

Title (en)

Method and apparatus for transporting magnetic or magnetisable microbeads

Title (de)

Verfahren und Vorrichtung zum Transport magnetischer oder magnetisierbarer Mikrokugeln

Title (fr)

Procédé et appareil pour transporter des microbilles magnétiques ou magnétisables

Publication

**EP 1974821 A1 20081001 (EN)**

Application

**EP 07006148 A 20070326**

Priority

EP 07006148 A 20070326

Abstract (en)

A method and an apparatus for transporting magnetic or magnetisable microbeads immersed in a liquid contained in a capillary tube having a length symmetry axis which defines an axial direction, the transporting being effected in the absence of a static magnetic field in the capillary tube. The apparatus comprises a capillary tube (3) located between the poles of a first row (1) of electromagnets and a second row (2) of electromagnets and an electrical circuit for applying to the coils (10) of the electromagnetic circuits of the first row of electromagnets (1), and to the coils (10) of the electromagnetic circuits of the second row of electromagnets (2), periodical electrical current pulses of uniform duration. The current pulses are applied to the coils (10) in the order of the position of the corresponding electromagnets in the axial direction, successive pulses extending over overlapping time intervals and the phase difference between successive pulses being constant and comprised between 90 and 180 degrees. The application of the electrical current pulses to the coils of the electromagnets generates a time variable magnetic field within the capillary tube (3). The amplitude, polarity and position of this magnetic field varies so with time that the magnetic field moves forward in the axial direction, and thereby causes transport of the microbeads in the axial direction.

IPC 8 full level

**B03C 1/253** (2006.01)

CPC (source: EP)

**B03C 1/0335** (2013.01); **B03C 1/253** (2013.01); **B03C 1/288** (2013.01); **B03C 2201/18** (2013.01)

Citation (search report)

- [X] US 3824516 A 19740716 - BENOWITZ S
- [Y] JP S59196766 A 19841108 - JAPAN ATOMIC ENERGY RES INST, et al
- [Y] WO 9116985 A1 19911114 - DREYFUSS WILLIAM CHESTER [US]
- [Y] GB 1045949 A 19661019 - WESTON DAVID
- [Y] JUNHO JOUNG, JUN SHEN, PIOTR GRODZINSKI: "Micropumps based on alternating High-Gradient Magnetic Fields", IEEE TRANSACTIONS ON MAGNETICS, vol. 36, no. 4, July 2000 (2000-07-01), pages 2012 - 2014, XP002449516

Cited by

AU2011244583B2; FR3125442A1; WO2013041983A1; US9028687B2; US8715494B2; US10675637B2; US9939439B2; WO2010076337A1; WO2015150081A1; US10807100B2; US10799881B2; WO2011131411A1; WO2012116909A1

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Designated extension state (EPC)

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DOCDB simple family (application)

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