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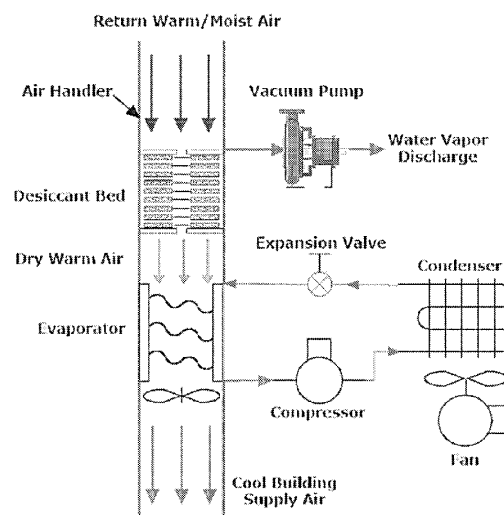
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(54) **Title:** METHOD AND SYSTEM FOR DEHUMIDIFICATION AND ATMOSPHERIC WATER EXTRACTION WITH MINIMAL ENERGY CONSUMPTION

FIG. 1



(57) **Abstract:** Methods, systems and devices for managing humidity within an HVAC system including a nanostructured desiccant porous material configured to adsorb water from an inlet stream at a first air pressure and to release water from that material when subjected to a second air pressure when the second air pressure is lower than the first air pressure is located within a particular location so as to allow for the passage of wet air over the materials and allow adsorption of the water on to the material. When coupled with a vacuum pump water can be collected and released from the materials and the system, regenerating the material for future use and removing water from a stream at a significantly lower cost than existing processes.

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