1. **Project Title:** Development of Bio-Medical waste Incinerator by using Electromagnetic Induction.

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5. **Keywords:** Burning of bio medical waste, Electromagnetic Induction.
**Introduction:** The improper management in bio-medical waste causes stern environmental problems that causes to air, water and land pollution. There are several legislations and guidelines in India concerning environmental problems, which can be addressed. One of the causes for the increase in infectious diseases is improper waste management. Blood, body fluids, and body secretions which -are constituents of bio-medical waste harbour most of the viruses, bacteria, and parasites that cause infection. The effect of medical waste on human health and on the environment are astronomical. It could cause severe illness or even death.

Urban air pollution due to open incineration of municipal waste or incineration in systems without or with only poorly designed flue gas cleaning systems results in a serious health risk. Another big problem is uncontrolled landfill fires and open burning on the streets and the groups of people at the highest risk of such encounters are health-care staff, rag pickers, and scavengers, municipal workers, and the public. Several ways in which medical waste pose dangers to the public. Uncontrolled burning of waste continues to be practised in developing regions, causing the release of CO₂ and other greenhouse gases. Health and Ecological Effects of Burning Medical Waste incineration results in the release of extremely harmful pollutants such as dioxins... Highly toxic, dioxins can cause reproductive and developmental problems, damage the immune system and interfere with hormone.

According to the WHO, the global life expectancy is increasing year after year. However, deaths due to infectious diseases are increasing. A study conducted by the WHO reveals that more than 50,000 people die every day from infectious diseases. Ensuring safe public health and a clean environment in the face of improper medical waste disposal is of great significance. In India this could range from 15% to 35% depending on the total amount of waste generated. The management of bio-medical waste is still in its infancy all over the world. There is a lot of confusion with the problems among the generators, operators, decision-makers and the general community about the safe management of bio-medical waste. The reason may be a lack of awareness.

Induction heating is a process of contactless heating of an electrically conducting object by Electromagnetic Induction, through heat generated in the object by Eddy currents. Thermal process employing the combusting of waste under controlled conditions. This generated heat is used to burn the Bio-medical wastes instantly.

**Scope / Objectives of the project:**

1) The Induction system will reduce the power consumption.

2) The design of incinerator is inexpensive.

3) It is 60% cheaper than L.P.G.

4) Induction system will burn the product inside the vessel without transferring heat to the vessel.

5) Less smoke is produced by using this method, so it is Ecofriendly.

6) It is more efficient compared with other heating methods.

7) Burning of many bio-medical waste like sanitary napkins, diapers, blood soaked cotton etc may result in the contamination of bacteria that can spread to humans, thereby causing an epidemic and infecting a large number of people this can be prevent with the help of a closed burning of bio-medical waste by using this system.
Methodology:

Bio-medical wastes:

Fig: Smoke produced by burning of Bio-medical waste
Health and Ecological Effects of Burning Medical Waste incineration results in the release of extremely harmful pollutants. The hazardous waste so obtained is detoxified by subjecting to the induction system which is gaining popularity as a disposal technology in the field of hazardous waste management

Construction and working:

Fig: Bio-medical waste Induction system
Bio-medical waste Induction system works on the principle of Electromagnetic Induction. This system consists of Alumina, Ceramic graphite, Blower, Copper coil, Asbestos, PCB and Tray. Copper wire is wound on Alumina tube having an inner diameter of 85mm and an outer diameter of 90mm. Ceramic graphite is placed inside the Alumina tube having an inner diameter of 45mm and outer diameter of 75mm. The two Blowers are placed on either side of the Alumina tube.

Working:

Power supply delivers current (I) to the copper coil. Coil currents generate the Magnetic field. The alternating magnetic field flowing through the part cross-section induces voltage in the part. This induced voltage creates Eddy currents in the part flowing in direction opposite to the coil current where possible. This Eddy current generates heat in the part. Asbestos is used as an insulating material. The Bio-medical wastes are treated from the top of the system will directly come inside the Ceramic graphite tube. Due to the heat produced by the Eddy currents, wastes are burnt inside the Ceramic graphite tube. PCB is used to control the power supply load. Blowers are used to cool down the Induction system. We can deliver up to 2kw power to this Induction system. Finally
The ash is produced within a fraction of second and it is collected below the system by using a Tray. By providing a closed container in which bio-medical waste such as bandages, napkins, and other cotton wastes are burnt with the help of this system and these burnt waste are converted into ash thereby resulting in reduces the pollution and also does not any affect on human beings.

9. **Conclusion:**

It is concluded from the experimental result that, Bio-medical wastes burn with less smoke at high temperature instantly by using Electromagnetic induction. Therefore instantaneous burning is necessary to burn the Bio-medical wastes that reduces smoke and emissions of CO-96.47%, CO₂-95.89%, NOₓ- 95.65% and Hydrocarbons- 95.56% compared to open burning.

It is also observed from the experiment that the generation of smoke decreases gradually by increase in the time of Induction heating.

1. Induction method of burning the waste is more efficient than other types of heating as it produces less smoke into the atmosphere.

2. Reduce Power consumption

3. It is Ecofriendly.

3. Presently, the Napkins were thrown into the Commodes. Because women were shy to throw it outside. So these napkins will block the commodes passage. These problems were prevented by using this system.

10. **Scope for future work:** In large scale this system can be used in Industries to burn more quantity of wastes.