

Title (en)
METHOD FOR DELIVERING FLUIDS USING CENTRIFUGAL PUMPS

Title (de)
VERFAHREN ZUR FÖRDERUNG VON FLUIDEN MIT KREISELPUMPEN

Title (fr)
DISPOSITIF DE TRANSPORT DE FLUIDES PAR DES POMPES CENTRIFUGES

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Abstract (en)
[origin: WO2011000761A1] The invention relates to a method for delivering fluids using centrifugal pumps (11). Machines (1, 6) and/or apparatuses (3, 8), which influence the pressure and/or the temperature of the fluid, are disposed upstream of a centrifugal pump (11). At the inlet to the centrifugal pump (11), the fluid is regulated to achieve a specific entry state. According to the invention, the entry state of the fluid is regulated by means of the machines (1, 6) and/or apparatuses (3, 8) such that, in the centrifugal pump (11), the fluid only takes on states in which the compressibility factor of the fluid has already reached or exceeded the minimum thereof.

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Opponent : Air Liquide
• WO 2009106160 A1 20090903 - SIEMENS AG [DE], et al
• WO 9941490 A1 19990819 - CLEAN ENERGY SYSTEMS INC [US], et al
• US 4498289 A 19850212 - OSGERBY IAN [US]
• VOLKER MÜLLER: "ACD introduces its CO2 centrifugal pump to the American market", FROSTBYTE, vol. 9, no. 3, 1998, pages 1, XP055471662
• ISALSKI: "Séparation of Gases", 1989, article "9.4 Pumps", pages: 248 - 253, XP055471720
• VETTER ET AL.: "Ullmann's Encyclopedia", 2000, WILEY, article "High Pressure Technology", pages: 1 - 40, XP055097188
• GOUQ-JEN SU: "Modified Law of Corresponding States for Real Gases", INDUSTRIAL AND ENGINEERING CHEMISTRY, vol. 38, no. 8, 1 August 1946 (1946-08-01), pages 803 - 806, XP007914075

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