

Title (en)

MICROFLUIDIC-BASED WET SPINNING OF INDIVIDUAL SOLID POLYMER FIBERS

Title (de)

MIKROFLUIDISCHES NASSSPINNEN EINZELNER FESTER POLYMERFASERN

Title (fr)

FILAGE HUMIDE À BASE MICROFLUIDIQUE DE FIBRES POLYMÈRES SOLIDES INDIVIDUELLES

Publication

EP 4269671 A1 20231101 (EN)

Application

EP 22170061 A 20220426

Priority

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Abstract (en)

A method for producing an individual solid polymer fiber from a precursor liquid (L1) comprising polymerizable and/or cross-linkable polymer precursors by microfluidic-based wet spinning comprises the steps of: a) Introducing the precursor liquid (L1) into a first capillary tube (11) coaxially protruding into a second capillary tube (12); b) Producing a liquid fiber with core-shell structure in the second capillary tube (12); c) Optionally, injecting the liquid fiber with core-shell structure produced in step b) into a third capillary (13) tube to produce a fiber with core-shell-sheath structure; d) Guiding the liquid fiber with core-shell structure, optionally having a sheath, as produced in step b) or in step c) through a stationary liquid phase (SP); e) Curing the liquid sheet of the fiber with core-shell structure at least in one of steps c) and d) to provide a fiber having a liquid core (22) embedded in a cured shell (21); f) Collecting the fiber; g) After step f), solidifying the liquid core (22) of the fiber; h) Removing the cured shell (21) from the solid core (22') to obtain the solid polymer fiber.

IPC 8 full level

D01F 8/04 (2006.01); **D01D 5/06** (2006.01); **D01D 5/34** (2006.01); **D01F 8/18** (2006.01)

CPC (source: EP)

D01D 5/06 (2013.01); **D01D 5/34** (2013.01); **D01F 8/04** (2013.01); **D01F 8/18** (2013.01)

Citation (applicant)

- WO 2014143866 A1 20140918 - ARSENAL MEDICAL INC [US], et al
- KR 101695980 B1 20170113

Citation (search report)

- [XAI] US 2012301963 A1 20121129 - TAKEUCHI SHOJI [JP], et al
- [I] US 2013071948 A1 20130321 - TAKEUCHI SHOJI [JP], et al
- [A] PHAM UYEN H T ET AL: "A microfluidic device approach to generate hollow alginate microfibers with controlled wall thickness and inner diameter", JOURNAL OF APPLIED PHYSICS, AMERICAN INSTITUTE OF PHYSICS, 2 HUNTINGTON QUADRANGLE, MELVILLE, NY 11747, vol. 117, no. 21, 7 June 2015 (2015-06-07), XP012197970, ISSN: 0021-8979, [retrieved on 19010101], DOI: 10.1063/1.4919361
- [A] PENG LI ET AL: "Microfluidic fabrication of highly stretchable and fast electro-responsive graphene oxide/polyacrylamide/alginate hydrogel fibers", EUROPEAN POLYMER JOURNAL, PERGAMON PRESS LTD OXFORD, GB, vol. 103, 16 April 2018 (2018-04-16), pages 335 - 341, XP085396891, ISSN: 0014-3057, DOI: 10.1016/J.EURPOLYMJ.2018.04.019

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