



# HOUSE HOLD SOLAR INCINERATOR

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**Abstract:** Our problem statement is about waste management in India. In our country, we keep our houses by dumping the waste into public spaces. To overcome this problem of waste dumping in public spaces we have built an incinerator, which is powered by solar energy. We proposed an innovative incinerator, which has a scrubbing module attached to it. The advantage of our proposed model is that it burns out all the waste and the by-product is clean air and ashes. This can further help in ensuring clean public space, clean water bodies and polluted ground water. The system we have developed can be customized based on requirement.

**Index Terms -** Incinerator, Venturi scrubber, Cyclonic Spray Scrubber, Heater, Water purifier.

## I. INTRODUCTION

Our problem is focused on waste management in India. These waste dump yards do not have proper on-site waste management thereby contributing to other threats like fires in dump yards. Over a period of time these dump yards dissipate into the soil, pollute ground water, and emit potentially harmful gases. Every year lakhs of rupees of the taxpayers money is spent on clearing these dump yards. Although the government is taking various measures, for waste management no this will be effective if it does not start with an individual household. This system is an effective waste management solution.

## II. LITERATURE REVIEW

In the old type of product, we do not have heater position part and motor and there is no automatic work. It takes more current and it is not suitable for all the users. To overcome these problems we include heater position part, pump and automatically off the function. We can easily use anywhere and it is compact.

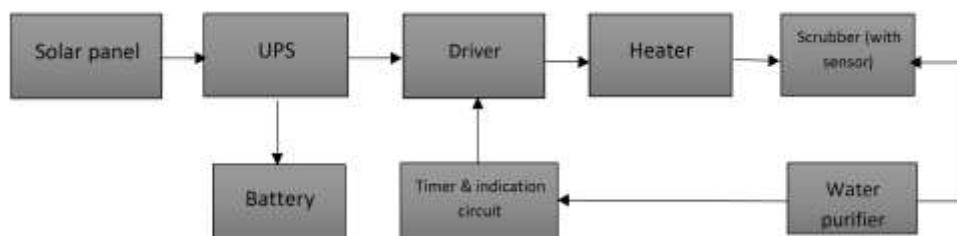
## III. BLOCK DIAGRAM

Solar Incineration is a waste treatment process that involves the combustion of organic substances contained in waste materials. Our product consists of a metal bin made of mild steel, which houses a ceramic band heater. The waste is dumped into the metal bin and the heater incinerates the waste. Incineration of waste materials converts the waste into ash, flue gas and heat. The ash is mostly formed by the inorganic constituents of the waste and may take the form of solid lumps or particulates carried by the flue gas. The flue gases must be cleaned of gaseous and particulate pollutants before they are dispersed into the atmosphere. In some cases, the heat generated by incineration can be used to generate electric power. Venturi scrubber that is the heart of our system purifies smoke from the incinerator and it is released into the atmosphere.

### The design for the household venturi scrubber is the innovation of our design.

Ash from the incinerator can be used as organic fertilizer (optional). Waste water from venturi scrubber can be recycled and it is used again for domestic as well as agricultural purpose.

This system is an effective waste management solution, which produces by products that are environment friendly.



