

Title (en)  
Method and device for driving a micropump

Title (de)  
Verfahren und Vorrichtung zur Ansteuerung einer Mikropumpe

Title (fr)  
Procédé et dispositif pour commander une micropompe

Publication  
**EP 0703364 A1 19960327 (DE)**

Application  
**EP 95112161 A 19950802**

Priority  
DE 4433894 A 19940922

Abstract (en)  
The control system is used for a micro-membrane pump(100) which has a feed direction defined by its valve structure(118,120), with selective reversal of the feed direction when a driver signal with a given energising frequency is supplied to the pump. The energising frequency is in a frequency range above the resonance frequency of the resonating system provided by the moving parts (106,118,120) of the pump and the pumped fluid, with a phase difference of between 90 and 180 degrees between the driver signal and the deflection of the valve structure.

Abstract (de)  
Eine Mikropumpe (100) hat eine durch ihre Ventilstruktur (118, 120) definierte Förderrichtung. Die durch die Ventilstruktur (118, 120) definierte Förderrichtung wird wahlweise umkehrt, indem ein Treibersignal mit einer Erregerfrequenz an die Mikropumpe (100) angelegt wird, welche im Bereich oberhalb einer Resonanz eines aus den beweglichen Teilen (106, 118, 120) der Mikropumpe (100) und dem zu pumpenden Fluid gebildeten Systems liegt. <IMAGE>

IPC 1-7  
**F04B 19/00**; **F04B 43/04**

IPC 8 full level  
**F04B 19/00** (2006.01); **F04B 43/04** (2006.01)

CPC (source: EP US)  
**F04B 19/006** (2013.01 - EP); **F04B 43/043** (2013.01 - EP US); **F04B 2203/0404** (2013.01 - EP)

Citation (applicant)  
WO 9305295 A1 19930318 - FRAUNHOFER GES FORSCHUNG [DE]

Citation (search report)  
• [AD] WO 9305295 A1 19930318 - FRAUNHOFER GES FORSCHUNG [DE]  
• [A] US 4344743 A 19820817 - BESSMAN SAMUEL P, et al  
• [A] ZENGERLE R: "a micro membrane pump with electrostatic actuation", 4 February 1992, IEEE, TRAVEMÜNDE (DE)  
• [A] PATENT ABSTRACTS OF JAPAN vol. 15, no. 497 (M - 1192) 16 December 1991 (1991-12-16)

Cited by  
JP2010151717A; EP0844395A3; DE19837434C2; EP1557565A3; EP1195523A3; US6395638B1; EP1065378A3; EP2027923A1; US7192629B2; US9623413B2; WO2021014444A1; WO2022162651A1; WO0101025A3; WO9851929A1; US7583853B2; US6951632B2; US9643178B2; US7144616B1; US7695683B2; US7291512B2; WO2020064060A1; US7217367B2; US11022470B2; WO9937400A1; WO9851928A1; US7459022B2; US7258774B2; US7927422B2; US8992858B2; US7368163B2; US7195670B2; US6261066B1; US9932687B2; US7407799B2; US7244402B2; US6599477B1; US8017353B2; US9868978B2; US7216671B2; US6899137B2; US7754010B2; US7766055B2; US8104497B2; US8656958B2; US7217321B2; US7097809B2; US9725764B2; US9957561B2; US10208341B2; US10214774B2; US10328428B2; US10940473B2; US7279146B2; US7326296B2; US6408878B2; US6793753B2; US7040338B2; US7169314B2; US9926521B2; US7494555B2; US7250128B2; US7306672B2; US6929030B2; US7704322B2; US9643136B2; US9657344B2; US10509018B2; US7143785B2; US7232109B2; US7294503B2; US6416294B1; US8252539B2; US9714443B2; US10131934B2

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