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Electromagnetic Engine

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Abstract: *Today there is need of alternate fuel for day today life. Fuel prices are increasing rapidly and environment get polluted from the emission of hazardous gases from fuel sources. Shortage of the fuel is expected from consumption. Hence there is need of reduce the emission of gases like CO, SO_2, NOx, which are hazardous to nature. The main objective of this project is to develop pollution free engine which fulfill the fuel requirement. The working principle of electromagnetic engine is based on magnetic attraction and repulsion phenomenon i.e. Magnetic repulsion between same pole and attraction between different pole. This principle moves piston TDC to BDC and vice versa.*

Keywords*: CO-Carbon Monoxide, SO_2- Sulfur Dioxide, NOx-Nitrogen Oxide, TDC-To Dead center, BDC-Bottom Dead Center.*

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I. INTRODUCTION

In this technological world we are using many type of systems that work with less power and which has high engines for many purposes like transport, power speed that makes whole system compact, cost effective. generating, etc. but they are using fossil fuels. in this Therefore, by observing and considering problems of fuels are the one of the important pollutant of the shortage of electricity as well asfossil fuel and etc. We environment so they causes many problems like decide to make a mechanical system named greenhouse effect, decrease of ozone level so the harm "Electromagnetic Engine" for the operation of this piston full rays coming from the sun is directly affect the we are using readymade vehicle engine to which a human and other living organisms and it causes skin magnet (Power Permanent) connect and on the other cancer and other skin problems so we want to reduce hand opposite to permanent magnet a coil this problems also the fossil fuels are very lowest (electromagnetic) and magnetic switch fitted here for percentage in the world. operation of piston i.e. for movement of piston of inner After 50 years it will going to finished so we want to and other side of engine were using magnetic attraction wait another million years for getting this fossil fuel. So and repulsion Principle and by the use of we are ready for facing these problems. So we are going electromagnetic coil and magnet switch. This magnetic for one energy to face these problems. For solving field i.e. energy can be convert in the generation of those problems we are having an idea to run the engine. electrical energy by which system can operate.

It is electromagnetic engine in this we are using electrical energy as a fuel. This one is different from already existing one. In this we are using electromagnetic forces.
This project is about to design electricity operated engine construction. In this engine there is no use of fuels like diesel and petrol. So this engine is operating on pure electricity coming from a battery source. An electromagnet is positioned on the top of the cylinder, while construction of engine is traditional. And piston is just a permanent magnet (Neodymium magnet). There is no combustion within the cylinder so design of piston and cylinder arrangement is simpler as compared to IC Engine. So the accuracy of dimensions is not a serious matter here.
Today the demand of user friendly of interactive less power consumed products are increasing This is done because of shortage of electrical energy and today energy saving is the most important objective because of the limited resources of fossil fuel which is likely to be exhausted with few years.
Also, there is a rapid development in technology as well as in mechanical automobile and many other fields. due to this rapid change or development peoples prefer

2. LITERATURE SURVEY

In the late 1820s and early 1830s two of the world's leading scientists; Michael Faraday and Joseph Henry were conducting a series of experiments utilizing the newly discovered phenomenon of electromagnetism. This work led to a number of scientists endeavoring to develop practical electric motors. [8]
The early electromagnetic engines can be broadly divided into two groups.
The first to appear were the reciprocating engines. One problem that faced the experimenters was converting the linear motion of an electromagnet into a rotary motion. Contemporary steam engines solved this problem by the use of connecting rods and cranks and initially it seemed logical to follow suit. These reciprocating electromagnetic engines are a fascinating example of one of technologies dead ends.
The second group was the rotary engines pioneered by Paul-Gustav Foment. These did away with the connecting rods and linkages of the reciprocating engine and evolved into the modern electric motor. Although the electric motor was an important development as a

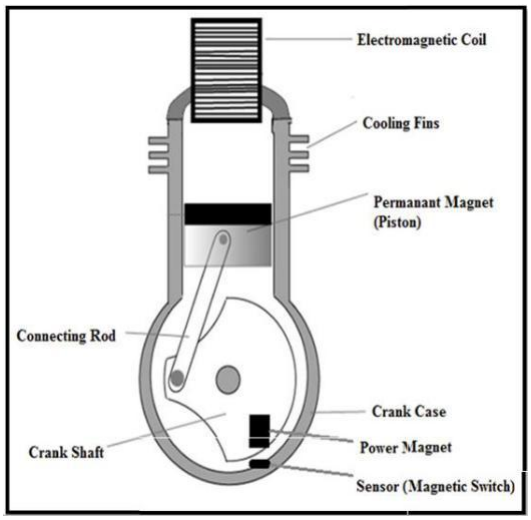
new power source, the alternatives at that time being water, wind, or steam, it would be many years before it became widely used. The problem was that the only practical source of electricity supply in the 1840s was batteries; reliable electrical power distribution did not become available until well into the second half of the nineteenth century. In the 1840s it was estimated that an electric motor powered by zinc/carbon batteries cost seventy times more to run than a coal fired steam engine of equivalent power.

