



(12) **United States Patent**  
**Lachenbruch**

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(54) **METHOD AND SYSTEM FOR CONTROLLING EVAPORATIVE AND HEAT WITHDRAWAL FROM A PATIENT SUPPORT SURFACE**

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See application file for complete search history.

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(56) **References Cited**

U.S. PATENT DOCUMENTS

2,093,834 A 9/1937 Gaugler  
3,736,764 A 6/1973 Billingham et al.  
(Continued)

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(57) **ABSTRACT**

A method for controlling performance of an MCM capable support surface having a flowpath for guiding a stream of air along at least a portion of the surface, comprises specifying a desired evaporative rate greater than an evaporative rate achievable with unconditioned ambient air, chilling the unconditioned ambient air to a temperature at least as low as that required to achieve 100% relative humidity, thereby demisting the air, and supplying the chilled, demisting air to the flowpath. The method may also include the step of heating the chilled, demisting air prior to step of supplying it to the flowpath. A system for carrying out the method includes a microclimate management (MCM) capable support surface **22**, a chiller **60** for cooling air to be delivered to the MCM capable surface, a user interface **42** for receiving instructions concerning desired microclimate management performance, and a controller **50**, responsive to the instructions, for operating the chiller.

**13 Claims, 8 Drawing Sheets**

