvanisées avec des protubérances

## Publication

**EP 1318371 A3 20050713 (DE)**

## Application

**EP 02027031 A 20021203**

## Priority

DE 10159860 A 20011206

## Abstract (en)

[origin: EP1318371A2] The heat transfer surface (3), on a plate or tube body (4), has a galvanized projecting micro-structure extending from the base surface (3a) with a minimum height of 10  $\mu$ m. The base surface is covered with projections (6), wholly or partially, as pin-shaped micro-structures. The longitudinal axes (6c) of the micro-pins are either at right angles to the surface or they are pitched at an angle of 30-90 degrees to the surface. The micro-pins have a thickness (d) of 0.2-100.0  $\mu$ m, with a pin density of  $10^{2-10^{8}}$  per  $\text{cm}^2$ . The structures are galvanized on to the surface using a polymer membrane with micro-pores.

## IPC 1-7

**F28F 13/18**

## IPC 8 full level

**C25D 5/02** (2006.01); **C25D 7/00** (2006.01); **F28F 1/12** (2006.01); **F28F 13/18** (2006.01)

## CPC (source: EP US)

**C25D 5/022** (2013.01 - EP US); **C25D 7/00** (2013.01 - EP US); **F28F 1/124** (2013.01 - EP US); **F28F 13/187** (2013.01 - EP US); **Y10S 165/905** (2013.01 - EP US)

## Citation (search report)

- [XY] US 6197180 B1 20010306 - KELLY KEVIN W [US]
- [Y] DE 19650881 A1 19980610 - SCHWERIONENFORSCH GMBH [DE]
- [X] US 3842474 A 19741022 - SCHLADITZ H
- [A] DE 10021489 A1 20010607 - LIN CHING BIN [TW], et al
- [A] EP 1041407 A1 20001004 - CANON KK [JP]
- [A] PATENT ABSTRACTS OF JAPAN vol. 009, no. 206 (M - 406) 23 August 1985 (1985-08-23)
- [A] PATENT ABSTRACTS OF JAPAN vol. 008, no. 160 (M - 312) 25 July 1984 (1984-07-25)

## Cited by

EP2727679A1; EP2260996A1; DE102008030423B4; FR2950134A1; FR2950133A1; EP2423475A3; EP3059541A4; WO2011029918A1; WO2011029917A1; WO2009071501A1; DE102013018203A1

## Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LU MC NL PT SE SI SK TR

## DOCDB simple family (publication)

**EP 1318371 A2 20030611**; **EP 1318371 A3 20050713**; **EP 1318371 B1 20080116**; AT E384237 T1 20080215; DE 10159860 A1 20030724; DE 10159860 C2 20031204; DE 50211546 D1 20080306; ES 2300414 T3 20080616; PT 1318371 E 20080422; US 2003136547 A1 20030724; US 6736204 B2 20040518

## DOCDB simple family (application)

**EP 02027031 A 20021203**; AT 02027031 T 20021203; DE 10159860 A 20011206; DE 50211546 T 20021203; ES 02027031 T 20021203; PT 02027031 T 20021203; US 30556902 A 20021127