

Title (en)

Device for pumping or compressing a multi-phase fluid comprising tandem blading

Title (de)

Pumpe oder Verdichter zum Pumpen einer mehrphasigen Flüssigkeit

Title (fr)

Dispositif de pompage ou de compression d'un fluide polyphasique à aubage en tandem

Publication

**EP 0781929 A1 19970702 (FR)**

Application

**EP 96402879 A 19961224**

Priority

FR 9515624 A 19951228

Abstract (en)

The pumping system comprises a hollow casing having an inlet orifice and a fluid outlet orifice. A rotor rotates inside the casing. The rotor comprises a hub with a blade (Gj) fixed to the hub. The blade has a first (A1j) and second (A2j) blades each having a leading edge (aij) and a trailing edge (fij). The angle making tangent to the curve of the outline leaving from the leading edge to one of the first or second blades relative to the peripheral or tangential direction of the system is between 0 and 45 degrees. The relative positioning of the different groups of blades is determined from a parameter chosen from four parameters. The tangential gap (h) relative to the pitch (t) expressed as the ratio h/t is between 0.60 and 0.8. The ratio of the axial overlap rj to the total chord CTj corresponding to a group of blades Gj is between -0.01 and 0.05. The chord ratio CFj/CRj is between 0.5 and 1.5. The curvature ratio of the first blade to the second blade is between 0.1 and 1.0.

Abstract (fr)

Dispositif de compression ou de pompage d'un fluide polyphasique comportant au moins un groupe d'aubes (Gj) comprenant par exemple une première aube (A1j) et une seconde aube (A2j) de type tandem, dont les caractéristiques géométriques sont déterminées pour optimiser la compression ou le pompage d'un fluide polyphasique comprenant au moins une phase liquide et au moins une phase gazeuse. <IMAGE>

IPC 1-7

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IPC 8 full level

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Citation (applicant)

- FR 2157437 A5 19730601 - ROLLS ROYCE
- FR 2333139 A1 19770624 - INST FRANCAIS DU PETROLE [FR]
- FR 2471501 A1 19810619 - INST FRANCAIS DU PETROLE [FR]
- FR 2665224 A1 19920131 - INST FRANCAIS DU PETROLE [FR]
- "Optimization for Rotor Blades of Tandem Design for Axial Flow Compressors.", JOURNAL OF ENGINEERING FOR POWER., vol. 102, April 1980 (1980-04-01), pages 369

Citation (search report)

- [XA] GB 2168764 A 19860625 - ROLLS ROYCE
- [XA] FR 1404875 A 19650702 - THOMPSON RAMO WOOLDRIDGE INC
- [XY] EP 0348342 A1 19891227 - SULZER AG [CH]
- [Y] GB 630747 A 19491020 - GEORGE STANLEY TAYLOR
- [Y] GB 2193533 A 19880210 - NUOVO PIGNONE SPA
- [YA] US 2576700 A 19511127 - HEINRICH SCHNEIDER
- [A] US 3918841 A 19751111 - KIDA KAZUO, et al
- [A] FR 982027 A 19510604
- [A] WO 8904644 A1 19890601 - NIMBUS MEDICAL INC [US]
- [A] DE 1931527 A1 19700108 - RYLEWSKI EUGENIUSZ
- [A] GB 622415 A 19490502 - JAKOB KNUDSEN JAKOBSEN
- [A] GB 479427 A 19380131 - GYOERGY JENDRASSIK
- [AD] FR 2471501 A1 19810619 - INST FRANCAIS DU PETROLE [FR]
- [AD] FR 2665224 A1 19920131 - INST FRANCAIS DU PETROLE [FR]
- [AD] FR 2333139 A1 19770624 - INST FRANCAIS DU PETROLE [FR]
- [AD] FR 2157437 A5 19730601 - ROLLS ROYCE
- [AD] K. BAMMERT: "Optimization for Rotor Blades of Tandem Design for Axial Flow Compressors", JOURNAL OF ENGINEERING OF POWER, vol. 102, April 1980 (1980-04-01), pages 369 - 375, XP000618365

Cited by

CN104389810A; FR2787836A1; FR2787837A1; EP0917905A1; FR2771024A1; US6305911B2; EP2078824A1; FR2926322A1; US6273672B1; US6382919B1; US6210126B1; US8021113B2

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JP 3497 A 19970106; NO 965610 A 19961227; US 22114498 A 19981228; US 77706596 A 19961230