



Ultra Smoke Filter (Air Purifier)

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Date of Submission: 11-04-2024

Date of Acceptance: 25-04-2024

ABSTRACT

All the vehicles and industries which are running by the burning of the hydrocarbons are continuously adding carbon dioxide and other poisonous gases into the atmosphere as billions of tons every year.

This is a major problem before our industrial and mechanical progress. Auto vehicles are emitting billions of tons of CO₂ into the atmosphere continuously because these are consuming diesel and petroleum like hydrocarbons this is a challenging situation before our goals of sustainable developments, to overcome these obstacle this invention will be very much helpful to protect our environment from carbon emission the filter is not only able to filter out CO₂ but also other poisonous components which are added into the smoke hence it is very very useful to all the machineries, industries and auto vehicles.

Key words: sustainable development, poisonous components, obstacles.

I. INTRODUCTION:

Smoke is a combination of various components which are by products after the combustion of the hydrocarbons as fuels like petrol, diesel, coal etc these products are very harmful to the atmosphere some other harmful results of burning of these hydrocarbon fuels are like CO, CO₂, SO₂, NO₂, HNO₃, volatile organic and hydrocarbons.

In this practical a multi chambered smoke filter is developed this multi chambered filter filters out different components of the smoke from it and pure air is emitted out from the filter while all the impurities are absorbed by the smoke filter in its various chambers are reusable and washable also that means when smoke will pass through the chambers of the smoke filters these chambers will absorb respective impurities which are filled with various chemicals, fresh air will be emitted out. The residual parts of the smoke which are absorbed by the smoke filters will be removed out and also

these can be used in various different kind of purposes that means the harmful smoke will be converted into useful means.

All the harmful components of the smoke will be absorbed by the smoke filter and smoke will be absolutely pure and all the problems of the air pollution will be resolved which are generated due to the emission of the smoke after all mechanical activity like machines, industries, auto vehicles, power productions, and burning of coal etc.

II. LITERAL REVIEW

- a) Air filter technology.
- b) Water: Universal solvent.
- c) Organic Solvents.
- d) Ionic impurities.
- e) PPM Air quality.
- f) Air pollution.
- g) Global warming.
- h) Green house effect.
- i) Agenda-21
- j) Acid rain.
- k) ozone depletion.

a) Air filter Technology:

Currently this technology is in use, specially in all kinds of automobiles like bikes, cars, trucks, buses, etc also this technology is currently using in air filters like room air filters and air conditioners with the help of this technology heavy particles of the smoke are separated (filtered out) from the air. In this device at initial level this technology is also used. The basic job of the air filters is to separate out heavy smoke particles.

b) Water: Universal solvent:

Water is known as a universal solvent, because water is the medium which can dissolve the maximum number of the solutes within itself. The basic reason for this feature of the Water is its molecular structure.



The Water molecule is bipolar in nature. As a result it can attract approximately all polar substances. As a molecule Its polarity is highest. Hence it is known as the universal solvent. CO, CO₂, NO, NO₂, SO, SO₂, N₂O, HNO₃ LIKE impurities Of The smoke can be easily dissolved in water therefore a separate chamber is fitted with water as solvent.

C) Organic Solvents:

Some organic compounds which are not soluble in water but soluble in organic liquids. To separate out such impurities Of The smoke some organic solvents are used. Acetone, alcohol, ether, ethyl acetate, benzene, toluene like Solvents are known as Organic Solvents.

Li-compounds like impurities are dissolved in organic solvents.

To remove such impurities a chamber of organic solvents is used in ultra smoke filters.

d) Ionic impurities:

Some impurities which are cations or anions (negatively/positively charged particles) are known as Ionic impurities.

Some amphoteric surfactants have magnetic heads with two opposite charged ionic groups. Ionic impurities are further divided into two categories:

I-Cationic: (Ca, Mg, Na, K, Fe, Mn, Al) impurities.

II-Anionic: (Bicarbonate, carbonate, hydroxide, fluoride, chloride, sulphate, nitrates, phosphate & silica) impurities.

Even though maximum ionic impurities can be removed by water chamber still separate ionic chamber is used to filter out all the ionic impurities.

e) PPM air quality:

All the solid impurities are measured in PPM parameters. Atmospheric purity is decided with PPM (parts per millions) parameters.

As carbon emissions increase then the PPM index also increases simultaneously. Mostly in the industrial areas, colonial areas, busy work places air quality index rises PPM level. When PPM rises above to 5000ppm then it becomes hazardous to human health.

Hence PPM parameters for the measurement of the air quality index are very much helpful.

f) Air pollution:

Today air pollution is the most common problem before us. Smoke & carbon emissions are

continuously adding more and more problems to the environment. Hence it is a very tough challenge before us, how to overcome this problem. Ultra smoke filter May be absolutely helpful to our environment.

