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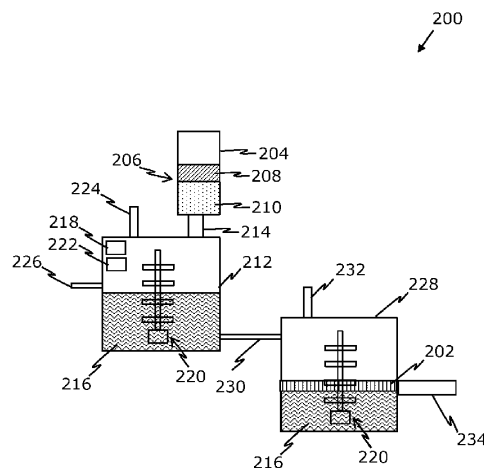


FIG. 2

(57) **Abstract:** Disclosed is a method of growing a microbial mass (202). The method comprises collecting biowaste (206) from an organism, the biowaste comprising a first amount of water (208) and a first amount of solid-phase (210); receiving the collected biowaste in a first reactor (212); treating the collected biowaste in the first reactor using a first set of operating parameters for a first period of time to dissolve at least a part of solid-phase inorganic nutrients into the first amount of water to form a growth media (216); washing the formed growth media, wherein said washing includes sterilization, separation and cleaning steps; providing the formed growth media to a second reactor (228) comprising an inoculum of microbial mass; collecting carbon dioxide locally from an atmosphere; collecting a second amount of water present in the atmosphere and splitting the collected second amount of water into oxygen and hydrogen gas; providing the collected carbon dioxide and the split oxygen and hydrogen gas to the second reactor; growing a microbial mass in the

[Continued on next page]

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second reactor under a second set of operating parameters; and harvesting the grown microbial mass from the second reactor to produce food for consumption by the organism.