

Study of Smoke Filter

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Abstract - In this seminar, filtration of smoke released from cigarettes and household chimney is been focused. The function of this smoke filter as the name suggests is to filter harmful smoke released. This filter takes in put as the harmful smoke and releases purified gases. There are no such devices introduce up to the date that can purify cigarette smoke. The smoke filter has a small opening that lets in the unfiltered smoke and a wide opening at the back to allow the smoke to exit .It is divided into six sections with four sections filled with smoke filtering in components. Many chemical reactions take place in those four sections. It comprises of an exhaust system, which allows easy suction of the smoke. This product can be installed in smoking zones and other numerous places. It will make sure that the health of passive smokers is not endangered. The construction and working of the smoke filter is discussed in this paper.

Key Words: Zeolite Bed, Camphor, Rhodium Matrix, Palladium Matrix, Platinum-Aluminium Catalyst, Exhaust System

I. INTRODUCTION

Youth generation, it is leading to a huge amount to fair pollution which is as we all know a leading problem since last 2 decades. There may or may not be a full stop towards cigarette smoking In today's generation cigarette smoking being a major addiction for people around especially among the of people but then problem of rising pollution must somehow ceased. This cigarette smoke not only affects active smokers but also in halation of this smoke by the people around can cause in halation problems to them and may lead to severe health issues. This second hand smoke or may lead to cardiovascular diseases, lung cancer, and other respiratory diseases. The greatest risks of health problems are concerned with children. Many smoke free laws have been introduced since. There is no compromise on the amount of smokers but a positive action can be taken regarding the quality and quantity of smoke. Hence, we have introduced a "Smoke Filter and an Absorb Can" which reduces the harmful nature of smoke by absorbing and few chemical reactions. Hence, we can have worked out on eliminating the chemical gases coming out of Cigarette smoke leading to low air pollution and thus reducing it sill effects on people around. In the era of industrialization and development the major focus on cause of air pollution are industries and automobiles. Somewhere, the minor causes such as pollution due to household chimneys, chemical reactions in educational institutes etc. are neglected. Here, we have focused on reduction of air pollutants released through the chimney. The causes that are dominant in air pollution by household means are-

- Gas-fired furnace, water heater
- Gardening
- Cooking in Kitchen

The major gases emitted include:

- Carbon monoxide and carbon dioxide
- Aldehydes
 - Unburnt Hydrocarbons
 - Nitrogen oxides
 - Sulphur oxides
 - Particulate matter

A. CONSTRUCTION

A) Smoke Filter and an Absorber Can (for cigarette smoke Filtration): The construction of this "Smoke Filter and an Absorb Can" is very simple and compact. The shape of this product may vary according to the use. Here, we have introduced a cylindrical shaped filter for user's convenience. The cylindrical filter consists of three layers and small space occupied by the exhaust. At the mouth of the filter can, an inlet is present so as the smoke enters in. The first layer consists of a zeolite bed followed by the second layer with powdered camphor. Third layer includes the presence of platinum aluminium oxide which works as a catalyst. It is followed by the empty space occupied by the compact exhaust system. A small motor is present (part of the exhaust system) at the outlet with exhaust blades connected to it. A battery placed inside/outside (according to convenience) with the purpose of supplying power to the motor. All the layers are in their powdered form.

B) Smoke Filter Head (for household air purification): "Smoke Filter Head" is designed cylindrical so as it can be easily fitted On the top of household chimneys. The inlet of this filter head is connected directly to the outlet of the chimney so as the gases are not released in to the atmosphere unfiltered. The cylindrical filter consists of five layers and small space occupied by the exhaust. The first layer consists of a zeolite bed followed by the second layer with powdered camphor. The third layer consists of a rhodium matrix and followed by the fourth layer with palladium matrix. Fifth layer works with the presence of platinum aluminum oxide .Here it speed speeds up the chemical reaction. It is followed by the empty space occupied by the exhaust system. A motor is present (part of the exhaust system) at the outlet with exhaust blades connected to it. An external power supply must be given to the motor of exhaust with the purpose of supplying power to the motor. The required power supplied to the exhaust system depends on the amount of smoke. All layers are in powdered form.

