

Title (en)  
COOLING DEVICE

Title (de)  
KÜHLVORRICHTUNG

Title (fr)  
DISPOSITIF DE REFROIDISSEMENT

Publication  
**EP 3391977 A4 20190123 (EN)**

Application  
**EP 15910802 A 20151221**

Priority  
• KR 20150181265 A 20151217  
• KR 2015013995 W 20151221

Abstract (en)  
[origin: EP3391977A1] An exemplary embodiment of the present invention provides a cooling device including: a tub which is disposed above a cooling target and has an accommodation space that accommodates a coolant supplied from the outside; and spray nozzles which are installed in the accommodation space, each of the spray nozzles having one or more coolant inlet ports into which the coolant flows, the spray nozzles being disposed to be spaced apart from a central portion of the accommodation space toward an edge portion of the accommodation space, and the spray nozzles spraying the coolant, which flows in through the coolant inlet port, toward the cooling target, in which heights of the coolant inlet ports are in proportion to distances at which the spray nozzles are spaced apart from the central portion of the accommodation space.

IPC 8 full level  
**B21B 45/02** (2006.01)

CPC (source: EP US)  
**B21B 45/0218** (2013.01 - EP US); **B21B 45/0233** (2013.01 - EP US); **B21B 2261/21** (2013.01 - EP US); **B21B 2263/06** (2013.01 - EP US)

Citation (search report)  
• [A] WO 2006019221 A1 20060223 - POSCO [KR], et al  
• [A] EP 1157755 A2 20011128 - SMS DEMAG AG [DE]  
• [A] JP 2000051921 A 20000222 - NIPPON KOKAN KK  
• See references of WO 2017104881A1

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)  
**EP 3391977 A1 20181024**; **EP 3391977 A4 20190123**; CN 108633264 A 20181009; CN 108633264 B 20200407; JP 2018538144 A 20181227; KR 101726763 B1 20170413; US 2019084021 A1 20190321; WO 2017104881 A1 20170622

DOCDB simple family (application)  
**EP 15910802 A 20151221**; CN 201580085790 A 20151221; JP 2018531109 A 20151221; KR 2015013995 W 20151221; KR 20150181265 A 20151217; US 201516063638 A 20151221