With the help of this technology more & more effective air filters can be designed than current air filters, Hence this technology is going to become very much helpful for air purification.

g) Global warming:

Due to over carbon emissions and continuous adding of Air pollutants into the atmosphere, it is going to become more and more harmful to the environment. As a result average global temperature is rising day by day resulting into the global warming, Such hazardous conditions can be prevented with the help of this ultra smoke filter.

h) Green house effect:

Just like global warming green house effect is also becoming more and more hazardous to the nature, It is also disturbing environmental balance of the whole earth, With the help of this technology when environmental pollution will be controlled Then such problems will be resolved.

i) Agenda -21:

This agenda is determined by the UN to solve environmental problems, For this purpose some goals of the sustainable development are decided by the UN, These goals are mentioned in the agenda 21.

This invention also will be helpful to achieve all the goals of the sustainable development determined by the UN.

j) Acid rain:

When some hydrochloric & sulphuric gases are added into the atmosphere Then Acid rain occurs. This acid rain is very much harmful for human health, to the vegetation and to the buildings also like tajmahal (in India) etc.

k) Ozone depletion:

When some harmful gases like CFC are added into the atmosphere Then ozone depletion is resulted, Ozone depletion is a major challenge before human health, This ultra smoke filter will also be helpful to control CFC like gases into the atmosphere Then ozone depletion like problem will automatically be solved.

III. RESEARCH METHODOLOGY:



The working system of the ultra smoke filter is based on the combination of filtration and solution processes for this combination four different chambers are used these chambers are filled with different types of observant/solvents they absorb or dissolve different types of smoke impurities these chambers systematically separate out harmful components of the smoke and filter out the pure air towards outside like wise the most polluted and poisonous smoke can also be filtered out. These filters can be of the various categories that mean from small to large sizes. Small filters can be used in motor vehicles while larger one sized filters can be used in the industries where huge amounts of the smoke is emitted out everyday, can be dissolved by ultra smoke filters and like wise the air pollution due to the burning of the hydrocarbons can be controlled.

The structure of the smoke filter is four chambered as follows:

- 1- CHAMBER -I (METALLIC FILTER CHAMBER):
- 2- CHAMBER -II (AQUATIC FILTER

CHAMBER):

- 3- CHAMBER-III (ORGANIC FILTER CHAMBER)
- 4- CHAMBER-IV (IONIC FILTER CHAMBER)

CHAMBER -I(METALLIC FILTER CHAMBER):

This is the very first chamber of the filter system which is filled with dense metallic sponge this sponge absorbs large size smoke particles that means directly impure smoke enters into the filter - I very first through this chamber and initially all larger smoke particles are stuck out then after remaining impurities passes to the chamber second through the passing tube that means now the process of observation will start in Chamber-II while in chamber-I the process of adsorption and absorption was done to filter out large size smoke particles when large size smoke particles are filtered out then smoke becomes free from dust particles only some poisonous fine impurities are remaining in the smoke which will filter out in the next coming chambers.



CHAMBER -II(AQUATIC FILTER CHAMBER):

This chamber is filled with water which is an universal solvent that means it dissolves maximum number of impurities which are found in the smoke, approximately 70 to 80% of smoke impurities are dissolved by water hence maximum impurities are filtered out in this chamber at a large scale and it is known as aquatic chamber only a

very few impurities can be remain in the air after this chamber which are either water insoluble or any other.

Water is polar in nature and in the semi ionic state hence also can dissolve maximum number of ionic impurities within itself, the water so what is the best chamber for the filtration of the smoke impurities.

The impure smoke inters into the chamber



It from chamber I through passing tube again after filtration into the chamber II it enters into the chamber III through the passing tube.

3- CHAMBER-III (ORGANIC FILTER CHAMBER):

The water insoluble impurities enter into the chamber III from chamber II through a passing tube and within this chamber organic solvent is present this organic solvent dissolves organic impurities. (these solvents can be turpentine, Acetone, benzene, TFH, chloroform, acetic acid etc)

When smoke enters into the chamber III then approximately 95-99% of the impurities are dissolved now the smoke air is approximately pure.