**Fig.1** General Block diagram of the proposed system

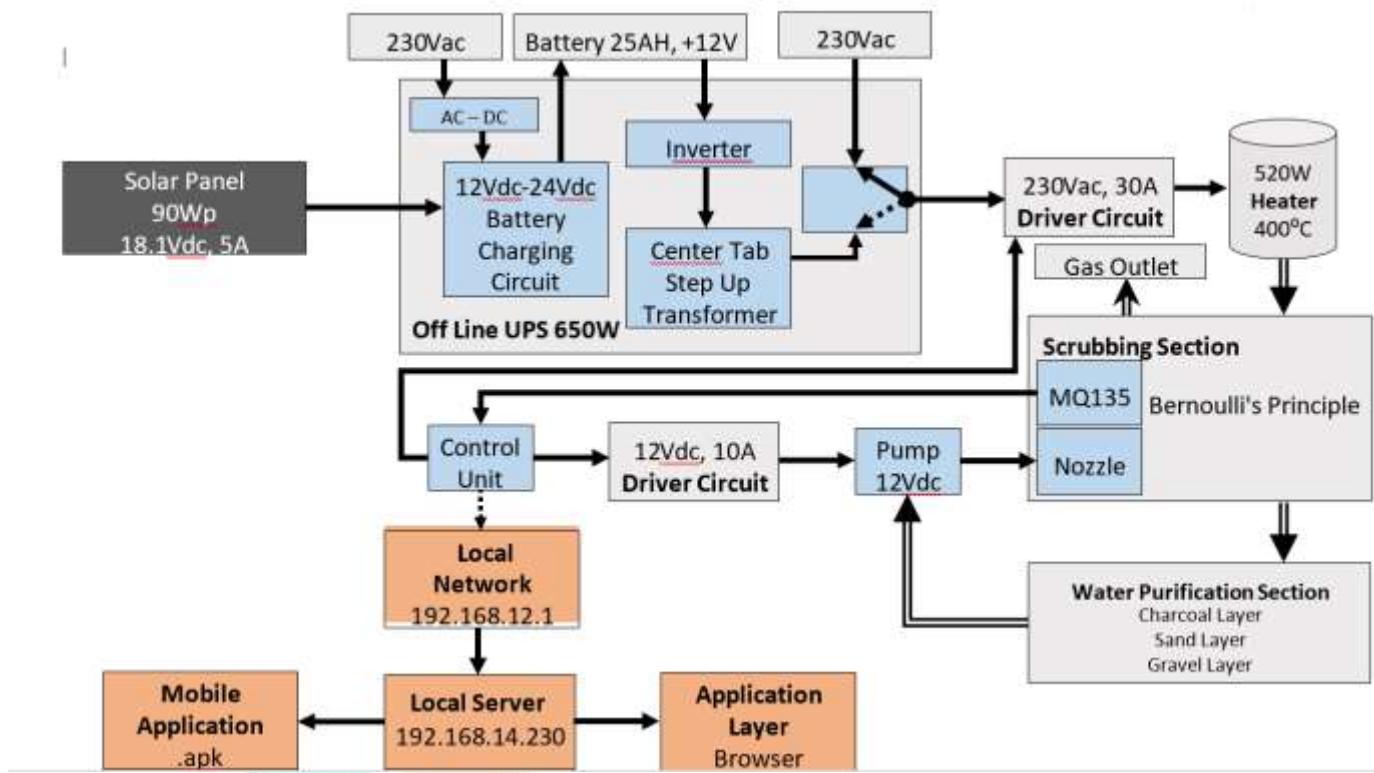


Fig.2 Detailed block diagram of the proposed system

Solar Incineration is a waste treatment process that involves the combustion of organic substances contained in waste materials. In this use case, we have two parts, one is heater position and another one is scrubber position. Heater is placed outside of the home and it is 600 Watts. Size of the heater is small and compact so it can easily use in home. In scrubber position, we have pump for users. If we on, it works continuously till the function end. If any chemical gas produce, it off automatically. This suggestion will hugely affect the waste problem in our country.

