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[54] **BIOREACTOR PROCESS FOR THE CONTINUOUS REMOVAL OF ORGANIC COMPOUNDS FROM A VAPOR PHASE PROCESS STREAM**

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[*] Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

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[51] **Int. Cl.**[6] **B01D 53/22**

[52] **U.S. Cl.** **95/44**; 95/45; 95/50; 435/266

[58] **Field of Search** 95/44, 45, 47–55; 435/262.5, 266

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[57] **ABSTRACT**

The present invention provides a method for treating volatile hazardous air pollutant (VHAP) and volatile organic compound (VOC) waste products from gas streams. The system disclosed herein employs microporous hydrophobic membranes to remove VHAPs/VOCs from a gas stream into an oleophilic stripping fluid. The stripping fluid is directed into a separate biomembrane reactor wherein the VHAPs/VOCs are transferred across a second microporous hydrophobic membrane into an aqueous nutrient medium, where the extracted VHAPs/VOCs are degraded by microorganisms residing on the surface of the membrane. VHAPs/VOCs are degraded to carbon dioxide, water, and cell debris. The disclosed system uncouples biotreatment from waste generation, such that operation of the biotreatment unit can be continuous and optimized independently of plant work schedules or fluctuations in pollutant concentrations entering the system.

34 Claims, 4 Drawing Sheets