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RESEARCH ARTICLE

Design and Development of Portable Incinerator.

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Abstract

It is wheel based incinerator for waste disposal of houses, colleges, and small industries. It can be designed and fabricated. It can be used to convert waste into energy source at household level. The fabricated part consists of a barrel, chimney, wheel base, pipe, electrical system, ash tray and insulation. The main function is portability of incineration which can be also used as dust bin. The compactness can be deigned on application of incinerator. The incinerator needs heat supply for heat treatment on waste. Different incinerators can be designed depending upon the state of waste. This can help to reduce the solid lump of waste which occupies more space. The emission of harmful gases is less than other energy sources. It reduces the waste into ash which is easier to dispose.

Introduction:-

Incineration is a waste treatment process that involves the combustion of organic substances contained in waste materials. Incineration and other high-temperature waste treatment systems are described as "thermal treatment". Incineration of waste materials converts the waste into ash, flue, and heat. The ash is mostly formed by the inorganic constituents of the waste, and may take the form of solid lumps which are carried by the flue gas. The flue gases must be cleaned of gaseous and particulate pollutants and only after that it can be let out into the atmosphere. In some cases, the heat generated by incineration can be used to generate electric power.

Incineration is one of those energy recovery systems such as gasification. While incineration and gasification technologies are similar

In principle, the energy product from incineration is high-temperature heat whereas combustible gas is often the most important energy product from gasification. Incineration and gasification may also be implemented without energy and materials recovery. In few countries, incinerators were built just a few years ago and often did not include materials separation to remove dangerous big and recyclable materials before combustion. These facilities affected the health of the plant employees and the local environment due to improper methods of gas cleaning and control of combustion process . Most of these facilities failed to generate electricity.

Incinerators reduce the solid mass of the original waste by 80–85% and the volume compressed by 95–96%, depending on composition and degree of recovery of materials such as metals for recycling. This means that while incineration does not completely replace landfilling, it definitely reduces the required volume for disposal. Garbage trucks often reduce the volume of waste in a built-in compressor before supplying it to the incinerator. Alternatively, at landfills, the volume of the uncompressed garbage can be reduced by approximately 70%by using a stationary steel compressor, albeit with a significant energy cost. In many countries, easy ways of waste compaction is a common practice since a long period of time.

Incineration has specifically large benefits for the treatment of certain waste types in niche areas such as clinical wastes and certain hazardous wastes where pathogens and toxins can be destroyed by high temperatures. Examples

include chemical multi-product plants with diverse toxic or very toxic wastewater streams, which cannot be routed to a conventional waste water treatment plant.

Process:-

The solid waste is connected in the hopper which is connected to drum. The curing is required at the start of process for burning. After curing, the solid waste is introduced in furnace. The heat is transferred to the heat junction of thermopile which are connected in series around the drum. The cold junction is in the dome where it is connected to bulb to see power output. The pollutants created in the furnace goes through oxidation and reduction in catalytic converter. The catalytic converter stops the fly ash to pass through it and maintains the heat in furnace. The chimney is used to path the exhaust gases to atmosphere. The trolley is used for transportation purposes where it can cover more ground.

Methodology:-

Barrel:-

This in main unit of incinerator where heat treatment will take place on waste.

Chimney:-

It is exhaust for gases and is attached to barrel.

Wheel base:-

It helps in portability of incinerator.

Electric Supply:-

It is connected to coil in barrel which generates heat of high temperature.

Pipe:-

It is connected with air stream and chimney to reduce the polluted gases.

Insulation:-

It is provided in barrel so it does not affect other parts on incinerators.

Ash Tray:-

It collects the waste ash in it for easy removal.

Conclusion:-

The development of such portable incinerators can lead to reduction of waste and form of energy source. It can replace dust bins on small scale and the cost can be matched with energy produced. The pollution is less compared to other energy sources. It can be shifted from one place to another or can be stationed at one place.

One great advantage to be derived from the use of this machine is that the cost of running it is minimal compared to what it takes to run a full plant. The simplicity of operation of this machine ensures that no too much technical skill is needed to operate it.

When the machine is well maintained, its durability is guaranteed

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