

Title (en)  
Apparatus and process for heat transfer.

Title (de)  
Vorrichtung und Verfahren zur Wärmeübertragung.

Title (fr)  
Dispositif et procédé de transfert de chaleur.

Publication  
**EP 0042613 A2 19811230 (EN)**

Application  
**EP 81104809 A 19810622**

Priority  
US 16241480 A 19800624

Abstract (en)  
Apparatus and a process of heat transfer employ a fluid flow passage in which the flow consist of non-turbulent boundary-layers adjacent the surfaces and a non-turbulent core-layer between the boundary-layers and interfacing therewith. An interrupter-structure is disposed within the flow passage and interrupts the full development of the boundary-layers at a multitude of spaced spots, leaving the heat transfer surfaces unaltered, unmodified and uninterrupted, so that the boundary-layers cannot increase in thickness but will partially separate from the surfaces and mix non-turbulently with the core-layer to effect the required heat transfer between the walls and the fluid. The interrupter-structure preferably consists of a plurality of spheres, or a sheet in which spherical, elliptical, drop-shaped or egg-shaped protrusions have been formed, all of which can be obtained readily on the market place at very low cost. This is to be contrasted with prior art apparatus which increase the heat exchange by rendering the fluid turbulent e.g. by turbulence promoters or roughening, ridging or interrupting the heat transfer walls. The increased turbulence increases heat transfer but produces a proportionally much greater increase in pumping power that makes these proposals uneconomic for many applications.

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IPC 8 full level  
**F15D 1/06** (2006.01); **F28F 13/00** (2006.01); **F28F 13/02** (2006.01)

CPC (source: EP)  
**F15D 1/06** (2013.01); **F28F 13/003** (2013.01); **F28F 13/02** (2013.01)

Cited by  
US4670103A; US4964459A; CN113899236A; EP0124584A4; US4784218A; EP0065679A1; CN112728990A; EP0679812A4; CN113899237A; US4960167A; EP0160662A4; AU625672B2; EP2566656A4; WO0187477A1; WO8806706A1; WO9608677A1; WO8806707A1; WO9608658A1

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