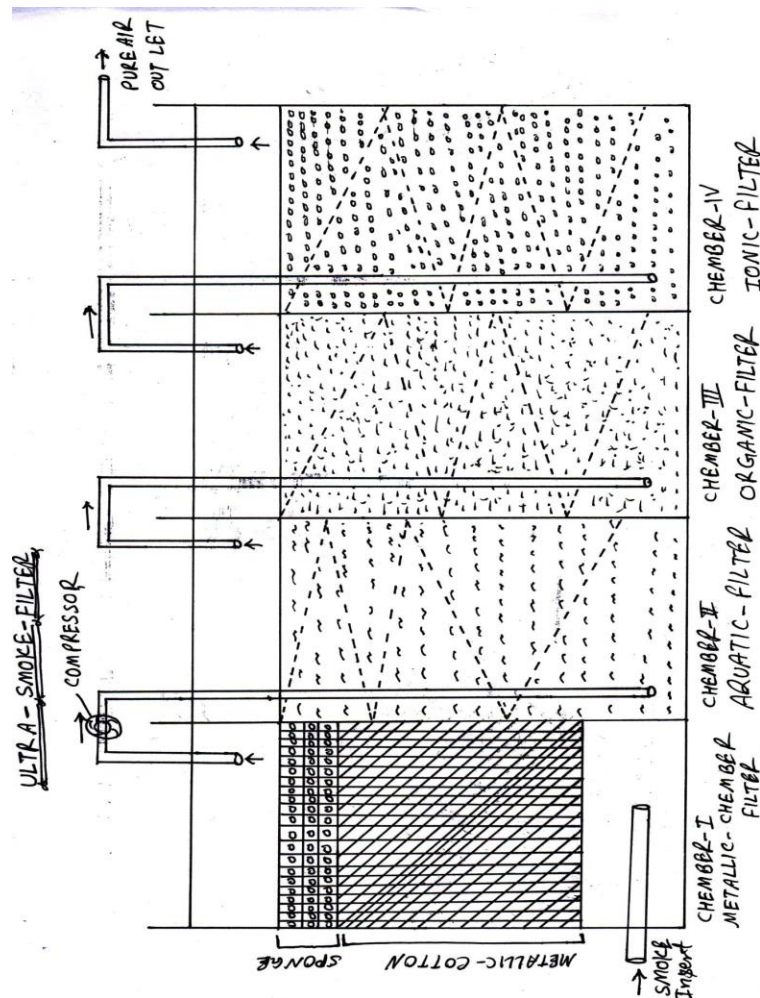
4-CHAMBER-IV (IONIC FILTER):

Some important impurities of the smoke which

are still unfiltered like ionic impurities which may be poisonous also, so the removal of these impurities is essential from the air now to remove these impurities chamber IV is used which is known as ionic filter chamber this chamber is filled with ionic Solvents, this ionic solvent may be a solution of sodium chloride or hydrochloric acid now when ionic impurity passes through this number, can be dissolved by this ionic solution, Therefore approximately for complete filtration ionic filter chamber is essential, Now when the impure smoke was entering into the ultra smoke filter through the chamber first is now in the purest form after existing out from the chamber-IV.

THE COMPRESSOR:

At the connecting point to the first chamber and the second chamber a compressor is fitted to compress the smoke air to forward chambers.





IV. RESULT:

After complete experimental observations it is concluded that this technology is showing few results as follows:

- a) Larger/heavier smoke particles are absorbed by the chamber I.
- b) Maximum impurities Of The smoke which are water soluble are dissolved within water (chamber II).
- c) Organic soluble impurities are dissolved in the organic solvents(chamber III).
- d) All ionic impurities are dissolved in the ionic solutions (chamber IV).
- e) All poisonous impurities are dissolved in the chamber II, III, & IV respectively.
- f) Approximately 99.99% smoke impurities are filtered out through an ultra smoke filter.
- g) Such smoke filters can be developed into various designs & sizes according to the requirements like in the bikes, cars, motors, trucks, buses, industries etc.
- h) Fig. 1st is the diagrammatic presentation and 2nd is the practical (pictorial) presentation of the ultra smoke filter, which is 100% successfully working & completely purifying the smoke.

V. CONCLUSION:

- 1: The poisonous smoke of all the vehicles and industries (which are using hydrocarbons as fuel) will be purified with the help of this ultra smoke filter.
 - 2: Every year billions of the tons of the carbon and poisonous gases would be avoided to be added into the atmosphere.
 - 3: Air pollution, global warming, greenhouse effect, acid rain like environmental problems can be easily solved with the help of this ultra smoke filter.
 - 4: All the Chambers of the ultra smoke filter are reusable after servicing (cleaning/washing), these chambers will collect the smoke impurities during absorption as residual parts, these impurities may be used as by products into other purposes like smoke ash, tar etc.
- Therefore the harmful poisonous gases of the smoke can be converted into useful purposes with the help of this ultra smoke filter.
- 5: This technology will be fully helpful for achieving the sustainable goals of the development determined by the UN.
 - 6: After using this technology the industrialisation will not be harmful to the environment that means all the technical

developments will become eco-friendly.

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