



Air Pollution Control Device: Air Pollution to Ink

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Abstract –

Pollution became as dangerous as disease, so pollution traps and smoke absorbers were developed to control it. Advanced pollution control devices are also being invented. So that we can control pollution and keep it safe. In the future, it will be mandatory to have a smoke absorber in every house. A pollution trap not only keeps your surroundings pollution-free, but can also prevent diseases. Advanced pollution catcher equipment makes it easy to get rid of pollution without wasting human energy.

Key words: Pollution Control, Smoke Absorber, Air Ink.

Introduction

It is a device that filters the air in the interior and removes vapours and particles in the air created during metal soldering. This helps maintain better indoor air quality. Removes solder fumes, heat, noxious odours and other airborne particles that could have adverse health effects.

It comes with a mechanical fan that extracts all toxic fumes, bacteria, gases and particles through a carbon filter. A smoke absorber plays a key role in removing fumes and harmful gases.

Having a smoke absorber with a built-in fume extractor is important because of the hazards & health effects of solder fumes. It is necessary to have one in areas reserved for industrial/mechanical tasks that create hazardous fumes and smoke.

Recycling environmental air pollution and convert it to paints/ pigments and printing ink. Firstly, AIR INK products were used in August 2016 in association with Tiger Beer to create art. Founded by Graviky Labs, a spin-off group of MIT Media Lab. Kaalink is a contraption retrofitted to the exhaust pipe of vehicle to capture the outgoing pollutants. This does not affect vehicle performance. [1]

Inhaling fumes while soldering can lead to dangerous health consequences due to toxic metal particles in the fumes. Unfortunately, few people are aware of this risk because most believe that opening the windows or turning on the fan will solve the problem. Unfortunately, fans will only circulate the smoke to other areas, increasing the risk of exposure to harmful toxins.

Even opening the windows does not help, because the outside air pressure is greater than the air pressure created by the fan. As a result, some smoke returns to the room. Fortunately, new inventions in workplace safety are making it easier to absorb smoke to improve indoor air quality. Smoke absorbers are a great example of an efficient solution with a carbon filter and smoke exhaust fan.

A smoke absorber is a mechanical device that absorbs smoke from a closed environment. some common places where smoke absorber is used are kitchens, factories, laboratories, etc... Smoke absorbers are used to extract

smoke, odour, hot air and other toxic air from an enclosed environment. This article is written with a vision of utilizing resources that have been ignored until now. Air pollution can be harvested and made into a substance as useful as ink. The Smoke Absorber is a device that smartly detoxifies heavy metals and carcinogen particles from soot or carbon. Pollutants that can damage our lungs can reach our eyes in the form of art.

Unburned carbon particles from industries, chimneys are more than just smelly and unsightly. They can adversely affect health leading to shortness of breath, asthma, stroke, cancer, heart attack, bronchitis and premature death.[2] Over time, technology has proven that substances that cannot be touched can also be recycled and reused in the form of ink. It is an extension of technology to create an environmentally friendly environment. This developed idea combines science, technology and art. Polluted air is rich in carbon due to the burning of fossil fuels. The proposed device is designed as a smart and smart combination of electronic sensors, collection system and mechanical actuators.

Current Scenario

The past few decades have seen massive production of ink by burning large amounts of fossil fuels. This article aims to preserve our reserved resources and thereby protect nature. In addition, a large number of harmful gases are released into the atmosphere. Soot is even thinner than the diameter of a human hair and can easily enter our bloodstream and lungs. Vehicles, chimneys and ships serve as the main source of soot formation. In addition to affecting the environment, it can also deform human organs. Research has claimed that carbon black can be cleaned and used for a variety of purposes. One of the main applications where this unburned carbon can be used is the production of air ink

During the last 150 years, humanity has been dependent directly or indirectly on burning fossil fuels for its energy needs.

Particulate matter exposure leads to approximately 20,000 premature deaths in America each year. The data also shows that soot causes nearly 300,000 asthma attacks and 2 million lost work days due to respiratory problems each year.

The production process of Air-Ink not only eliminates the soot that pollutes the air, but also does not burn additional fossil fuels than in the production of conventional ink.