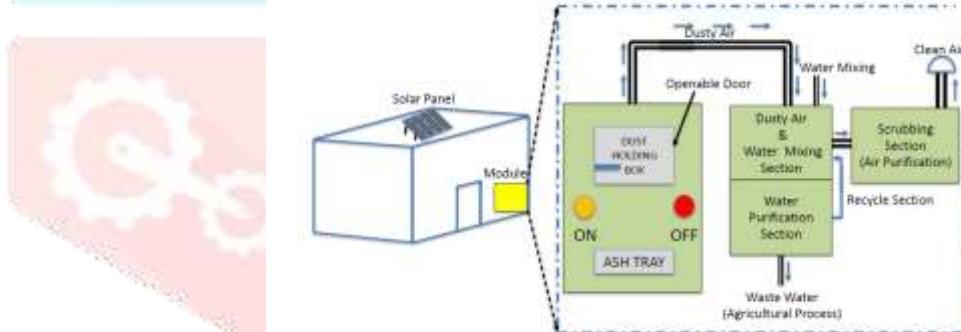


Fig.3 Detailed Use Case diagram of the proposed system

## 2.1 Experimental Setup

Solar Incineration is a waste treatment process that involves the combustion of organic substances contained in waste materials. Our product consists of a metal bin made of mild steel, which houses a ceramic band heater. The waste is dumped into the metal bin and the heater incinerates the waste. Incineration of waste materials converts the waste into ash, flue gas and heat. The ash is mostly formed by the inorganic constituents of the waste and may take the form of solid lumps or particulates carried by the flue gas. The flue gases must be cleaned of gaseous and particulate pollutants before they are dispersed into the atmosphere. In some cases, the heat generated by incineration can be used to generate electric power.

Venturi scrubber, which is the heart of our system, purifies smoke from the incinerator and it released into the atmosphere.

The design for the household venturi scrubber is the innovation of our design. Ash from the incinerator can be used as organic fertilizer (optional). Waste water from venturi scrubber can be recycled and it used again for domestic as well as agricultural purpose.



**Fig.4** Experimental Setup

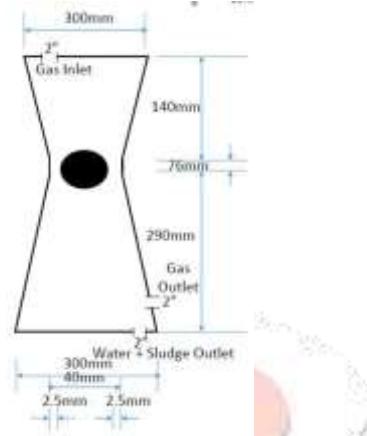
### 3.1 Scrubber

#### 3.1.1 Venturi Scrubber

Venturi scrubber is a type of air pollution control devices based on Bernouli's principle for removing gases and pollutants from the gas. It is also known as wet scrubber, venturi jet scrubber, gas atomizing spray scrubber and eject scrubber. Venturi scrubbers have a high yield of 70 to 90%.



**Fig.5** Incinerator and Venturi Scrubber



**Fig.6** Venturi Scrubber design

Since the Venturi scrubber used has a problem of instability, we could rather prefer cyclonic spray scrubber that works under the same Bernoulli's principle, in order to overcome this effect.

#### 3.1.2 Cyclonic Spray Scrubber

Cyclonic spray scrubbers are used in air pollution control technology. They use both dry cyclone and a spray chamber to remove pollutants. It is generally low to medium energy devices. It is widely used because of its better capacity and efficiency to remove fine particles and pollutants from the gas streams.

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## IV. RESULTS AND DISCUSSION

### 4.1 Results of Descriptive Statics of Study Variables



**Fig.7** Test Case: Testing Solar Panel Parallel Connection



**Fig.8** Test Case: Testing Solar Panel and UPS without Load



**Fig.9** Test Case: Testing Solar Panel and UPS Connection



**Fig.10 Test Case:** Normal Water PH Testing (8.21PH)



**Fig.11 Test Case:** Salt Water PH Testing (9.81PH)



**Fig.12 Test Case:** Soil Water PH Testing (10.01PH)



**Fig.13 Test Case:** ASH Water Testing (10.28PH)

Our product provides a result in terms of stopping household waste dumping in public spaces. This can further help in ensuring clean public space, clean water bodies and polluted ground water. The system we have developed can be customized based on requirement. Our product can be used for managing the waste at the individual house, apartment complexes and even entire municipalities, where the process of waste collection and separation is already is taking place.

#### V. ACKNOWLEDGMENT

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