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SMART ELECTRIC MOTOR VEHICLE WITH LORA COMMUNICATION SYSTEM AND THE RECOVERY OF A PART OF ELECTRIC POWER CONSUMPTION IN ORDER TO INCREASE AUTONOMY

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ABSTRACT

NOVELTY - The vehicle has systems on the live axle or on dead axle, for transmitting the rotation movement to generators provided with permanent magnets. The electric energy produced by generators is transferred by a wireless system placed inside a closed metallic enclosure and consists of two coils as transmitter and receiver, to a system for charging the storage batteries which supply the electric motor of the motor vehicle.

KEYWORDS

Electric Vehicles,
Smart electric motor,
Electric power recovery

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INTRODUCTION

The invention aims to create a smart electric vehicle with a LoRa communication system that allows data to be retrieved from different sensors placed on the vehicle for the purpose of monitoring the quality of the environment in a city (air, noise, dust, humidity, temperature differences) and with the functionality to recover part of the electricity consumed during acceleration and travel in order to increase autonomy.

RESULTS

Figure 1 shows how to install momentless electricity generators with permanent magnets connected either on one of the two decks (front or rear) or on both, these generators being connected to the wheels by means of couplings. The two generators located on the front axle shall be fitted using two cardanic shafts to take over the rotational movement of the wheels. The transfer of energy from the generators to the battery charging system shall be carried out through a wireless system in a closed metal enclosure. In this enclosure there is a coil that is emitter and a glider coil as a receiver. The use of this method will not hinder the movement of the vehicle, the capture of energy on the secondary coil being limited only by its constructive elements. The BLDC electric motor with Hall sensors is powered by batteries. This electric motor is built using the innovative 3D printing method using metal powder filament. The batteries are also connected to a photovoltaic system that provides an alternative charging during the solar light period. LoRa communication protocol will transmit the data provided by the air quality sensors placed on the vehicle's functional platform.

Figure 2 shows the smart electric vehicle control unit as well as the LoRa communication system along with the ambient quality sensors.

The advantages of using such a smart electric vehicle are important because, in addition to the energy recovery part consumed, it can be used as an ambient quality monitoring platform in a closed or open location without the risk of altering the data collected by the fact that its propulsion system does not exhibit any direct emission.

