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Air Purifier Machine

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Abstract –

As we live in 21st century an age of industries. Industries means machine and machine means pollution of air. This machine together with automobiles on working release various types of gases, may of them like carbon mono-oxide, carbon dio-oxide, nitrogen dio-oxide, sulphurdio-oxide, are very harmful. This gases are also known as greenhouse gases. This gases leads to pollution of air. According to an survey approximately 35-40% of air used for respiration is been polluted. It causes harm to human health like lung cancer, nosal cancer, etc. so for human being to live a long life we must concentrate on the problem. But as we know we are unable to work on the reduction of no of industries and automobile, but we can control air pollution. According to this we are making a 'AIR PURIFIER' naming "SURAKSHAYANTRA" (protecting instrument) to increase life.

Key Words: Air tank, Fans , Filters, Pipes and Base……Section Break (Contnuos)…….

1.Introduction

According to survey there is 40% increase in the atmospheric concentration of carbon from 280ppm in 1750 to 416ppm in 2017. This has been achieved due to human activities since the begning of industrial revolution (around 1750). It has been estimated that if these harmful gases emission continues the earth surface temperature could exceed its historical values. So the project is for living beings as the name "SURAKSHAYANTAR" itself defines that it protects living beings life and increases the life period from 60 years to 80 years.

2. Scope and Objective of the Project:

"SURAKSHAYANTRA" mainly focuses on the reduction of harmful gases from the atmosphere gas. The machine has capability to reduce about 70-75% of total presence of harmful gas from air. The main objective of the machine is to enhance the purity of atmospheric air to make it comfortable for respiration. The project has capability to reduce health problems up to 80% since it purifies the air to a 75%.

3.Importance Of Project

The project is very much important in reducing the content of harmful gases from atmospheric air and making air very much purified for the respiration purpose. It also controls the increment of carbon amount in air. It is very important in the aspect of environment as it also controls the global warming. As the content of sulphur and nitrogen also reduces the content of oxygen in the air automatically increases.

4. Literature Review

- Here, we are designing air purifier machine which can purify air in order to
  do this work we have undergone by various author as followed:-
- Guoliang liu and Derek clements has presented a comprehensive review on the synergistic effect of different air purificationtechnologies.

- Roger W. Fork and MD Tampa has presented a review paper on increment of indoor air quality by the filteration of harmful contaminants fromair.
- GaurawBalpande together with his team members has presented a comprehensive review on the automatic air filter cleaningsystem.
- Sulay N. Patel together with his team member presented a comprehensive review on the effect of air purifier on the performance of four stroke gasolineengine.
- Marius Tama and IordanaFileru has presented a comprehensive review on the maintenance of airfilters

5. Design

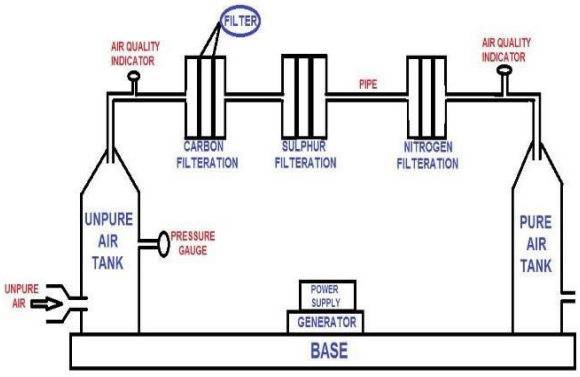

Fig.1 Air Purifier Machine

The above figure represents the layout of the air purifier .

5.Parts

The varius parts of the machine are as followed:-

5.1 BASE

Base is a platform on which all the parts of the machine are mounted. It is made up of wooden block. It has the length of 1.5 meters and width of 1 meter

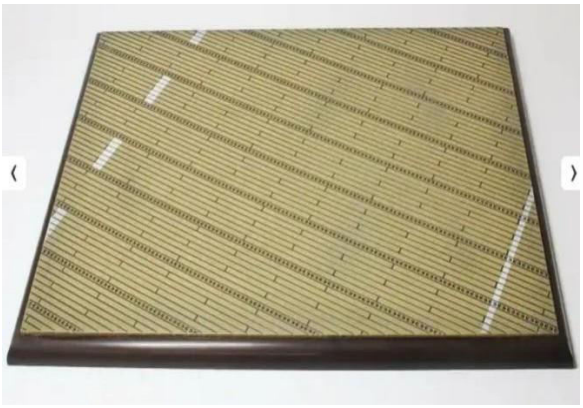

Fig.3 Wooden Block

5.2 Air Tank

Air tank is used for the storage of the air. It is made up of painted iron sheet to avoid corrosion. There are two tank one for the pure air and another for the unpure air. The tank approximately is 1 meter long and have a diameter of 60-70cm.

