

Abstract

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Concentrator Solar Stove With Tracking System

Abstract: Solar radiation arrives the surface of the earth at maximum power density of approximately 1kW/m^2 . The actual usable radiation component varies depending on geographical location. Egypt, as well as most of the other Middle East countries enjoys an abundance of solar radiation, therefore systems utilizing solar energy are actively being developed. Solar cooking is a technology which has been given a lot of attention in recent years, especially, in developing countries. The solar stove can be classified into two types with heat box type and concentrating type. The heat box type solar stove is featured with simple structure, low cost, convenient utilization but is limited in efficiency with moderate temperature which can only be suitable to braise and bake the food in a long time resulting in more utilization limit. Now the concentrating solar stove is broadly applied with the feature of high cooking efficiency, high temperature, short cooking time and strong applicability. This study describes the design, fabrication and performance testing of a parabolic concentrating solar stove. The concentrating collector was equipped with a solar tracking system using light dependant resistor to seek the maximum light of the sun. Using this design, the parabolic concentrating solar stove with the tracking system, up to 50% more energy was collected than the fixed collector. Such performance enhancement will pay back for the extra initial cost and increase the utilization property.