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(54) **VACUUM SWEEP DEHUMIDIFICATION SYSTEM**

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CPC ***F24F 3/14*** (2013.01); ***B01D 53/26*** (2013.01); ***B01D 69/043*** (2013.01); *B01D 2313/24* (2013.01); *F24F 2003/144* (2013.01); *F24F 2003/1435* (2013.01)

(58) **Field of Classification Search**
CPC B01D 53/26; B01D 69/043; F24F 3/14
See application file for complete search history.

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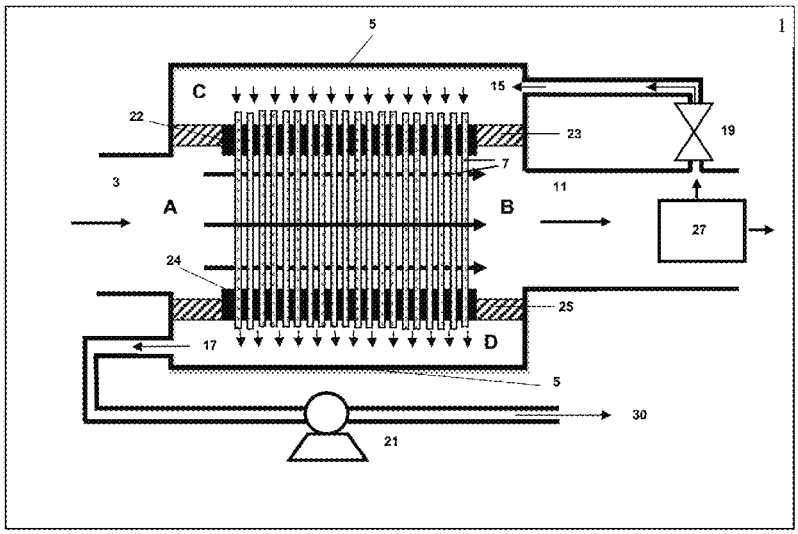
(57) **ABSTRACT**

An apparatus for removing water vapor from a feed gas is provided that comprises a membrane housing, a membrane that divides a first pressure side and a second pressure side of the membrane housing, a feed gas inlet and outlet on the first pressure side, a sweep gas inlet and outlet on the second pressure side, a sweep gas flow regulator, and a pump. In some embodiments the feed gas can be at ambient pressure and a pressure drop across the membrane can be less than about 1 atm.

24 Claims, 11 Drawing Sheets