INTRODUCTION

Half the world's people must burn wood or dung to cook their food. wood cut for cooking purposes contributes to 16 million hectares of forests destroyed annually. Solar cooker is safe in expensive and easy to use. Solar energy being a renewable source of energy is clean and does not contribute to the degradation of environment. Today when the whole world is looking for alternative sources of energy so as to reduce the dependence on the conventional resources, solar energy is one of the best options for us to explore. Solar energy is easily available around the world and specially in the Indian sub- continent, it is available throughout the day for a major part of the year. This solar energy can be used effectively for various purposes.

Basic principle of a solar cooker: **C.A.R.E.S**

*C*ollect the light

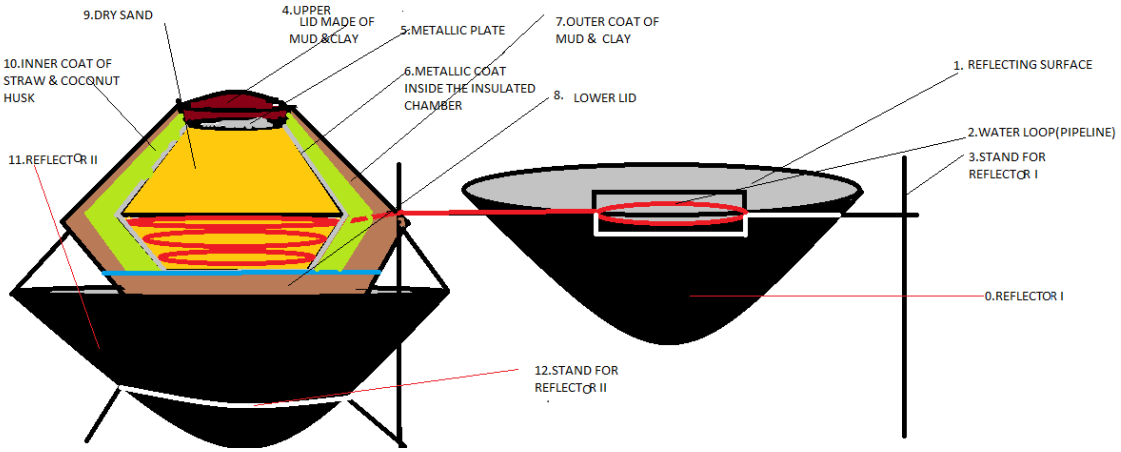
*A*bsorb the light

*R*etain the heat

*E*ase and efficiency

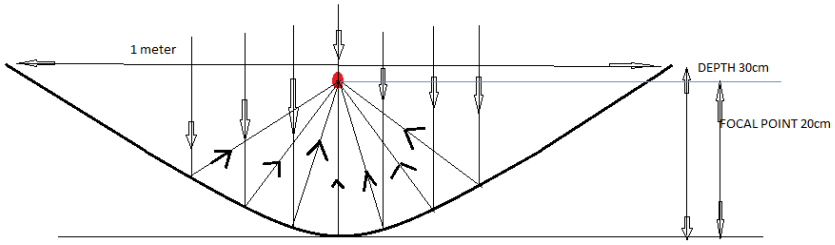
*S*afety

DESIGN OF SOLAR COOKER



THE SHAPES SHOWN IN THE DESIGN ARE NOT UPTO THE PARAMETRES.

PARAMETERS HAVE BEEN SHOWN SEPARATELY.



BOTH THE REFLECTORS ARE OF SAME PARAMETERS.

CONSTRUCTION:

The design consists of two reflectors(0.&11.) and an insulated chamber(placed on a stand above the reflector II).

The reflector I(0.) is used to cook during the sunshine by concentrating the sun's heat directly on the metallic plate. The food item is placed on a metal plate which is kept at the focal point of reflector.

The metal plate is surrounded with a water tube() which gets heated up due to conduction .As a result of this heat the water eventually gets converted into steam.

The reflector II(11.) consists of a huge pot which is basically an insulated chamber.

This reflector concentrates the sun's heat on to the metallic covering which lies above the lower lid of the pot .

The outer coat of the pot is made up of mud or clay. Further there lies an inner coat of coconut husk and straw. This is the main insulation of the pot which keeps the heat inside without allowing it to escape. Finally there is an inner covering of aluminium sheet inside the chamber.

Sand or salt ,whichever is easily available, is kept inside insulated chamber or pot.The sand is heated with the help of the water loop inside the chamber.

The pot has two lids ,one at the mouth of the pot (4.) and the other one is at the bottom of the pot(8.).A metal plate is placed below the upper lid(4.) or the the mouth.

The lower lid can be removed during the day so as to concentrate the sun's energy directly on to the inner metallic covering of the pot exposed on removing it to heat up the dry sand by means of reflector.

The wooden stands have to be made as shown in the fig.

WORKING

During the day, the cooking basically takes place using reflector I. The food item to be cooked is kept on the plate placed at the focus of the reflector. Thus the food gets cooked due to the direct rays of the sun which are focused on it by the reflector I. The plate above this reflector above which the food item is to be kept is surrounded by a water loop. this water loop spirals into the pot above reflector II into the region having dry salt or sand.

Meanwhile due to conduction the water tube also gets heated and the water present inside it eventually gets converted to steam.this steam produced in the tube is used to heat the sand present inside the pot. during sunshine, the lower lid of the pot is also removed.as a result of this the sun's rays are reflected on to the innermost metallic sheet of the pot to heat up sand present inside the pot. Thus the dry sand inside the pot gets heated further.

The heat energy present inside the pot is not allowed to escape out as the pot is well insulated by means of coconut husk and straw. As a result of this the heat is retained inside the pot which can be used after the sunset when required. After the sunset ,the bottom lid should be properly closed.

After sunset the heat energy retained by the sand or salt inside the insulated chamber will be used for the purpose of cooking by removing the upper lid. The food item to be cooked at night can be placed on the metal plate that is present below the upper lid. The pressure cookers can also be placed on the metallic sheet as per need.

ADVANTAGES:

- The materials used are generally available in most villages.
- The prototype can be easily replicated by the villagers as much engineering skills are not needed.
- The design ensures higher durability of each part.
- Most of the materials are homely available except for the aluminium sheet.
- The parabolic reflectors ensure higher concentration of heat.
- Glasses have not been used because of ill effects of their reflection.
- The prototype can be made movable by placing wooden wheels to the stands
- The insulated pot ensures higher retaintion of heat.
- The pot can be taken anywhere as per the need and comfort.
- Salt or sand used here can attain much higher temperatures .further insulated chamber en sures the heat retaintion.

TEAM MEMBERS-

1.GOPAL KUMAR ROY, ME 2ND YR, roygopal34@gmail.com

2.SIMRAN JENA, CSE 3RD YR, simran.charminggirl@gmail.com

3.ABHISHEK BISOI, ME 2ND YR, bisoi.abhishek@gmail.com

4.SANIT KUMAR,ME 2ND YR, sanit.kumar.0001@gmail.com