

WATER OPERATED VEHICLE

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Abstract

The water operated vehicle, comprising a body including multiple wheels for moving the vehicle in certain direction, a reservoir attached with the body that reserves the water, a water pump connected to the reservoir that pumps out the water from the reservoir, a nozzle coupled with the pump that pressurizes the water and also maintains the direction of water flow, a turbine having multiple blades that operationally connected to the nozzle that changes high pressure water energy to rotational energy, a shaft attached with the turbine that transfers the rotational energy to the wheels via at least two axels, and a generator connected with the turbine that changes the rotational energy into electrical energy to provide electrical power to the pump.

Keywords: rotational energy, electrical power, water energy, vehicle, water.

1. Introduction

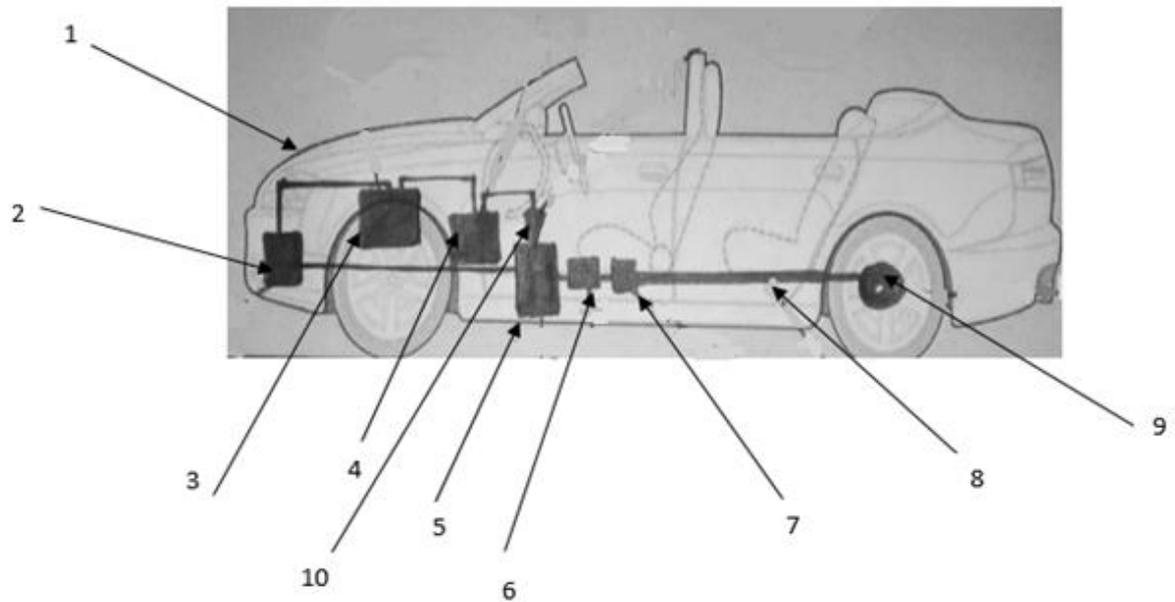
Energy is conserved quantity, which can neither be created nor be destroyed it can only transferred from one form to another form of energy, such as thermal to electrical energy, hydraulic energy to rotational mechanical energy. The energy can be classified into two types, such as renewable and non-renewable source of energy. The renewable source of energy is energy which can be renewed from renewable resources (i.e. solar energy, hydroelectric power, and geothermal energy etc). On other hand non-renewable source of energy is energy which cannot be renewed or replenished (i.e. fossil fuel; coal, petroleum and natural gas). It is essential that vehicles need source of energy to drive it from one place to another. The most common type of energy source is fuel. Conventionally, the vehicles are operated by combustion of fossil fuels, such as petroleum and diesel etc. When the combustion takes place, the hydrocarbon present in the fossil fuels creates energy. The heat which is used to burn fossil fuels cause molecules of carbon and hydrogen to react so as to produce large amount of energy. As the fossil fuels are non-renewable source of energy and produces large amount of pollution when they are burnt to extract large amount

of energy. In order to minimize the aforementioned limitations there is need to develop a vehicle that can move from one destination to another destination using renewable source of energy (i.e. hydraulic energy).

