

Title (en)  
TUBE CLEANERS FOR CLEANING THE INSIDE OF A TUBE

Publication  
**EP 0220347 B1 19911227 (EN)**

Application  
**EP 85307586 A 19851021**

Priority  
US 55476583 A 19831123

Abstract (en)  
[origin: EP0220347A1] Recirculating tube cleaners (2) pass through inside diameters in a bank of heat exchanger tubes (3). Variable density tube cleaners are provided which are pressurized to compress and have a substantially neutral buoyancy upon entry from an inlet manifold (12) to the inside diameter of the tubes. Upon exiting from a heat exchanger outlet manifold (13) the tube cleaners return to either positive or negative buoyancy depending upon the embodiment. Skimmer means (25) intercept tube cleaners having positive buoyancy from the upper portion of flow and direct them to a recirculation system (6). Open cell elastomer tube cleaners having negative buoyancy may be intercepted at the bottom of the flow and then partially dewatered for adjustment toward neutral buoyancy. As contrasted to prior art embodiments in which the entire outlet flow must be screened, here only a small percentage, for example one percent of the outlet flow, need be intercepted. The tube cleaners are re-entrained in a pumped stream and reintroduced for circulation through the tube bank under pressure. The tube cleaners are made to have a density such that they approach neutral buoyancy for equal distribution through upper and lower tubes. A tube cleaner may be formed of two components, a cleaning component and a buoyancy component. Variation in density in response to pressure may be limited.

IPC 1-7  
**F28G 1/12**

IPC 8 full level  
**B08B 9/032** (2006.01); **B08B 9/04** (2006.01); **F28G 1/12** (2006.01)

CPC (source: EP)  
**B08B 9/055** (2013.01); **B08B 9/057** (2013.01); **F28G 1/12** (2013.01)

Cited by  
CN111495894A; EP0767010A1; EP2070606A1; EP2285502A4; CN103189709A; EP0487488A3; GB2207972A; DE3803045A1; FR2618698A1; GB2207972B; US10030920B2; US9670586B1; US9182183B2; WO2013006873A1; WO2015057163A1; WO2012044249A1

Designated contracting state (EPC)  
AT CH DE LI NL SE

DOCDB simple family (publication)  
**EP 0220347 A1 19870506; EP 0220347 B1 19911227**; FR 2589090 A1 19870430; GB 2181810 A 19870429; GB 2181810 B 19900613; GB 8525897 D0 19851127

DOCDB simple family (application)  
**EP 85307586 A 19851021**; FR 8515955 A 19851028; GB 8525897 A 19851021