Design and construction of a triple-electric single-electrode spiral Nano generator, in order to harvest energy from random environment movements

**Abstract**

 In this paper, a triboelectric single-electrode spiral Nano generator has been designed and constructed. This special design is such that can simultaneously convert mechanical and rotary energy into electrical energy. In most Nano-constructors with different structures, the maximum output power only in one direction or a certain path is obtained, and as soon as the predicted mode or path is changed, the power output decreases sharply; But the Nano-generator is completely independent of the direction and motion, and can be used to remove energy from unpredictable and random movements. Due to this ability, this structure can be used in small dimensions in order to harvest energy from the motion of the sea waves and the movement of the axis of industrial devices and in larger dimensions in wind turbines moving at variable speeds and in different directions. To be used. In this Nano-generator, the contact is screwed onto the electrode. To check the effect of the number of distances, other parameters including the thickness of the electrodes, the distance between the electrodes and the scanning frequency of 25μm, 1.5mm, and 2Hz are considered constant. The number of rounds used is 4, 8, 16, and 20 round. At low frequencies, the Nano generator has the ability to generate a power of 1.21 mW / m2, which will increase with increasing frequency of oscillations.