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(54) **SYSTEM AND METHOD FOR IMPROVING THE PERFORMANCE OF DESICCANT DEHUMIDIFICATION EQUIPMENT FOR LOW-HUMIDITY APPLICATIONS**

(75) **Inventors:** **Deepak Pahwa, Delhi (IN); Rajan Sachdev, Delhi (IN); William Charles Griffiths, Palm Beach Gardens, FL (US); Kuldeep Singh Malik, New Delhi (IN)**

(73) **Assignee:** **BRY AIR [ASIA] PVT. LTD., Delhi (IN)**

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See application file for complete search history.

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*Primary Examiner* — Frank Lawrence

(74) *Attorney, Agent, or Firm* — Leason Ellis LLP

(57) **ABSTRACT**

A method and apparatus for energy-efficient desiccant dehumidification of air or other gases to low humidity levels is disclosed. The method and apparatus includes a desiccant rotor (wheel) having more than one dehumidification zone or sector. Separate dehumidification sectors may be used to dehumidify separate air or gas streams, or they may be used to dehumidify a single air or gas stream by passing it through more than one sector. All or a portion of the discharge air or gas from a dehumidification sector is used for all or a portion of reactivation inlet air or gas prior to heating. The desiccant wheel may include more than one reactivation sector, with separate air or gas sources for each sector. The desiccant wheel may include a purge sector between the reactivation and dehumidification sectors to improve the thermal efficiency of the dehumidification process.

**26 Claims, 17 Drawing Sheets**

