

## 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
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  - 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]
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  - US 8535000 B2 20130917 - CHIOVELLI STEFANO [CA]

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DOCDB simple family (publication)

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DK 2930367 T3 20200629; JP 2015014251 A 20150122; JP 6351216 B2 20180704; US 2016108927 A1 20160421;  
WO 2015001830 A1 20150108

DOCDB simple family (application)

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