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Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, or importing into the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

Michelle K. Lee

Director of the United States Patent and Trademark Office



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

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

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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 156 days.

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See application file for complete search history.

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(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

