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(12) **United States Patent**
Smithers et al.

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(54) **CHANGING BUOYANCY BASED ON COMBINING A LIQUID WITH A SUBSTRATE**

(58) **Field of Classification Search**
CPC C01B 3/08; C01B 2203/0495; C01B 2203/066; C01B 25/45; C01B 3/00;
(Continued)

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(56) **References Cited**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 595 days.

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(21) Appl. No.: **17/006,465**

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(57) **ABSTRACT**

A technique for varying buoyancy of an apparatus includes providing a substrate configured to produce gas on demand when exposed to a liquid, exposing the substrate to such liquid, and capturing the gas produced by the substrate to increase the buoyancy of the apparatus within a fluid. In some examples, the liquid and the fluid contain the same material, such that gas may be produced using fluid already in the environment.

16 Claims, 7 Drawing Sheets

