

Title (en)
RECOVERY OF HEAT FROM FLUE GASES

Publication
EP 0351247 A3 19900425 (EN)

Application
EP 89307197 A 19890714

Priority
CA 572208 A 19880715

Abstract (en)
[origin: EP0351247A2] Heat exchange apparatus comprising at least two adjacent rows of tubes (an inner and an outer row) or at least two spaced rings of helical coils (30) (an inner ring and an outer ring) for the transfer of heat thereinto from gases passing through the heat exchange apparatus wherein the tubes of the inner row are, or the inner ring of coils (30B) is staggered with respect to the tubes of the outer row or coils of the outer ring (30A) and the inner row or ring (30B) is spaced from the outer (30A) by such amount to block the flow of gases and prevent streaming of the gases to maximize turbulence of the gases passing thereby, thereby enhancing heat transfer from the gases to the tubes or coils (30). In another embodiment the spacing between the adjacent tubes of the outer row and adjacent coils (30) of the outer ring (30A) was a distance equal to the distance calculated by multiplying a factor of .500/.875 or about .571 (.5714) by the outside diameter (D) of the coil (30) or tube of the adjacent inner coil (30b) or tube and which adjacent coils (30) or tubes of the inner row or coil (30B) is centrally placed in the space between tubes or coils (30) of the outer row or ring (30A) of helical coils (30) wherein the spacing of the inner row of tubes or inner ring (30B) is spaced from the outer row or outer ring (30A) by a distance calculated by multiplying a factor of about 1.250/.875 or 1.429 (1.4286) by the outer diameter (D) of the inner row of coils (30B) or the inner ring respectively.

IPC 1-7
F28D 7/02; **F28D 21/00**; **F28F 13/06**

IPC 8 full level
F28D 7/02 (2006.01); **F28F 9/013** (2006.01)

CPC (source: EP)
F28D 7/024 (2013.01); **F28D 21/0007** (2013.01); **F28F 9/0131** (2013.01); **F28F 9/22** (2013.01); **F28F 9/26** (2013.01)

Citation (search report)
• US 4512288 A 19850423 - MICHAUD ROGER [CA]
• US 3403727 A 19681001 - RUDOLF BECKER
• FR 2476804 A1 19810828 - SAGEOT JEAN CLAUDE [FR]
• GB 2119074 A 19831109 - STEINECKER MASCHF GMBH
• GB 461210 A 19370212 - BOLIDENS GRUV AB
• CH 435347 A 19670515 - WAAGNER BIRO AG [AT]
• GB 1163804 A 19690910 - RICHMOND ENGINEERING COMPANY I [US]
• US 4210203 A 19800701 - MARGEN PETER H E [SE], et al
• US 2830798 A 19580415 - ANDERSEN SOREN K

Cited by
WO2021144682A1; CN110595229A; CN112128969A; EP2189745A1; ITTV20080151A1; EP0440886A1; EP2946161A4; CN113999058A; FR3018332A1; RU2674834C2; FR2958735A1; CN103080688A; AU2011256963B2; EP3165862A1; CN115235287A; US10012413B2; WO0155661A1; WO03040641A1; WO2011148178A3; US11384998B2; WO2015132522A1; US9127580B2; US9551256B2; US10247487B2

Designated contracting state (EPC)
DE ES FR GB IT NL

DOCDB simple family (publication)
EP 0351247 A2 19900117; **EP 0351247 A3 19900425**

DOCDB simple family (application)
EP 89307197 A 19890714