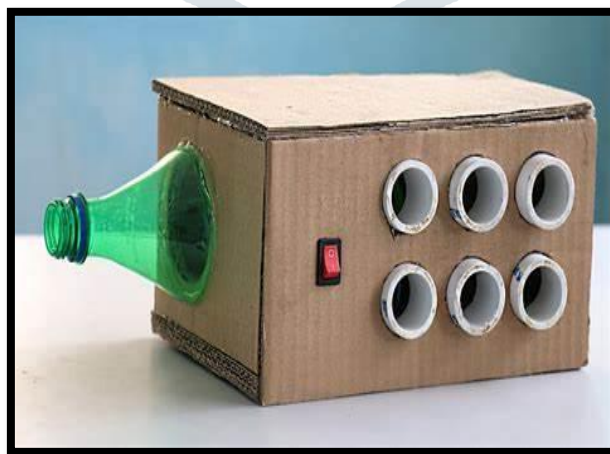
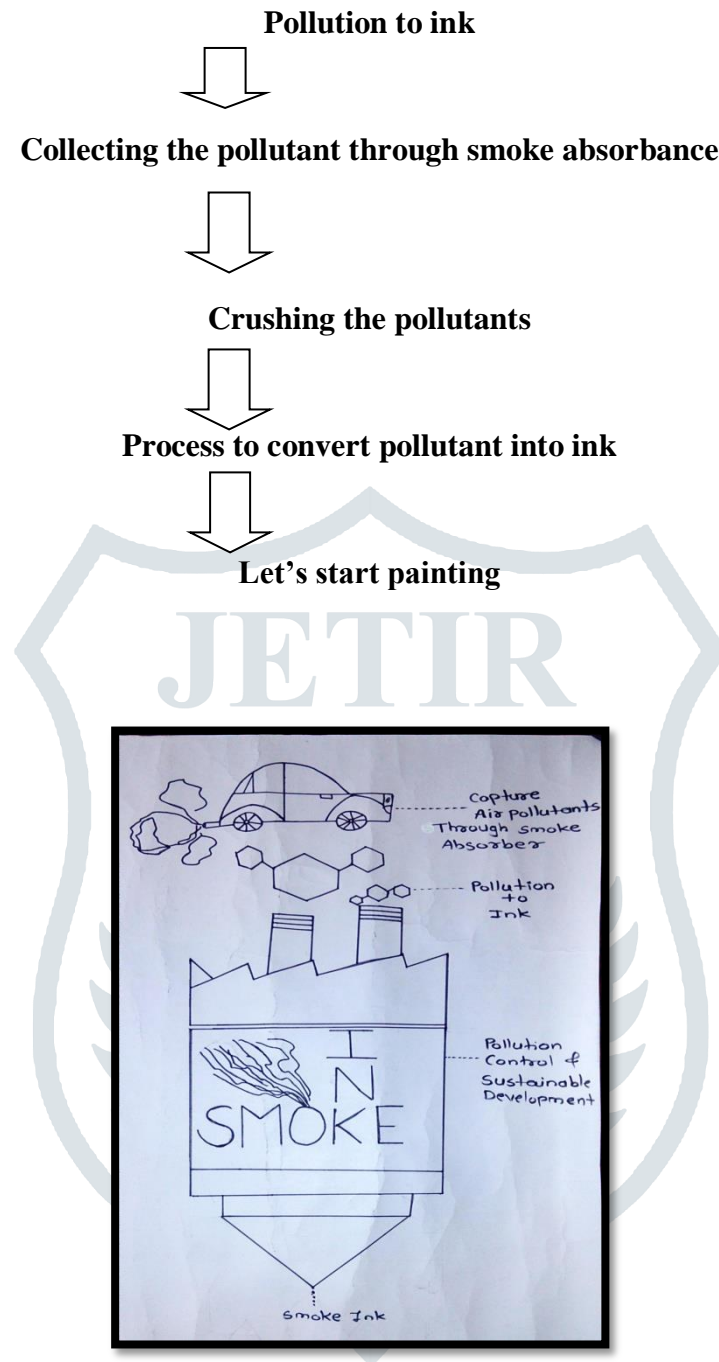


Fig-1: Smoke Absorber

Materials and Methods

The present study was conducted at CSIBER Trusts CNCVCW, Kolhapur during the year 2022-23.



Device Description and Ink Preparation

- The waste plastic bottle is used for this project. The plastic bottle is connected with the exhaust fan for the working of exhaust fan DC motor is connected to the fan. The below part is applied with the petroleum jelly.
- The exhaust fan placed at the front of bottle. When the unit is started the harmful air pollutants/smoke is absorbed through the exhaust fan and passed towards the petroleum jelly wall. The collected sample is crushed into mortal pestal to get fine powder of it.
- The fine powder is then mixed with alcohol and mixed well. This mixture can be used as a primary ink.

