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Homework 1

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"I pledge my honor that I have abided by the Stevens Honor System"

Kinetic Self-charging Battery for Automobiles

Observed Problem:

Often times we see cars or motorcycles run out of battery power because we forget to bring them to the auto-shop for repair and maintenance and get the battery charged or refilled. It would be frustrating for automobile owners when they could not get their vehicles turned on before they get to work in the morning. Sometimes some people are too busy to get their vehicles checked out and serviced. Apart from that, there is also the problem of the battery running out of power due to excessive usage of the battery power for audio playing and charging mobile phones. So I figured out that a self-charging battery mechanism would solve these problems.

General Idea:

The fundamental idea for this system is to solve the problem caused by dying battery power in an automobile, let it be cars, trucks or motorcycles. The purpose of the system is to provide a continuous source of battery power to the automobiles. The self-charging battery will have a small dynamo or electrical generator that utilizes the rotating axle of the automobile. The kinetic energy from the rotation of the axle of the automobile will generate electricity that would continuously recharge the battery of the automobile. This mechanism will ensure that the battery power of an automobile will not run out.

Suggested Implementation:

The system is universal as it can be implemented in a wide variety of vehicles. Thus, the installation of the system will vary from different brands and models of vehicles. The main battery will be a rechargeable battery. However, considering a typical automobile to have a rotating axle to drive the wheels, the following set up will be used:

- The main battery of the automobile will be coupled with a small dynamo or electric generator that will then be connected to the rotating axle of the automobile. The electric generator will utilize the kinetic energy produced by the rotating axle. The generated electricity will then be stabilized and filtered before being charged back onto the main battery. This will ensure a constant flow of electricity for a constant recharging as long as the axle is rotating. During a long travel by the automobile, it is possible that the battery will reach its maximum charging capacity thus the system will take that into consideration. Once the battery reaches its peak charging capacity, the system will automatically stop the charging process. Customization can be made to the system as to what capacity of the battery; the system will start charging the battery again by setting a threshold amount of power left in the battery.
- Since different automobiles have different configuration of generating kinetic energy, different automobiles will utilize different set-ups as long as the battery is using a kinetic mean to charging itself. For example, a vehicle not using an axle system to operate can use a battery that will utilize the rotating of the wheels or gears or chains.

Potential Impact:

The system will have a direct impact on any vehicle owners. It can be implemented on almost all kinds of automobiles such as cars, trucks, motorcycles, ATVs and military vehicles. Not only vehicle owners need not worry about running out of battery power for their vehicles, they will also have a limitless amount of electricity that will drive the vehicles electrical components such as audio player, lightings, and charging docks. The greatest impact when the system is commercialized is the reduced spending on servicing or replacing the battery for their vehicles. Installing the system and using it for a few years will be more cost-efficient rather than having to replace the battery a couple of times per year.

Product Sales:

The system can be manufactured and utilized for all vehicle owners thus it is available for usage by individuals. The system can be implemented by the manufacturers of automobiles as part of the production process of the automobiles thus the customers will be buying vehicles already implementing the system. Apart from that, vehicle owners can also buy the system themselves and get it installed at a professional auto-shop. The system can also be allowed to be customized in such a way that the owners can select the charging rate of the battery to make sure their vehicles can operate the amount of electricity the owners wish to use from the vehicles battery power.

Other Potential Project (Dumbest ideas):

We have seen how watches nowadays can be powered by kinetic energy alone without using any battery. The moving part in the wrist watch will ensure the watch will keep on operating. Since we human are always in motion it would be nice to have a system in a compact package that will harvest the kinetic energy produced by us through walking or running. This compact package charger will enable us to charge our mobile phones when we run out of battery power but cannot charge the phone at that instant. The kinetic energy harvester can also be installed in mobile phones so that when we move with the phones, the system will recharge the phone at the same time. The biggest problem with the idea is how much the system will generate and what is the efficiency. Mobile phones producers should reduce the dimension of their batteries so that the kinetic harvester package system can be installed in mobile phones. However, the system should be very efficient that the power harvested from motions will be enough to power up the phone throughout the day.