A Review Paper on Design & Fabrication of Carbon Soot Collector & Ink Formation

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Abstract— Every time when fossil fuels burn they releases carbon dioxide. Major part of carbon dioxide in atmosphere is taken by the automobile exhaust. In natural way the carbon dioxide is re-absorbed by plants and trees. In current situation peoples are capturing carbon dioxide from exhaust pipes of large industries. But we know that the exhaust releasing from automobiles take part of 40-50% of total carbon dioxide in atmosphere. In India every year around 175 million vehicles get registered and the number get increased year by year. Carbon soot collection from automobile exhaust dose the job of collection carbon soot (in powdered form) from the exhaust outlet of vehicles. In this case truck and buses contribute large amount of carbon dioxide deposition. The carbon soot collector device is fitted at the end of the exhaust pipe, where it is fitted with clamps. After collection of soot from automobiles, this soot is then refined and treated with various types of methods to remove heavy metals and poisonous substances from it. This refined soot is then treated in labs with various chemicals and additives to create ink from soot. With the help of this we can reduce the pollution and reuse that pollution to create a useable ink or paints from it. There are some limitations while designing the collector device and in formation of ink or paints but with the application of this technique we have a better achievement point as well.

Key words: Exhaust Emission, Carbon Soot, Collector Device, Ink

I. INTRODUCTION

Pollution is becoming problem in environment. It is not exaggeration to say that the science and technological development had caused an uncontrollable changes in environment along with an increase in the pollution. Air pollution is define emission of harmful gases like CO_2, CO, HC, SO_2 and NO_X from the automobiles as well as industrial chimneys which is responsible for the human health as well as to the earth's ecosystem. In present scenario the exhaust emission from automobiles is becoming a serious problem to the environment. Automobiles majorly contribute in the emission of CO_2, CO and HC. Though the CO_2 available in atmosphere will be captured by oceans and ecosystem they are not able to control the CO_2 present in the atmosphere. Although the automobile industries trying to reduce HC and CO but they not sufficient to reduce.

No. of Motor Vehicles Reg. In India
(AS ON 31ST MARCH 2017)

YEAR	TOTAL VEHICLES
2010	127745972
2011	141865607
2012	159490578
2013	182445229
2014	190703971
2015	210023289
2016	230031090
2017	252354689

Table 1: No. of Motor Vehicles Reg. In India

II. LITERATURE REVIEW

1) (2014) S.Jenoris Muthiya[1] ,V. Amarnath[2] ,P.Senthil Kumar[3], S.Mohan Kumar[4] (Sri Krishna College Of Engineering & Technology,Tamilnadu) CARBON CAPTURE AND STORAGE FROM AUTOMOBILE EXHAST TO REDUCE CO_2 EMISSION
2) (2017) T. John Insidude Of Technology, Bengaluru EXHAST CARBON FILTER AND UTILIZATION
3) (2016) Mohd Umair[1], Abdul basit[2], Arun Prabhakar[3,] Anshul Gautam[4] MODIFICATION IN MUFFLER DESIGN TO REDUCE THE BACKPRESSURE
4) (2015) Munseok Choe[1], Chungyeol Park[2] And Dooseuk[3] FLOW ANALYSIS ON FORMATION OF BACK-PRESSURE IN EXHAUST SYSTEM APPLYING ELECTRONIC-VARIABLE
5) (2017) K N Balan[1] , T N Valarmathi[2], Mannem Soma Harish Reddy[3], Jammalamadaka K M[4], K Sai Srinivas[5], Vasan[6] ANALYSIS OF CO_2, CO AND HC EMISSION REDUCTION IN AUTOMOBILES
6) (2016) Anupam Mukherjee[1], Kunal Roy[2], Jayabrata Bagchi[3], Konika Mondal[4] CATALYTIC CONVERTER IN AUTOMOBILES EXHAUST EMISSION
7) David Dortmundt[1], Kishore Doshi[2] RECENT DEVELPEMENTS IN CO_2 REMOVAL MEMBRANE TECHNOLOGY
8) (2010) D S Deshmukh, M S Deshmukh, J P Modak EXPERIMENTAL INVESTIGATION OF THE EFFECT OF BACKPRESSURE ON AN INTERNAL COMBUSTION ENGINE OPERATING PERFORMANCE
9) (2017) Chris Philips, Awadh Al-Ahmadi, Sarah-Jane Potts, Tim Claypole, Davide Deganello THE EFFECT OF GRAPHITE AND CARBON BLACK RATIOS ON CONDUCTIVE INK PERFORMANCE
10) (2016) Anirudha Sharma

III. AIR INK BY GRAVIKY LABS

Carbon Soot Collection and Ink Formation: In this model the working system is a carbon collecting device, soot collector metal fibres and nets are used. This device is fitted to tail section of exhaust of automobile. This device is comes with veins that swirls the air flow through collector device to reduce the backpressure in automobile. After collection of soot from the collector, this soot is then refined and treated with chemical and additives in laboratory. This treated soot is then again treated with pigments and additives to create ink and also paints from that soot. This inks or paints can be used as writable ink or printing ink.

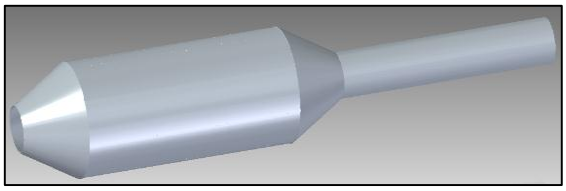

Fig. 1: Prototype of Soot Collector

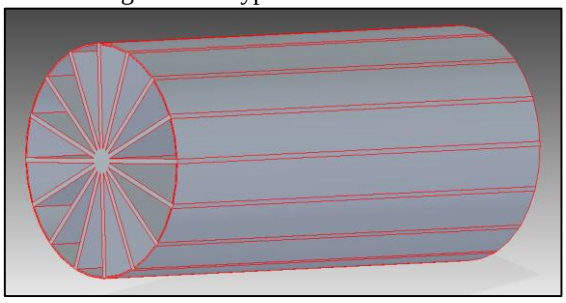

Fig. 2: Soot collector Prototype (Filter)

IV. APPLICATIONS

1) Harmful carbon soot is collected from exhaust of automobiles.
2) Carbon soot is chemically treated to reduce the toxic nature for formation of ink or paint.
3) Soot is used as writable ink or paint.
4) Pollution from automobile is reduced by large percentage.

V. ADVANTAGES

1) It is very helpful to reduce air pollution from automobiles.
2) Soot waste is then treated to create ink or paints which replace the conventional ink and paints.
3) Reduces carbon percentage in the environment.

VI. FUTURE SCOPE

1) Concept of use in automobiles for reducing pollution.
2) Concept recycling pollutant waste like carbon to create printing ink.
3) Easy to collect soot particle.
4) Creation of compact soot collector device.
5) Targeted Area in public transport system.

REFERENCES

[1] (2014) S.Jenoris Muthiya[1] ,V. Amarnath[2] ,P.Senthil Kumar[3], S.Mohan Kumar[4] (Sri Krishna College Of Engineering & Technology,Tamilnadu) CARBON CAPTURE AND STORAGE FROM AUTOMOBILE EXHAST TO REDUCE CO_2 EMISSION
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