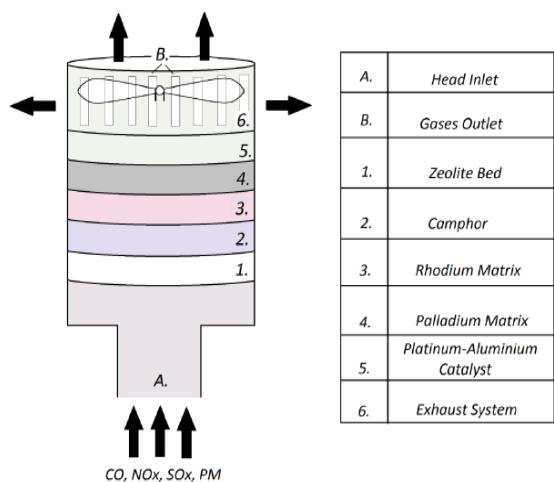


Fig1- Smoke Filter Head

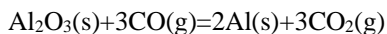
Earlier with accumulated technologies such as ignition system powered by Battery and coil introduced in the year of 1910 by Charles Kettering. In ignition system contact breaker is replaced by timer, operated by the electrically generated pulse.

II. METHODOLOGY

Working of Smoke Filter and Absorb Can can be explained as follows:

A) Zeolite bed: Zeolite bed is used to absorb the Nitrogen from N Nitrosamines and gives oxygen. Zeolite being porous in nature it can be used. Very efficiently here for adsorption purpose. Also the Hydrogen cyanide has property to get absorbed in a porous material, so hydrogen cyanide is also eliminated. As well as Zeolite is the best porous material so Aldehyde is also absorbed by zeolite. By using Zeolite we can eliminate the N-Nitrosamines, Hydrogen cyanide & Aldehyde consisting components from the smoke. B) Platinum Aluminum oxide catalyst:-Its function is to remove carbon Monoxide (CO) from the smoke. When Carbon monoxide reacts with Oxygen in presence of PT/Al2O3 catalyst, it gives Oxygen. This reaction causes oxidation of the carbon monoxide.(The oxygen required forth is reaction is obtained from Zeolite bed).

The reaction taking place is:



Removing unpleasant smell:-Smell is removed by using camphor or other fragrance. Burning of Camphor also gives out oxygen. Camphor being a sublime substance, it sublimes in to air when it comes in contact with hot smoke. Camphor smell is also good for health so there aren't no side effects. C) Exhaust system: It consists of 1 motor with a fan and a battery. It is used so as smoke could efficiently pass through the CAN. The use of this compact exhaust system creates pressure difference and hence partial vacuum is created. As a result smoke is easily sucked into the can without any difficulty. As per the requirement the exhaust capacity can be increased or decreased.

D) Can: This whole assembly is placed in a small 'Can' making this complete process fast and resulting in its compact size.

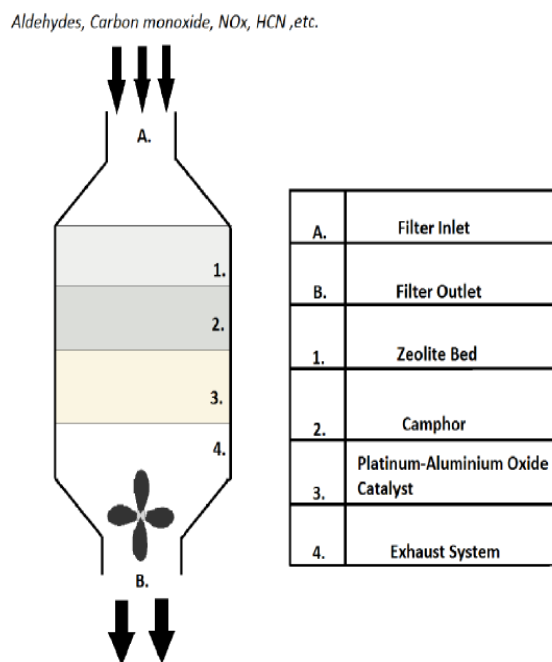


Fig 2- Smoke Filter and an Absorb Can

ADVANTAGES

This "smoke absorb can" will avoid direct inhalation of cigarette

- It reduces the unpleasant smell
- Simple in construction.
- It will filter the gases emitted directly into the atmosphere.
- Reduction in air pollution due to household chimneys.

APPLICATION

- Being very compact smokers can carry it anywhere to avoid passive smoking.
- It can be installed in every smoking zones so as to filter the harmful gases.
- It may be installed at general stalls.

RESULT

- The quantity of smoke at outlet is reduced as compared to quantity eliminated hence the smoke coming from the CAN has pleasant smell
- The contaminants from the smoke are eliminated in huge amount. Hence, there is less emission of harmful gases.

II. CONCLUSION

By using "Smoke absorb and filter can" we can also protect the health of non-smokers. Smoke of cigarette is dangerous than cigarette, so if we are reduce the Smoke then it's good for everyone. If smokers use this 'smoke absorb can' they can somehow protect their society and their mother environment.

Air pollution is reduced due to elimination of harmful gases. Thus quality of air is improved. These harmful gases are filtered causing less effect on environment as well as mankind.

III. REFERENCES

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