

**SIR PADAMPAT SINGHANIA UNIVERSITY**

Udaipur (Raj.)

**Synopsis of the Endeavour Project**

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| 1. | Name of Candidates | : | Ronak Mathur | (14ME001849) |
|  |  |  |  |  |
| 2. | Minor Discipline | : | Mechanical Engineering |  |
| 3. | School | : | School of Engineering |  |
| 4. | Date of registration | : | 22nd August 2017 |  |
| 5. | Project Mentor | : | Mr. Lalit Yadav |  |
|  |  |  | Asst. Professor (Mechanical) | |
|  |  |  | Sir Padampat Singhania University, | |
|  |  |  | Udaipur |  |

**Endeavour Project**

Sir Padampat Singhania University, Udaipur

**Solar space heating through active circulation system by using empty cold drink cans**.

**Introduction:** Solar space heating systems are an effective and excellent way to reduce costly energy bills during your heating season. A solar space heater works alongside your current heating system to use the sun's energy to reduce your consumption of oil, propane, or other fossil fuels. Traditionally used with solar [evacuated tube collectors](http://www.solarpanelsplus.com/products/evacuated-tube-collectors/), these systems work to provide free, solar heating for your home throughout your entire heating system. These solar heating systems can also be combined with our solar-ready ultra-high efficiency [DC-Inverter heat pump chiller](http://www.solarpanelsplus.com/commercial/solar-cooling/index.php).

**Review of existing relevant literature:** A glazed glass or polycarbonate panels make up the front of the device, allowing the sun’s rays to enter it while restricting heat loss to the outside air, and the box is also insulated for more efficiency. When exposed to the sun, the air inside the solar heater begins to warm, and as it does, it rises to the top of the box and can be ported directly into the house. To improve the space heating system, using knowledge of solar energy, and understanding and controlling heat flow is the key to space heating design, so that we can get maximum output in winter season.

Mr.Greg, September 5, 2010, Building a Solar Air Heating Collector from Soda-Pop Cans

This solar air heating collector uses recycled aluminium soda pop cans for the absorber. The pop cans have the tops and bottoms drilled out, and are assembled into vertical columns that the air passes through. The black painted soda pop cans are heated by the sun. The solar heat is transferred to the air passing up through the columns of can. A manifold at the bottom supplies room air to all the can columns, and a similar manifold at the top of the collector collects the heated air for distribution back to the room. The combination of uniform air distribution to the whole collector and the large amount of heat transfer area from the cans to the air makes for an efficient collector. My collector also uses Twinwall polycarbonate glazing -- this is a type of double glazing that reduces heat loss and increases the efficiency of the collector.

**Objective:** The aim of this project is to build a solar space heater using active circulation system through cold drink cans. . In this proposed system, solar space heater design through uses beer soda cans to increase the surface area for heat transfer inside of it, and in its most basic design, uses no external power to move the air. Heat flows from a hot body to a cold body until the two are at equal temperatures – Understanding and controlling heat flow is the key to space heating design.

**Methodology:**

The methodology of proposed system is as follows:

* According to requirement we design proposed solar space heating system, which mainly uses heating the space in comfort manner. Space heating through empty beer/cold drink cans. The cans are needed to assemble the metal heating tubes, air is circulated in these tubes through a blower (active circulation system) and air becomes heated up through solar energy when optimum sunlight is utilized.
* Choose the space for heating & installed of proposed system.
* Collect and analysis the data of temperature and velocity of air.
* Fabricate the insulated wood box in which we arrangement empty cans in tubes form.
* Cover the upper part of system with toughened glass which transmits maximum sun light.
* Arrange the header pipes at inlet and outlet, a flexible pipe also attached with out- let pipe by which we can allow hot air inside the room/space.
* Thermometer is used to measure temperature at inlet and outlet of pipe.

**Timeline:**

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| **Milestones** | **22nd Aug.**  **to**  **10th Sept.** | **11th Sept.**  **to**  **27th Sept.** | **28th Sept.**  **to**  **30th Oct.** | **1st Nov. to**  **30th Nov.** | **1st Dec.**  **to**  **20th Dec.** | **Submission** |
| 1.Literature survey |  |  |  |  |  |  |
| 2. Analysis |  |  |  |  |  |  |
| 3.Working model synthesis |  |  |  |  |  |  |
| 4.Interpretation of result |  |  |  |  |  |  |
| 5.Report preparation |  |  |  |  |  |  |

**Reference:**

1. openei.org/wiki/Solar\_space\_heating

2. energy.gov/energysaver/active-solar-heating

3. solarpanelsplus.com/residential/solar-space-heating.

4. http://www.instructables.com

5. Text book-Solar energyby-HP Garg & J Prakash

6. Text book-Solar energyby-Sukhatme and Nayak

7. Text book-Solar energyby-GN Tiwari

**Name and signature of the candidates:**

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| 1. | Ronak Mathur |  |
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**Name and signature of advisor:**

Mr. Lalit Yadav

Assistant Professor (Mechanical Department)

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