A New Efficient Adsorption Device for Automobile Exhaust Particles

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Inspired by the pollution caused by automobile emission, this project provides a new efficient adsorption device of automobile exhaust particles. The device primarily consists of three sections: high voltage ionization section, dust collecting section (containing a dust detaching unit exploiting ultrasonic vibration) and dust collecting tank. The ionization section is designed with a honeycomb structure that contains non-conducting ionization tubes with heat-resistant. The number of tubes is determined based on the engine displacement and its combustion efficiency. Each ionization tube is copper plated on the outer surface, with a high voltage wire passing through the inner tube. The electric field is generated by exerting high voltage to the wires. The dust collecting section is made by placing an ultrasonic vibration plate in between two alloy steel metal pieces. Exhaust from the vehicle's inner emission system travels through the ionization section and forms high energy oxidative ions, which will oxidize toxic gas into nontoxic compounds and reduce pollution. Meanwhile, the exhaust particles acquire absorbability after passing through the ionization section and are attached to the inner surface of the dust collecting section. The particles are then detached and collected in the dust collecting tank by periodically activating the ultrasonic vibration plate automatically. This device supplies compacted structure, large exhaust handling capacity and high efficiency etc.

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