Fig.4 Air Tank

5.3 Pipes

Pipes are used for motion of air from one point to another point. Pipes are also madeup of painted iron sheet to avoid corrosion. It also provides strength to the system. The diameter of the pipe is about 5-6 cm.

Fig.5 Pipes

5.4 Fans

Fans are used to suck impure air from atmosphere, motion of air from one point to another point and for the removal of pure air from the system. The fan used are simple mini fan on the 12 volt supply and has speed of 200 rpm.

Fig.6 Fan

5.5 Air Quality Indicator

Fig. 7 Air Quality Indicator

It is a device to determine the quality of air. It represent the amount of Carbon, Nitrogen and Sulphur present in the air before and after the filteration chambers.

5.6 Filters

Filters are used to remove the harmful gases like Carbon, Nitrogen and Sulphur from the air. It converts impure air into pure form of air.

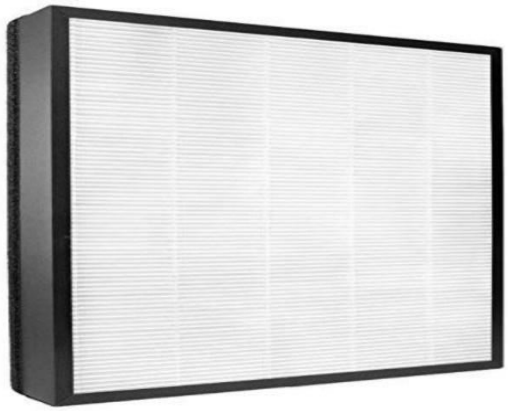

Fig.8 Filters

6. WORKING OF AIR PURIFIER

The air purifier works in the following steps:
The atmospheric impure air is admitted into the device by using a fan and by opening the inlet valve. The amount of air admitted is known since the discharge capacity of the fan is already known. The admitted air is then directed by the pipes to the inlet air storage tank. The air is then stored in the tank. The storage of air is necessary because if the air with considerable velocity is allowed to directly interact with the filters, it may damage the delicate membrane of the filter.

In this step the filtration process takes place. After reducing the speed of air by storing it in the tank, the pipes direct the air to the filters attached.

Here we have attached three filters-

- Carbon filter
- Sulphur filter
- Nitrogen filter

Each of the above mentioned filters separate the different particles. The air is first taken to the carbon filter which is a HEPA Active charcoal based. It removes the carbon particles from the air. The oxides of carbon like carbon dioxide (CO2) is one of the main contributors to the greenhouse effect or the global warming. The other oxide which is very dangerous is the carbon monoxide (CO). It causes skin related, eye related and respiratory related diseases.

After this the air is taken to the next filter which is the Sulphur filter. Since, we know that atmospheric air is contaminated by oxides of Sulphur which is mainly generated from the industries. The oxides of Sulphur like SO2 gets mixed with the water vapours which causes acid rains. These acid rans are responsible of various health related dangerous problems like Skin cancer, retina damage etc. The acid rains are also responsible of yellowing of the white marble of the Taj Mahal. Thus, the purification of air from Sulphur becomes necessary. This is done by using Sulphur filters.

After the air is purified from the carbon and Sulphur particles, nitrogen which is about 79% of the atmospheric air. This 79% also consists of oxides of nitrogen which just like the oxides of carbon and Sulphur are dangerous for human health. After the Sulphur filter air enters the Nitrogen filter chamber and all the oxides of Nitrogen starts getting filtered and after the puAfter removing the maximum amount of impurities, a pure air is obtained. This contaminant free air is again stored in another storage tank called the outlet storage tank.

This is the final step of the air purification process of this machine. The outlet valve is opened and the purified air from the tank is exhausted into the atmosphererification of all gases the air becomes pure.

7. Conclusions

From the above work we conclude that the amount of Carbon, Nitrogen and Sulphur from the air get reduced to about 70- 80%. The air gets purified for respiration. We also conclude that since the machine is fully automatic so it can be easily controlled by unskilled labour. At last it is concluded that the machine helps living beings in better living in the environment.

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