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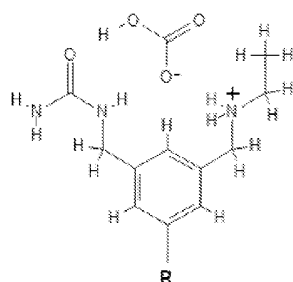
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(54) Title: EFFICIENT BIOMASS CULTIVATION FEATURING LIGHT- AND THERMAL-MANAGEMENT, PROCESSING OF BIOMASS TO USEFUL MATERIALS & MANUFACTURED ARTICLES, NUTRIENT RECYCLING AND CELLULAR AGRICULTURE, BY NEAR-CLOSURE SELF-REPLICATING SYSTEMS

FIG. 2



(57) Abstract: The present invention provides enhanced systems for the efficient cultivation of photosynthetic organisms, methods and means for processing the biomass thereof to useful materials, and fabricating desired articles from said useful materials, including sub-systems of the present invention. Enhancements include light management for efficient utilization of insolated energy, thermal management for utilization of low grade waste heat through ocean thermal energy conversion and/or radiative cooling, for preventing waste heat from operations in ocean deployments from contributing to sea-surface temperature rise and mitigation thereof, improved methods for functional film fabrication via an improvement on roll-to-roll fabrication-roll-to-scroll fabrication, processing of biomass comprising biosilica to silicon carbide and silicon nitride nanoparticles and sintering thereof, and integration of cultivation of primary producers with secondary cultivation of heterotrophic cells for cultured meat production or metabolic engineered production of desired bioproducts.



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