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Song

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(54) **SEPARABLE TEST TUBE FOR USE IN A CENTRIFUGAL SEPARATOR**

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(58) **Field of Classification Search** **422/72, 422/548-549, 559**
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,583,627 A * 6/1971 Wilson 494/36
5,882,318 A * 3/1999 Boyde 600/595

7,153,477 B2 12/2006 DiCesare et al.
2003/0013205 A1 1/2003 Konrad
2005/0139547 A1* 6/2005 Manoussakis et al. 210/645

FOREIGN PATENT DOCUMENTS

JP 59048740 3/1984
JP 11239574 9/1999

* cited by examiner

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(57) **ABSTRACT**

The present invention includes a separable test tube for use in a centrifugal separator that does not need to separately transfer separation liquid to another test tube for a second separation after a first separation. The separable test tube includes a first tube including a first coupling portion, a second coupling portion, and an adjustment portion. A second tube includes a first body part, a first space portion, a first packing fastener, a third coupling portion which engages the first coupling portion, and an adjustment groove into which the adjustment portion is inserted. A third tube includes a second body part having a second space portion, a second packing fastener, and a fourth coupling portion which engages the second coupling portion. First and second watertight members are coupled to the first and second coupling portions, respectively. First and second packings are coupled to the first and second packing fasteners, respectively.

3 Claims, 10 Drawing Sheets

