

# Rotating reactor for heterogeneous transfer of substances

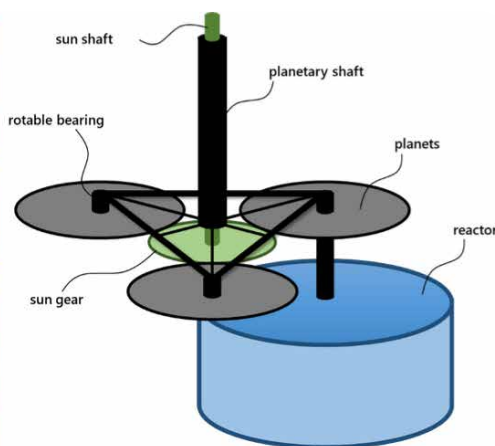
Reference No: B78159

## CHALLENGE

Mass transfer processes are preferably performed via **transfer between a fluid medium and solid reactant**. For example, the solid reactant may be brought into contact with the fluid medium by means of a convective flow to perform the mass transfer between the fluid and solid phases. Some transformation processes may require replenishing the solid reactants, exchanging or adding new solid reactants, removing by-products and/or isolating target products. Moreover, the transformation may be performed in a batch reactor, with the solid particulate reactant being suspended directly in the fluid medium and stirred. Furthermore, the mass transport rate may be unsatisfactory in a case that the solid phase material is carried along with the flow of the liquid phase material, thereby impairing the relative movement between the different materials.

## INNOVATION

This technology promotes an apparatus for a **mass transfer reaction**, comprising a flow distributor and a drive unit. The flow distributor is configured to submerge in a fluid medium and to generate a flow of the fluid by rotating around the rotation axis and the drive unit is configured to move the flow distributor perpendicular to the rotation axis. This allows generating a flow of the fluid medium through a containment of the solid reactant in an effective manner between the different phases. Hence, the rate of the mass transfer reaction, e.g. **by diffusion, adsorption, absorption and extraction** between the fluid medium and the solid reactant is positively affected. The apparatus promotes the mass transfer reaction **without requiring an additional flow system** like additional valves, pumps and pipeworks for controlling circulation, transition or percolation of the fluid medium through the containment of the solid reactant. Compared to existing rotating reactors this technology is fully compatible for the use of very small particles, which tend to be muddy, and **prevents these small particles from blocking parts of the reactor effectively**.

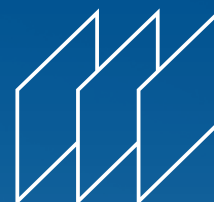


## COMMERCIAL OPPORTUNITIES

- Usable for mass transfer reactions in the fields of **chemistry, biotechnology, pharmaceutical engineering, material processing, food and beverage processing**.
- Mass transfer reactions in **both directions (liquid  $\leftrightarrow$  solid)** and processes like **biocatalysis (immobilized enzymes)** possible
- Especially effective for the use of **small or deformable particles** as solid reactant
- **Easy scalability** from laboratory to industrial usage

## DEVELOPMENT STATUS

Proof of concept



BayPAT

### IP rights:

EP filed in 2018

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