FLOAT TYPE MULTI-FORM OCEAN WAVE ENERGY CONVERTER

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ABSTRACT

The shift from non-renewable energy resources to renewable energy is one of the sustainable development goals set forward by the UN to the member nations. With global energy crisis and problems like global warming and pollution forcing us to make the rapid change in dependence from non-renewables to non-renewables. The development of clean and affordable energy which makes use of the available resources in an area to power itself is a huge step in achieving power in-dependency.

The idea of converting ocean wave energy into useful energy has been around for about a century, the area is still hugely untapped and ready to be explored. The invention described here draws inspiration from various ocean wave energy converters around the globe for example wave dragon, point absorbers with linear generators etc. The design and concept for a wave farm was derived from various systems like solar and wind farms.

The basic individual unit is a Patent pending device which converts the heave and pitch energy of the wave into pumped water and compressed air; it does so by using buoys and flaps. The buoyant force experienced by the buoy pumps up water whereas the weight of the buoy and the weight of the water filling up inside the upper section of a cylinder compresses the air in the lower section. A secondary cylinder beneath the primary cylinder is a source of additional power and protect to the entire system, flaps hinged at the base and connected to the secondary cylinder via links offer protection to the primary cylinder from the horizontal force of the wave by converting it into an oscillating motion which drives a double acting cylinder to pump up water. Water from these individual units is stored in a floating reservoir moored to the sea floor just like a wave dragon. The size of the reservoir can be decided based on number of units in the farm and required output. The energy is extracted using low head Kaplan turbines and generators. The compressed air is send to the air channels in the reservoir helping it float and when the pressure exceeds, due to the up and down motion of the reservoir (caused by the waves) along with the pressure due to the incoming air, pressure relief valve opens and sends air at high velocity through air turbines to convert that energy into electrical energy.

Keywords: Wave energy, Renewable energy, wave farm, Energy harvester, compressed air.