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Capture Carbon Particulates from Vehicular Emission

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Abstract:- We live in areas that don't meet federal air quality standards. Passenger vehicles, heavy duty trucks and busses are a major source of this pollution, which includes ozone, particulate matter, and other smog-forming emissions. The health risks of air pollution are extremely serious. Poor air quality increases respiratory ailments like asthma and bronchitis, heightens the risk of life-threatening conditions like cancer, and burdens our health care system with substantial medical costs. Particulate matter is singlehandedly responsible for up to 30,000 premature deaths each year. The purpose of the experiment was to find out a solution for Air pollution and make the best use of carbon particulates captured out of Air pollution.

I. INTRODUCTION

In this project we are making an effort to Capture the carbon using a filter named 'Capture C6'emitted from the vehicles and prepare 'Car-burn ink' out of it .The novelty of the innovation is that the filter can be customise based on the size of the car and can be reused again and again which is very cost effective. The end waste carbon collected can be used for printing newspapers, making printers ink cartridges, paints etc.

II. LITERATURE SURVEY/ MATERIALS & METHODS

India tops global pollution deaths of 9 million a year: study LONDON (Thomson Reuters Foundatin)

Procedure Used Air pollution can be defined as the presence of toxic chemical compounds at high levels that pose many health risks as well as deaths. One of the major air pollutant that pollutes the air is C6 i.e. Carbon.

➢ *Method*

The material used for particle filtration is made of randomly arranged glass microfibers with various diameter 1-10 µm. This glass wool placed in between the filters has the ability to trap Air borne particles. The holes in the filters are placed in zig zag way so that the air passes through the device in zig zag manner which increases the air flow surface area and hence more adsorption of carbon particles to the glass wool. During the flow carbon particle gets close to the fiber, collides with the fiber, gets caught and sticks to the fiber, trapping the particles. The zigzag passage for the airflow will ensure arrest of the solid particles in the passage. Physical and mechanical properties involved are Interception, Inertial Impaction, diffusion and Electrostatic attraction.

So, in this project we are making an effort to capture the carbon using a filter named 'Capture C6'emitted from the vehicles and prepare 'Car-burn ink' out of it .Capture C6 can be made as follows:

- The initial model of Capture C6 was made using an old Muffler case from a garage, modified and fit to the tail pipe of the car. The catalytic converter in the case trapped the carbon efficiently but the model was found heavy.

III. PROPOSED WORK [PROPOSED IDEA] AND DISCUSSION

After many trial and errors we came up with a simplified model No2 that can fit to any running vehicle and trap carbon efficiently. Hand drilled filters are placed with size of the holes all over the plate varying from 1mm,0.5mm and 0.1mm in descending order. Glass wool (made of glass and sand at 1500 degrees) was found to be a good carbon trapper and an insulator which we placed between the filters. This model was fit to the car and most of the carbon got trapped in the device and particulate free air was left out. After further research, we came with a model No 3, which is found to be more efficient than the first 2. Here, the holes in the filters are placed in a zig zag way and the air also passes in a zig zag manner increasing the air flow surface area which helps glass wool to capture more carbon.

IV. EXPERIMENTAL RESULTS [WITH TABLES/ GRAPHS/ FIGURES]

➢ The idea has been successfully tested and a working prototype has been developed.
➢ The carbon captured in all the three models are used to prepare ink and we named it Car-Burn ink.

Fig 1:- Glass Wool Before and After Fixing to the Vehicle

V. CONCLUSION: SOLUTION FOR POLLUTION

Capture C_6 is our invention (patent number 201941007595) which when introduced to our society reduces the particulate content in our environment and prevents many diseases like asthma, bronchitis etc The preparation of printing ink involves burning of non-renewable fossil fuels like petrol and diesel only for the collection of carbon particulates.

So our motive over here is to save the precious fossil fuels and make use of the carbon particulates that are present in the atmosphere as toxic substances for the preparation of ink.

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