Device Performance

The whole process of manufacturing the smoke ink and absorbing the soot from polluted air makes it environmental friendly and carbon-neutral. It captures more carbon emissions than usually required to produce ink. Smoke ink is better than regular black ink since it doesn't burn extra fossil fuels. The developed ink is better,

thicker and darker than the traditional ink. Carbon dioxide will still reside in the air but the proposed device will try to reduce the level of carbon soot which is the reason for pollution called PM 2.5. Smoke ink is used to capture soot which is then processed to make air ink. The unit captures 75% of particulate matter without inducing back pressure.[2]

Smoke Absorber Use:

1. Harmful chemical gases will be removed from the air
2. The environment is kept safe and clean thanks to a smoke absorber that removes harmful chemical gases.
3. Different types of filtrations
4. There are various filter devices available in the market, we have the best filter device which is the most effective activated carbon filter that absorbs fumes, harmful smoke and strange odours.
5. Protect the respiratory system
6. A smoke absorber can be a very effective and useful device to help prevent respiratory problems. It extracts harmful fumes far from the surrounding environment and keeps the air clean and breathable.

Observation:

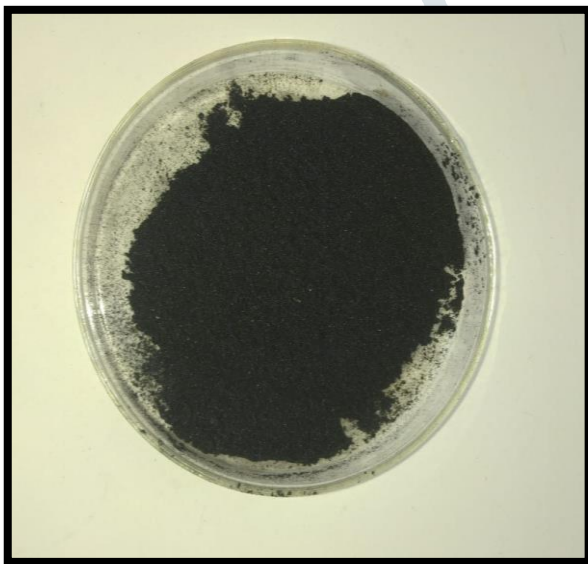


Fig: 2 Sample collected from Smoke



Fig: 3 Primary ink Preparation in Laboratory

Result and Conclusion:

smoke absorption machine is a type of machine that has its own function to save the environment by reducing the air pollution that comes from the open combustion process. while for open burning process it means that the smoke that comes from open burning process does not have heavy particles in the smoke compared to industrial smoke

If this idea gets the recognition and recognition it needs, it can work its way to releasing oil paints, textile paints and other outdoor paints and many more. Even if a replacement for fuels such as gasoline and diesel can be found, it will certainly take several years. The ink produced is not edible and has not yet been determined to be safe for children.

In conclusion, the goals of this machine can reduce air pollution and smoke absorption machine have been achieved, and they can be used especially in personal home.

References

1. <https://en.wikipedia.org/wiki/Air-Ink>
2. Swastika Thakur, Shruti Sindhi “Device Turns Air Pollution into Ink” in the International Journal of Innovative Science and Research Technology Volume 4, Issue 8, August – 2019
3. <https://www.fastcodesign.com/3067701/this-mit-spinoff-turns-car-exhaust-into-super-black-paint>
4. D Mohan Kumar, “OP AMP based Fume detector and Controller”, EFY publications, volume 24, November, 2007
5. <http://www.businessinsider.in/an-mit-startup-made-a-simple-device-that-turns-filthy-car-exhaust-into-beautiful-ink/articleshow/57155874.cms>
6. <http://www.huffingtonpost.in/2016/08/21/this-start-up-claims-to-be-recycling-polluted-air-to-make-ink-an/>
7. <http://www.psfk.com/2017/02/startup-turns-carexhaust-into-artful-pen-inks.html>
8. <http://www.citylab.com/tech/2016/03/the-innovativeways-people-are-recycling-air-pollution/471999/>
9. <http://www.livemint.com/Leisure/QtAfbCh9RYN5aZ R9V6CdyI/Graviky-labs-When-soot-turns-to-ink.html>.

