Water purification using reverse osmosis powered by wave energy or muscle power.

Abstract

Human muscle power or renewable energy sources like sea wave or wind or any possible source of renewable energy is used to provide the pressure to water to perform the reverse osmosis process. Water purification is done by increasing the pressure on saline or dirty water slowly using screw impeller.

Brief Summary

The presented technique for purifying water using reverse osmosis is powered using either human muscles power or any renewable energy source like sea wave energy or wind energy or sunlight. To pressurize the water, a screw is used, which is rotated in one direction. This screw is enclosed inside a pipe, with water proof head at the front, so water doesn't leak in backward direction of its movement. The screw is turned in one direction, so it moves inside the pipe, which contains the water, which needs to be purified. There are multiple semi permeable membranes are attached on the other end of the pipe, which prevents the entry of particles, which needs to be filtered from the water. At the end of the pipe, only purified water is moved and all unwanted particles/bacteria are left inside the membrane, which are discarded automatically when screw is rotated in opposite direction. A flywheel can be used to make this system more efficient.

Operation:

The screw can be rotated by human muscle power or it can be rotated using force, which is imparted by wave on either a flap or propeller or buoy. When wave hits the propeller or buoy or flap, the wave energy is converted into rotational energy. This rotational energy is transferred to the screw using attached rachet, which turns the screw in only one direction. For every consecutive wave hitting the assembly, the screw is rotated partially in one direction. When screw keeps rotating, it creates pressure on the water, which is inside it. The pressure helps to perform the reverse osmosis on water, where impure water is forced to go through the semipermeable membranes. At this time, only pure water is allowed to pass through the membranes and the impurities are trapped inside the membrane and back of the membrane. Which can be discarded when the screw movement is completed till the specified length of pipe.

That movement is then reversed and the other end of the screw again starts operating on the other side of the pipe in the assembly.

A flywheel and or gearbox can be used to smoothly and continuously transfer the power to screw for rotation. The usage of flywheel improves the efficiency and performance of the system and can produce more water in available energy supply.

Drawing: