

Title (en)

PUMP BLADE FOR SUBMERGED PUMP AND SUBMERGED PUMP HAVING SAME

Title (de)

PUMPENKLINGE FÜR EINE UNTERWASSERPUMPE UND TAUCHPUMPE DAMIT

Title (fr)

AILETTE DE POMPE POUR POMPE IMMERGÉE ET POMPE IMMERGÉE COMPRENANT CELLE-CI

Publication

EP 2930367 B1 20200527 (EN)

Application

EP 14819908 A 20140415

Priority

- JP 2013141415 A 20130705
- JP 2014060657 W 20140415

Abstract (en)

[origin: EP2930367A1] A pump impeller for a submerged pump capable of removing or reducing the radial load is provided. A non-clogging submerged pump is provided, which includes a substantially cylindrical body, an intake port provided in a center of a lower end surface of the body, a discharge port that is open in a side surface of the body, and a flow channel passing from the intake port to the discharge port within the body. The flow channel includes a plurality of flow channels, and the flow channels have their size, shape, and position defined such that fluid unbalance is reduced with respect to an axis of rotation.

IPC 8 full level

F04D 7/04 (2006.01); **F04D 13/02** (2006.01); **F04D 29/22** (2006.01); **F04D 29/66** (2006.01)

CPC (source: CN EP US)

F04D 7/04 (2013.01 - CN EP US); **F04D 13/02** (2013.01 - US); **F04D 29/225** (2013.01 - CN EP US); **F04D 29/2255** (2013.01 - CN EP US); **F04D 29/426** (2013.01 - US); **F04D 29/669** (2013.01 - EP US)

Citation (examination)

- DE 3211230 A1 19830929 - PLEIGER MASCHF PAUL [DE]
- US 2010272563 A1 20101028 - CHIOVELLI STEFANO [CA]
- US 1975274 A 19341002 - ALADAR HOLLANDER, et al
- WO 2012115452 A2 20120830 - LEE JEA WOONG [KR]

Citation (opposition)

Opponent : Grundfos Holding A/S

- JP 2013141415 A 20130722 - IHI CORP, et al
 - WO 2015001830 A1 20150108 - EBARA CORP [JP]
 - WO 2012115452 A2 20120830 - LEE JEA WOONG [KR]
 - US 1975274 A 19341002 - ALADAR HOLLANDER, et al
 - EP 1258635 B1 20060531 - GRUNDFOS MANAGEMENT AS [DK]
 - US 6837684 B2 20050104 - ILVES LASSE [FI]
 - EP 1795758 A1 20070613 - GRUNDFOS MANAGEMENT AS [DK]
 - JP H09209963 A 19970812 - NAKASE NORIYUKI, et al
 - US 4981417 A 19910101 - ARBEUS ULF [SE]
 - US 6405748 B1 20020618 - MUHS DAVID [US], et al
 - US 2010272563 A1 20101028 - CHIOVELLI STEFANO [CA]
 - MX 2007002934 A 20080917 - CALIDAD EMPRESARIAL DINAMICA SA DE CV [MX]
 - WO 2011117801 A2 20110929 - FUNDACJA ROZWOJU KARDIOCHIRURGII IM PROF ZBIGNIEWA RELIGI [PL], et al
 - JP 2000297789 A 20001024 - TOKYO ELECTRIC POWER CO, et al
 - EP 2930367 B1 20200527 - EBARA CORP [JP]
 - JP 2013141415 A 20130722 - IHI CORP, et al
 - WO 2015001830 A1 20150108 - EBARA CORP [JP]
 - WO 2012115452 A2 20120830 - LEE JEA WOONG [KR]
 - US 1975274 A 19341002 - ALADAR HOLLANDER, et al
 - EP 1258635 B1 20060531 - GRUNDFOS MANAGEMENT AS [DK]
 - US 6837684 B2 20050104 - ILVES LASSE [FI]
 - EP 1795758 A1 20070613 - GRUNDFOS MANAGEMENT AS [DK]
 - JP H09209963 A 19970812 - NAKASE NORIYUKI, et al
 - US 4981417 A 19910101 - ARBEUS ULF [SE]
 - US 6405748 B1 20020618 - MUHS DAVID [US], et al
 - US 2010272563 A1 20101028 - CHIOVELLI STEFANO [CA]
 - MX 2007002934 A 20080917 - CALIDAD EMPRESARIAL DINAMICA SA DE CV [MX]
 - WO 2011117801 A2 20110929 - FUNDACJA ROZWOJU KARDIOCHIRURGII IM PROF ZBIGNIEWA RELIGI [PL], et al
 - JP 2000297789 A 20001024 - TOKYO ELECTRIC POWER CO, et al
 - EP 14819908 A 20140415
 - B.S. NARASIMHA MURTHY ET AL.: "Influence of Surface Roughness on the Performance of a Radial Pump Impeller", 6TH AUSTRALIAN HYDRAULICS AND FLUID MECHANICS CONFERENCE ADELAIDE, AUSTRALIA, 5 December 1977 (1977-12-05) - 9 December 1977 (1977-12-09), pages 391 - 394, XP055790665
 - B.S. NARASIMHA MURTHY ET AL.: "Influence of Surface Roughness on the Performance of a Radial Pump Impeller", 6TH AUSTRALIAN HYDRAULICS AND FLUID MECHANICS CONFERENCE ADELAIDE, 5 December 1977 (1977-12-05), Australia, XP055790665
- Opponent : KSB SE & Co. KGaA
- EP 1258635 B1 20060531 - GRUNDFOS MANAGEMENT AS [DK]
 - JP H09209963 A 19970812 - NAKASE NORIYUKI, et al
 - US 4981417 A 19910101 - ARBEUS ULF [SE]
 - US 8535000 B2 20130917 - CHIOVELLI STEFANO [CA]

Cited by

WO2021049925A1; EP2930367B1

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

DOCDB simple family (publication)

EP 2930367 A1 20151014; EP 2930367 A4 20161102; EP 2930367 B1 20200527; BR 112015009797 A2 20170711;
BR 112015009797 A8 20170801; BR 112015009797 B1 20220315; CN 104662302 A 20150527; CN 104662302 B 20171128;
DK 2930367 T3 20200629; JP 2015014251 A 20150122; JP 6351216 B2 20180704; US 2016108927 A1 20160421;
WO 2015001830 A1 20150108

DOCDB simple family (application)

EP 14819908 A 20140415; BR 112015009797 A 20140415; CN 201480002515 A 20140415; DK 14819908 T 20140415;
JP 2013141415 A 20130705; JP 2014060657 W 20140415; US 201414439879 A 20140415