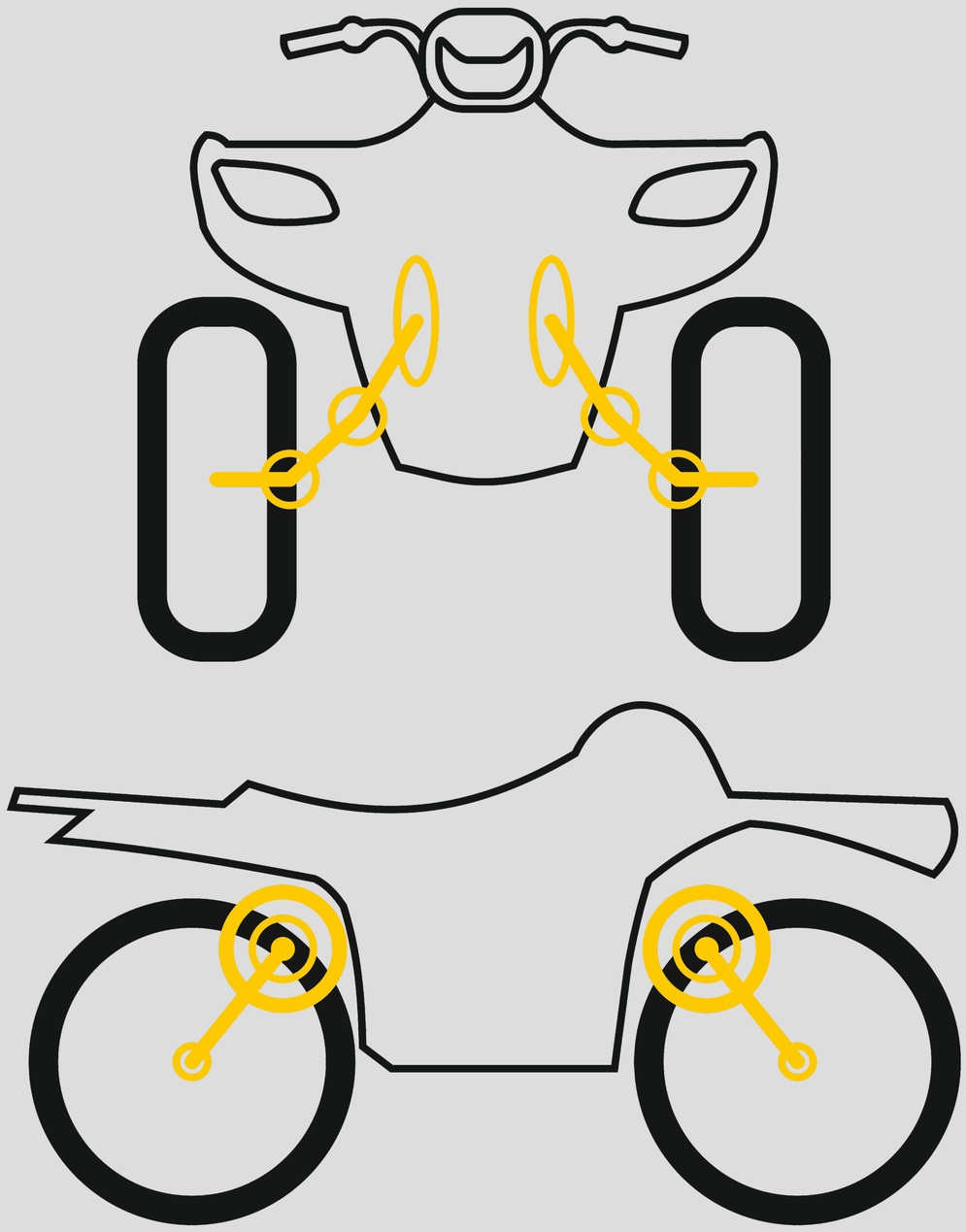

Figure 1. Arrangement of generators on the functional platform of the smart electric vehicle

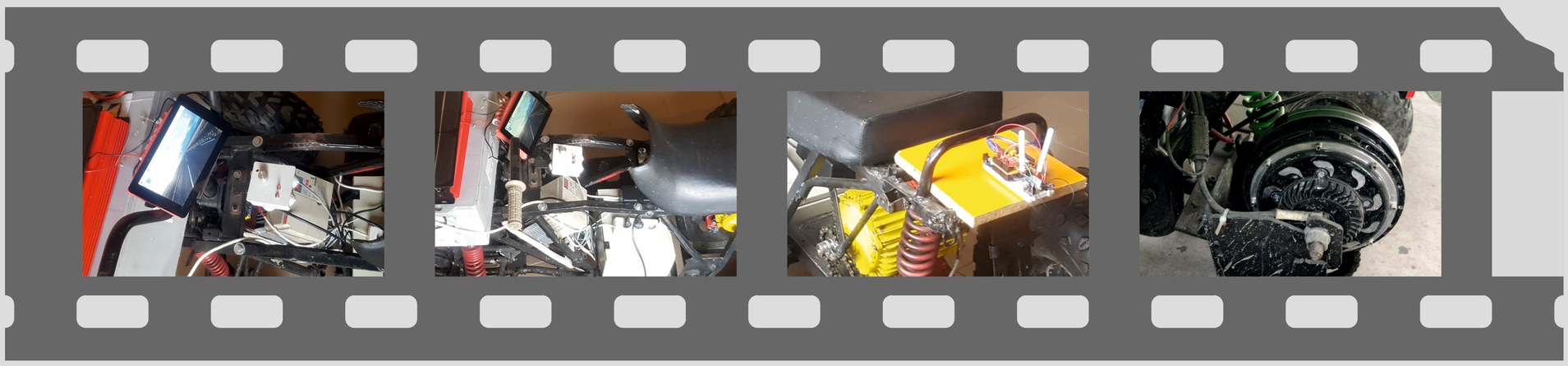

Figure 2. Command, control and monitoring elements implemented