

(12) **United States Patent**  
**Ji et al.**

(10) **Patent No.:** **US 10,300,410 B2**  
(45) **Date of Patent:** **May 28, 2019**

(54) **ADVANCED LIQUID CENTRIFUGE USING DIFFERENTIALLY ROTATING CYLINDERS AND OPTIMIZED BOUNDARY CONDITIONS, AND METHODS FOR THE SEPARATION OF FLUIDS**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 880 days.

(21) Appl. No.: **14/635,701**

(22) Filed: **Mar. 2, 2015**

(65) **Prior Publication Data**

US 2015/0246364 A1 Sep. 3, 2015

**Related U.S. Application Data**

(60) Provisional application No. 61/946,940, filed on Mar. 3, 2014.

(51) **Int. Cl.**  
**B04B 1/00** (2006.01)  
**B04B 9/00** (2006.01)  
**B01D 21/00** (2006.01)  
**B01D 21/26** (2006.01)  
**B01D 21/34** (2006.01)  
**B04B 11/02** (2006.01)

(52) **U.S. Cl.**  
CPC ..... **B01D 21/262** (2013.01); **B01D 21/0087** (2013.01); **B01D 21/34** (2013.01); **B04B 1/00** (2013.01); **B04B 9/00** (2013.01); **B04B 11/02** (2013.01)

(58) **Field of Classification Search**  
CPC .. B01D 21/262; B01D 21/34; B01D 21/0087; B04B 9/00; B04B 11/02; B04B 1/00  
USPC ..... 494/37, 44, 76, 77, 79  
See application file for complete search history.

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(57) **ABSTRACT**

Provided is an advanced liquid centrifuge using differentially rotating cylinders moveable rings at the ends thereof, as well as methods for the separation of fluids, preferably liquids.

**16 Claims, 13 Drawing Sheets**

