



सत्यमेव जयते

भारत सरकार

GOVERNMENT OF INDIA

पेटेंट कार्यालय

THE PATENT OFFICE

ORIGINAL

No.

97459

## CERTIFICATE OF REGISTRATION OF DESIGN

Design No.	326436-001
Date	24/01/2020 18:41:49
Reciprocity Date*	00:00:00
Country	

Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class 13-03 in respect of the application of such design to FLOATING MECHANICAL WAVE ENERGY CONVERTER in the name of INDIAN INSTITUTE OF TECHNOLOGY MADRAS (IIT MADRAS), THE DEAN, INDUSTRIAL CONSULTANCY & SPONSORED RESEARCH (IC & SR), INDIAN INSTITUTE OF TECHNOLOGY MADRAS, IIT POST, CHENNAI 600 036, TAMIL NADU, INDIA

in pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.

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Copyright in the design will subsist for ten years from the date of Registration, and may under the terms of the Act and Rules, be extended for a further period of five years.

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Date of Issue 12/04/2021 17:12:09

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# IIT MADRAS

Indian Institute of Technology Madras

Industrial Consultancy & Sponsored Research (IC&SR)

Technology Transfer Office  
TTO - IPM Cell



## FLOATING MECHANICAL WAVE ENERGY CONVERTER-

IITM Technology Available for Licensing

### Design

- Waves carry a lot of energy with it in the form of **kinetic energy across its surface which can be utilized for generating electricity**
- Though there are devices (wave energy converters) in this domain to capture the energy, **very few are commercially viable**.
- Hydrodynamic power** (energy content in the waves) is **captured initially by a structural entity** which is then **converted to electricity** through various mechanisms **such as mechanical, hydraulic, pneumatic, electro-magnetic systems**.
- A **bean shaped multi body floating mechanical wave energy converter device** is analyzed, designed and developed in four configurations of – three bean, four bean, six bean, eight bean and torus shapes.

### Intellectual Property

- IITM IDF Ref.1979
- IN 326436-001 Design Registered

### Class of Design

**Class- 13:** Equipment for production, distribution or transformation of electricity (conversion of ocean wave energy to electricity)

### Technology Category/ Market

#### Category- Design

#### Industry Classification:

- NIC (2008)- 35106-** Electric power generation using other non conventional sources; **2710-** Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus.

#### Applications:

Offshore wave energy generation

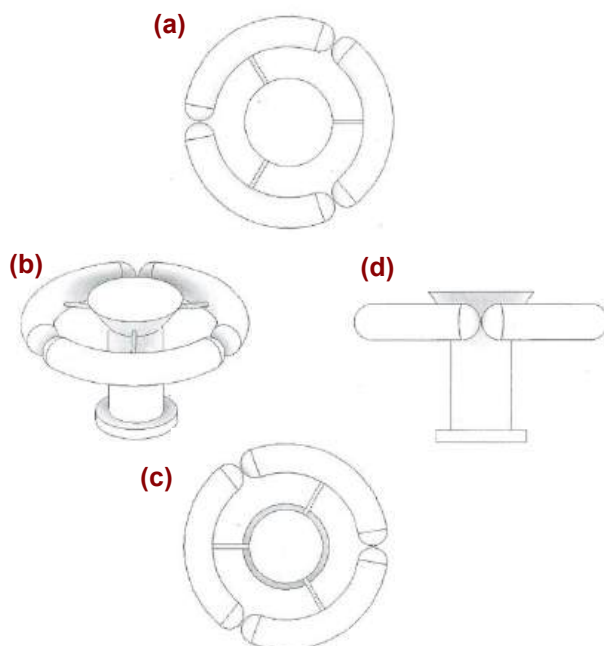
#### Market drivers:

The global renewable energy market size was estimated at USD 1.21 trillion in 2023 and is expected to grow at a compound annual growth rate (CAGR) of 17.2% from 2024 to 2030.

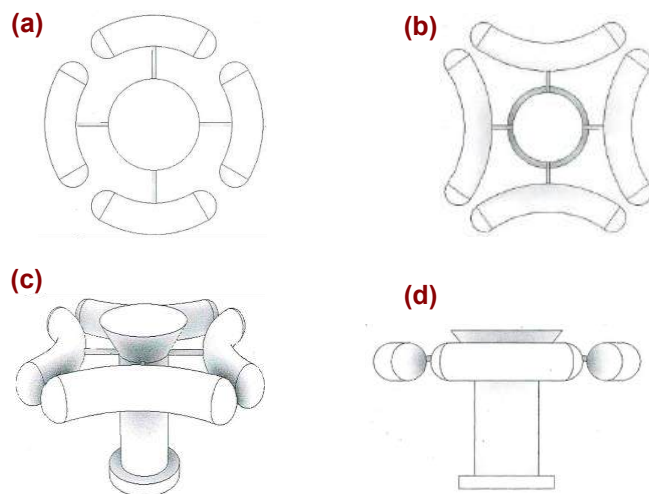
### Research Lab

**Prof. Srinivasan Chandrasekaran & Sri Charan**  
Dept. of Ocean Engineering

### Design



**Figure:** Description of the three bean shaped floats for a wave energy converter with (a) top view; (b) perspective view; (c) bottom view and (d) side view



