SORPTION-BASED ATMOSPHERIC WATER HARVESTING DEVICE

Tech ID: 30264 / UC Case 2019-122-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,683,644	06/16/2020	2019-122
United States Of America	Issued Patent	10,640,954	05/05/2020	2019-122

BRIEF DESCRIPTION

Access to clean drinking water is an escalating global challenge, particularly in arid climates where traditional water infrastructure is absent or unreliable. To address this crisis, researchers at UC Berkeley have engineered an atmospheric water-harvesting system capable of extracting moisture directly from ambient air, even in hyper-arid environments with exceptionally low relative humidity. The device utilizes a highly porous metal-organic framework that acts as a molecular sponge, capturing water vapor from the surrounding air. Crucially, the material properties of this framework allow it to release the trapped moisture with minimal energy input. This enables the entire system to be powered by low-grade, renewable energy sources such as natural sunlight. Designed for decentralized use, this technology offers a passive, sustainable solution for delivering pure drinking water directly to individual households in water-scarce, sun-rich regions.

SUGGESTED USES

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Household Water Generation: Providing a decentralized and continuous supply of fresh drinking water for families living in remote, desert, or water-stressed regions.

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Off-Grid Survival Gear: Integrating the technology into portable equipment or military field gear to generate clean water during extended remote operations.

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Disaster Relief Infrastructure: Deploying emergency water-harvesting units to areas where natural disasters have contaminated or destroyed municipal water supplies.

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Small-Scale Agriculture: Supplying localized irrigation for targeted crops or livestock watering stations in regions prone to severe drought.

»

Humanitarian Aid Programs: Implementing low-maintenance, infrastructure-free water solutions as part of global development initiatives in arid developing nations.

ADVANTAGES

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CONTACT

Laleh Shayesteh
lalehs@berkeley.edu
tel: 510-642-4537.

INVENTORS

» Yaghi, Omar M.

OTHER INFORMATION

CATEGORIZED AS

» **Energy**

» Other

» **Environment**

» Other

» **Engineering**

» Engineering

» **Materials & Chemicals**

» Other

RELATED CASES

2019-122-0

Arid Climate Functionality: Demonstrates high efficiency in low-humidity environments that typically render standard condensation-based dehumidifiers useless.

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Passive Solar Operation: Runs completely on low-grade thermal energy from sunlight, eliminating the need for grid electricity, batteries, or fossil fuels.

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High Thermodynamic Efficiency: Requires significantly less energy to trigger the water release process compared to conventional desiccant or boiling systems.

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Decentralized Independence: Minimizes the reliance on complex pipeline networks or centralized water treatment facilities by producing water directly at the point of consumption.

»

Eco-Friendly Footprint: Generates clean water without creating chemical waste, heavy carbon emissions, or disruptive noise pollution.

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Coordinative Alignment Of Molecules In Chiral Metal Organic Frameworks
- Exceptional Zeolitic Imidazolate Frameworks And A General Strategy To Make More
- Hydroxamate-Based Metal-Organic Frameworks
- Mof Heterolites: Mesoscopic Heterogeneity Within Order With Porous Nanocrystals
- PFAS Removal from Water Through Fluorinated Cationic Reticular Materials
- Molecular Weaving Additives To Enhance The Mechanical Properties Of Materials
- Hydrochromic Reticular Materials
- Thiazole-Based Covalent Organic Frameworks For Low-Humidity Water Adsorption

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University of California, Berkeley Office of Technology Licensing
2150 Shattuck Avenue, Suite 510, Berkeley,CA 94704
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