

(54) Title of the invention : SUBAQUEOUS 3D PRINTING DEVICE FOR CORAL REEF RESTORATION

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(57) Abstract :
A subaqueous 3D printing device for coral reef restoration, comprising of an outer enclosure 101 with viewing ports to maintain a sealed environment, a heated print bed 102 and print head 104 enabling precise material deposition, a chamber 107 for consumable materials connected via a universal flange interface 108 to ensure watertight integrity, a pH control unit to stabilize the pH of the aquatic environment, retractable anchoring legs for stability, pressure relief valves to prevent over-pressurization, heaters and a thermoelectric cooler for optimal temperature regulation, cameras for remote monitoring, and leak detection sensors for water ingress warnings. A consumable preparation method combines Calcium Carbonate and Polylactic Acid with algal nanoparticles and porous Argonite to create a biodegradable matrix suitable for coral growth, while incorporating UV-resistant coatings to enhance durability and performance in marine environments.

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