**Figure:** Description of the four bean shaped floats for a wave energy converter with (a) top view of four bean shaped floats; (b) top view of inverted four bean shape floats; (c) perspective view of inverted four bean shaped floats (d) side view of four bean shaped floats

### CONTACT US

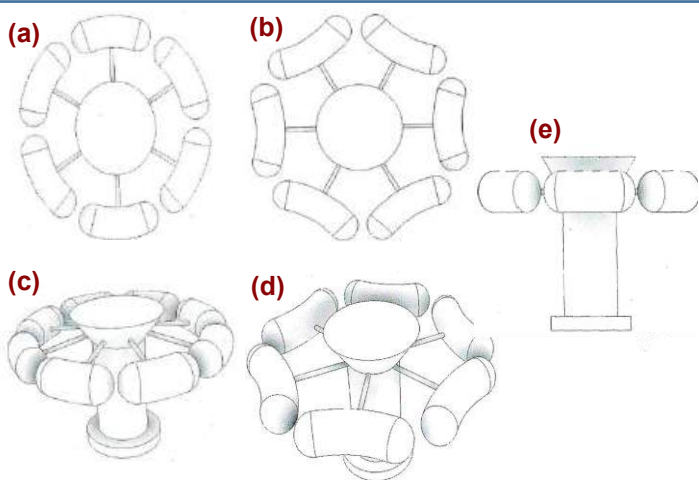
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**IITM TTO Website:**  
<https://ipm.icsr.in/ipm/>

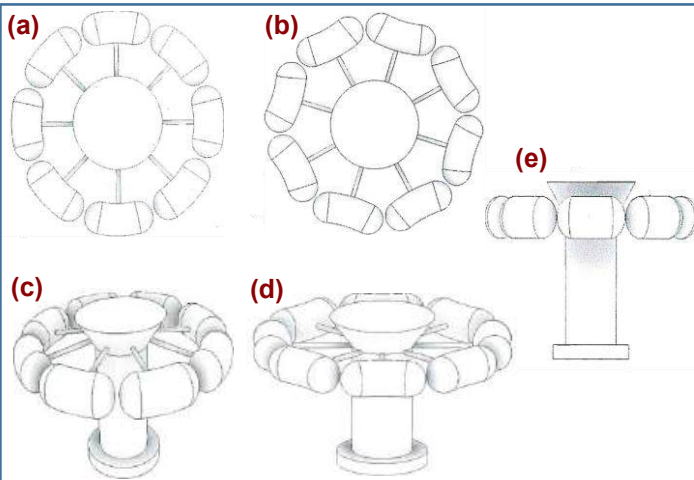
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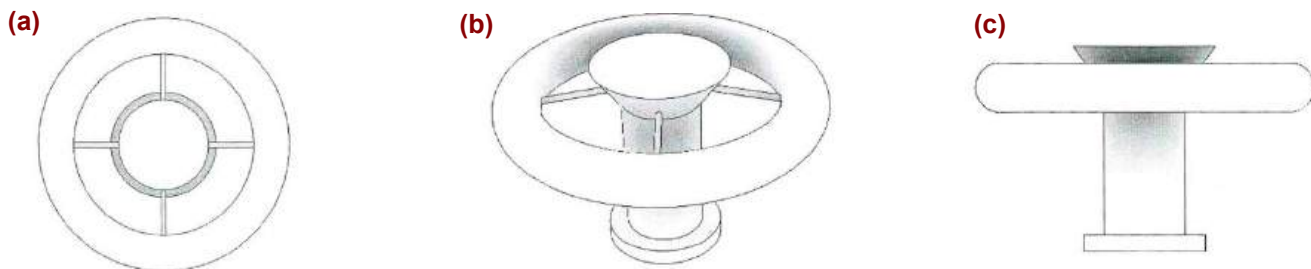




**Figure:** Description of the six bean shaped floats for a wave energy converter with (a) top view of six bean shaped floats; (b) top view of inverted six bean shape floats; (c) perspective view of six bean shaped floats (d) perspective view of inverted six bean shaped floats (e) six bean shaped floats in side view



**Figure:** Description of the eight bean shaped floats for a wave energy converter with (a) top view of eight bean shaped floats; (b) top view of inverted eight bean shape floats; (c) perspective view of six bean shaped floats (d) perspective view of inverted eight bean shaped floats (e) eight bean shaped floats in side view



**Figure:** Description of the torus shaped float for a wave energy converter with (a) top-view of the torus shaped float; (b) perspective view of the torus shaped float and (c) side-view of the torus shaped float

### Advantages of the design

- Compared to conventional designs the developed design can produce electricity irrespective of ocean wave direction.
- Individual devices can be connected in group to make it a cluster of devices which makes the grid fluctuations smoother.

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