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(54) Title: CONTINUOUS GAS SEPARATION SYSTEM COMBINING HYDRATE-BASED PROCESS AND REVERSE OSMOSIS PROCESS AND DISTURBANCE DEVICE

(54) 发明名称: 水合物法联合膜法的连续气体分离系统及其扰动装置

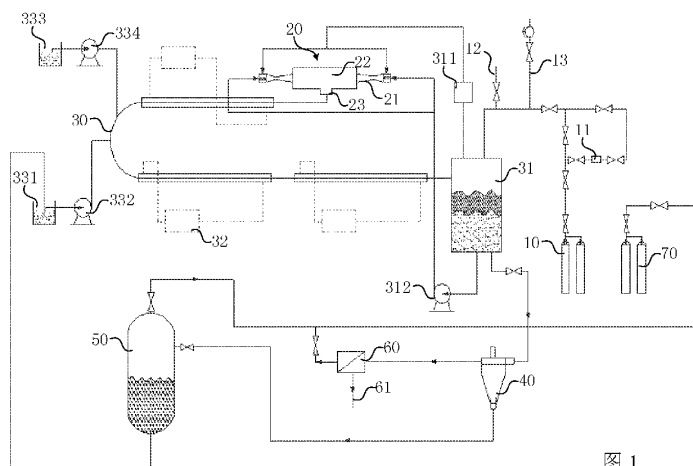


图 1

(57) Abstract: Disclosed in the present invention is a disturbance device, comprising: two jet mixers, which are oppositely disposed in the horizontal direction; a mixing chamber, which is connected between the two jet mixers; and mixing pipes, which are connected below the mixing chamber. The mixing pipes comprise: a central pipe, which is a vertical straight pipe; multiple helical pipes, which are wound in multiple layers and provided outside the central pipe, the diameters of the multiple helical pipes gradually increasing from the inner to outer layers, and multiple flow deflector assemblies being provided at intervals in each helical pipe; and an outer sleeve, which is a straight pipe, the outer sleeve being sleeved outside the outermost helical pipe. Also disclosed in the present invention is a continuous gas separation system combining a hydrate-based process and a reverse osmosis process. The continuous gas separation system

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combining the hydrate-based process and reverse osmosis process and the disturbance device of the present invention can improve hydrate generation efficiency by means of multi-stage coordination and disturbance mixing, and the coupling of lean gas hydration separation and rich gas membrane separation achieves continuous gas separation, thus facilitating scale and industrial application.

(57) 摘要: 本发明公开了一种扰动装置, 其包括: 两个喷射混合器, 其沿水平方向相对设置; 混合腔, 其连接在两个喷射混合器之间; 以及混合管道, 其连接在混合腔的下方, 混合管道包括: 圆心管, 其为竖直设置的直管; 多个螺旋管, 其分为多层缠绕设置在圆心管外, 多个螺旋管的管径从内层向外层逐渐增大, 每一个螺旋管内间隔设置多组阻流组件; 以及外套管, 其为直管, 外套管套设在最外层的螺旋管外。本发明还公开了一种水合物法联合膜法的连续气体分离系统。本发明的水合物法联合膜法的连续气体分离系统及其扰动装置通过多级配合扰动混合, 提高水合物的生成效率, 并采用贫气水合分离和富气膜分离的耦合, 实现了连续气体分离, 易于规模化、工业化应用。