Title (en)

Microfluid structure

Title (de)

Mikrofluidische struktur

Title (fr)

Structure micro-fluidique

Publication

EP 2308589 A1 20110413 (DE)

Application

EP 10180301 A 20100927

Priority

DE 102009048378 A 20091006

Abstract (en)

The pressure-operatable microfluidic structure (1) comprises liquid chambers (2), which have closable addition openings (5) and a supply channel (3) and a discharge channel (4) flowing into the liquid chamber. The liquid chamber has a cross-section expanded in a flow direction from the supply channel to the discharge channel opposite to the supply channel and is arranged to expand a cross-section corresponding to the complete cross-section of the liquid chamber through the expanded cross-section and a first liquid volume guided by the supply channel and the liquid chamber. The pressure-operatable microfluidic structure (1) comprises liquid chambers (2), which have closable addition openings (5) and a supply channel (3) and a discharge channel (4) flowing into the liquid chamber. The liquid chamber has a cross-section expanded in a flow direction from the supply channel to the discharge channel opposite to the supply channel and is arranged to expand a cross-section corresponding to the complete cross-section of the liquid chamber through the expanded cross-section and a first liquid volume guided by the supply channel and the liquid chamber. The liquid chamber has a holding position (6) and is formed, so that a second liquid volume delivered into the liquid chamber through the addition opening is kept in the area of the holding position. The second liquid volume is removed from the first liquid volume during pressure-driven passage of the first liquid volume and is fed back into the discharge channel through the liquid chamber. The liquid chamber has less than 2.5 times expanded larger cross-section against the supply channel. The expansion of the larger cross-section of the liquid chamber in the flow direction is formed as constant expansion. The surfaces of the liquid chamber and the supply channel are formed in a wettable manner. The addition opening and/or the holding position are arranged aside to a central flow line from the supply channel through the liquid chamber to the discharge channel. The addition opening is automatically closable by introducing a septum or an elastic cover film. The width of the addition opening is less than 1/100 against the larger cross-sectional area of the liquid chamber. The liquid chambers are arranged one behind the other. The holding position only occupies a part of the liquid chamber cross-section. The holding position is provided with holding structures, so that the two liquid volumes are safely kept by the formation of larger surface in the area of the holding position and/or creation of high adhesion in the area of the holding position by surface modification. The liquid chamber is expanded at only one side in the flow direction and/or is asymmetrically formed for the formation of the holding position in the expansion. The addition opening is opened and closed by an operating device. An independent claim is included for a lab-on-a-chip.

Abstract (de)

Druckbetreibbare, mikrofluidische Struktur (1) zur blasenfreien Vereinigung zweier Flüssigkeitsvolumina mit einer Fluidkammer (2), die eine Zugabeöffnung (5) sowie je einen in die Fluidkammer mündenden Zu- (3) und Ableitungskanal (4) aufweist, wobei die Fluidkammer einen in Durchströmungsrichtung vom Zuleitungs- zum Ableitungskanal gegenüber dem Zuleitungskanal aufgeweiteten Fluidkammerquerschnitt aufweist und eingerichtet ist durch den aufgeweiteten Querschnitt, ein im Wesentlichen druckgetriebenes, durch den Zuleitungskanal und durch die Fluidkammer geleitetes erstes Flüssigkeitsvolumen auf einen zumindest annähernd dem vollen Querschnitt der Fluidkammer entsprechenden Querschnitt aufzuweiten, wobei die Fluidkammer eine Halteposition (6) aufweist und derart ausgebildet ist, dass ein durch die Zugabeöffnung in die Fluidkammer aufzugebendes, zweites Flüssigkeitsvolumen, im Bereich der Halteposition gehalten werden kann und wobei das zweite Flüssigkeitsvolumen beim druckgetriebenen Durchleiten des ersten Flüssigkeitsvolumens von diesem aufgenommen und als vereinigtes Flüssigkeitsvolumen durch die Fluidkammer in den Ableitungskanal weitergeleitet werden kann.

IPC 8 full level

B01F 13/00 (2006.01); **B01F 5/04** (2006.01); **B01F 5/06** (2006.01); **B01L 3/00** (2006.01)

CPC (source: EP US)

B01F 25/314 (2022.01 - EP US); **B01F 25/433** (2022.01 - EP US); **B01F 25/4337** (2022.01 - EP US); **B01F 33/3017** (2022.01 - EP US); **B01F 33/30351** (2022.01 - EP US); **B01F 33/30352** (2022.01 - EP US); **B01L 3/502715** (2013.01 - EP US); B01L 3/5027 (2013.01 - EP US); B01L 3/502746 (2013.01 - EP US); B01L 2200/026 (2013.01 - EP US); B01L 2200/027 (2013.01 - EP US); B01L 2300/0861 (2013.01 - EP US); B01L 2300/0867 (2013.01 - EP US); B01L 2300/161 (2013.01 - EP US); B01L 2400/0406 (2013.01 - EP US); B01L 2400/043 (2013.01 - EP US); B01L 2400/0487 (2013.01 - EP US); B01L 2400/086 (2013.01 - EP US)

Citation (applicant)

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Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR

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