2. Experiment

The water operated vehicle for generating large amount of energy by striking high pressure water on the blades of a turbine so as to transform water energy to rotational energy [1]. The body of the vehicle is generally made up of steel [2]. It is having four wheels for the movement of the vehicle from initial point to final point. The reservoir having recirculating nature is installed in the body of the vehicle that stores the water. The water pump is connected to the reservoir that pumps the water from the reservoir and moves the water by mechanical action. [3] The pump can be classified into the three major groups according to the method they use to move the water, such as direct lift, displacement and gravity pump. The pumps are basically operated by some mechanism, such as reciprocating or rotary and consumes sufficient amount of energy to perform mechanical work, such as moving the water [4]. The pumps are operated via many energy sources, using manual operation, electricity, engines, or wind power from microscopic to large industrial pumps. The mechanical pumps are generally used in wide range of applications such as pumping water from the wells, aquarium filtering, pond filtering, and aeration, in the car industry for water cooling and fuel injection, in the energy industry for pumping oil and natural gas or for operating cooling towers. In medicinal industries the pumps are used for biochemical processes for preparing medicine, and as artificial replacements for artificial heart and penile prosthesis [5]. The nozzle is coupled with the pump that pressurizes water and controls the direction of water flow. It is basically a pipe that consists of dissimilar cross-sectional area and can be used to direct or modify the flow of the water. The nozzle is designed to control the rate of flow, speed, direction, mass, shape, and/or the pressure of the stream that emerges out from them. In the nozzle, the velocity of water increases at the expense of its pressure energy. The turbine is attached to the nozzle that rotates the blades of the turbine with the striking of high pressure liquid inside the body of the hydraulic turbine so as to convert water energy to rotational mechanical energy. According to newton's law, a force is directly proportional to the change in the momentum. If there is any change in momentum of the water a force is generated. In the hydraulic turbine blades

are provided against the flow of water which basically changes the momentum of the water. As if the momentum is changing the resultant force generated which is responsible for rotating the rotor or turbine. If the change in the momentum is high the force generated is also high which further enhances the energy conversion. The hydraulic turbine can be classified according to the energy available at inlet and direction of flow of water, specific speed, head available at inlet etc [6]. The impulsive turbine is those turbines that utilizes the impulse energy to rotate the blades of the turbine. Basically in this type of turbines all pressure head or pressure energy is transformed into velocity head or kinetic energy at the inlet of turbine by making use of the nozzle. This high speed water jet strikes at the blade of the turbine that develops a force which rotate it. Only the value of the kinetic energy is changed at the inlet and outlet of the turbine and the pressure of the water remains the constant [7]. The reaction turbine is generally used to rotate the blades of the turbine by utilizing pressure energy of the water. These turbines rotates partially due to impulse action and partially due to pressure change over the rotating blades. The water flow over the blades of the turbine transfers the kinetic energy as well as pressure energy into force and rotates the turbine. The change in pressure energy of the water is known as degree of the reaction of the turbine. They are basically low head and high discharge turbine [8]. The two axle are operationally attached to the nozzle that transfers the high pressure water energy to the rotational mechanical energy to the wheels to rotate the front and back wheels of the vehicles. The electrical generator is in connection with the turbine that converts the rotational energy to electrical energy to provide power for the operation of the pump. The generator includes a stationary magnetic field (stator) in which a rotating electromagnet spins to produce the electric current. The two axels are preferably rear and Trans axel.



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3. Result and Conclusion

4. The water operated vehicles are designed to run the vehicles from one location to another location using renewable source of energy, such as water. The vehicle includes a pump that sucks water, passes the water towards the nozzles and later the high pressure water is bombarded inside the turbine to convert water energy to rotational energy which is transferred to wheels of the vehicles to drive the same to specific location. The water operated vehicles are economical and environment friendly in nature.

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