Innovative Technology of Increasing Solar Cells' Efficiency by Surface Modification with Lenticular Screen

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Offered device transforms solar energy into electricity and heat. Our goal is to increase efficiency of polycrystalline solar cells by encapsulating them with silicon compound layer, previously forming it under negative lenticular lens matrix. Commonly, encapsulation is done because it protects cells from atmospheric precipitation. In industrial scales mostly poly and mono crystalline solar cells are used. Polycrystalline cells are cheaper but less efficient. The efficiency of poly cell increases by cooling and by increasing light intensity. For cooling we use the carbon composite as a heat sink and copper pipes with water, attached to it. Carbon also decreases the total weight, simultaneously increases rigidity of the support frame. Parabolic reflector or Fresnel lens may be used to concentrate light. We placed solar cells on the truncated octahedron pyramid made from carbon composite and mounted it in the parabolic reflector (As exhibited). However, all this is futile when cells are intended for large solar plants. The proposed innovative technology is based on the following: Redistributing light intensity with attached lenticular screen on the cells' surface, transversally to the silver conductive strips (so that illuminated area crosses strips). The increase of efficiency is based on its nonlinear dependence on light intensity: it decreases somewhat in some areas, while decreasing light intensity, but increases dramatically in nearby areas where the intensity is increased. Cells, manufactured that way can also be used on spaceships. In the exhibited device parabolic reflector orients itself to sun guided by light sensors and servomotors. Extra functions of this reflector are TV, Wi-Fi and radio antennas and a source of warm water, important for rural places.