This is the story of the rise and fall of the little known electro-magnetic engine. During the late 1700s and early 1800s, many interesting and little understood electrical experiments were conducted both here and abroad that eventually led to the discovery of the electric motor. In 1800, for instance, Volta invented an early form of a battery that greatly enhanced electrical experiments that previously relied on a form of capacitance (Leyden jars), for electrical energy. In 1820, Oersted discovered by accident that electricity through a wire would deflect the needle of a compass and concluded that some form of magnetism was present. In 1831, Faraday discovered the magnetic field and hence the effect of an electrified coil on steel and on a permanent magnet and vice versa. Faraday's experiments and discoveries led to many useful inventions, including the multipolar motor in 1838 by Jacobi, the telegraph in 1840 by Wheatstone and Morse, the dynamo in 1871 by Gramme, and the telephone in 1876 by Bell to mention a few. But, in 1845, one industrious entrepreneur by the name of Bourbouze, wanted to capitalize on the electric coil 'solenoid effect' in a grand manner. He envisioned solenoid driven crankshaft engines powered by rooms full of batteries, as an alternative to the then current steam power. So, in a fashion similar to the later 'half-breed,' Bourbouze removed the cylinder, piston and valve system from a steam engine and replaced them with a large electric coil, a plunger, a switch arrangement for timing. Well-yes, the engine worked, but there wasn't enough sulfuric acid and zinc available in quantity for the batteries to meet the need and to compete with the low cost, readily available coal for steam engines. So, like many other early ideas and inventions, the electro-magnetic engine was short lived. Later, the term electromagnetic engine was changed to electric motor. Coincidentally, the efficiency of the early steam engine and the electro-magnetic engine were about the same at 20-25%, as compared to the later well-developed D.C. motor at 95%, and the A.C. Motor at 89%.

III.WORKING PRINCIPLE OF ELECTROMAGNETIC ENGINE

This engine works on the principle of magnetic repulsion between same poles of the two different magnets. When similar poles of two magnets come in contact with each other they will repel each other with equal and opposite force. This phenomenon of repulsion is used in this engine to create motion. The Electromagnet which is placed at the top of the cylinder of the engine repels the permanent magnet placed at the place of piston in IC Engine such a way that the magnetic force produced by the electromagnet repels permanent magnet. Piston i.e. Permanent magnet is connected to the crank shaft through connecting rod.. This arrangement converts the reciprocating motion of piston into the rotary motion of the crank shaft. This is our useful work. The electromagnetic piston engine according to the present invention in one aspect comprises a cylinder and a piston, each made of a magnetic material, a cylinder electromagnet having an inner wall of the cylinder magnet sable to a one magnetic pole, and a piston magnetization unit for magnetizing a portion of the piston engage able with the cylinder to a single magnetic pole in a fixed manner, in which the piston is transferred in a one direction by creating a magnetic attraction force between the cylinder and the piston by exciting the cylinder electromagnet; and the piston is then transferred in the opposite direction by creating a magnetic repellent force there between, followed by repeating this series of the actions of alternately creating the magnetic attraction force and the magnetic repellent force to allow the piston to perform a reciprocal movement.

The electromagnetic piston engine according to the present invention in a still further aspect is constructed by arranging a combination of the cylinder with the piston in -the aspects described above as a one assembly, arranging the one assembly in plural numbers and operating the plural assemblies in a parallel way, and converting a reciprocal movement of the piston in each of the plural assemblies into a rotary movement of a single crank shaft by a crank mechanism so that more can be produce for propelling any heavy vehicle.



3.1 Concept diagram of single cylinder electromagnetic engine

IV. COMPONENTS OF SYSTEM

4.1 Engine:

When head of piston is came near the spark plug then by limit switch the supply produced to the primary coil of Height voltage coils which is generated by the engine with the help of magnet and coil. Due to this bombarding of fuel will do and therefore piston pull of back side. At that time supply break by limit switch which is internally fitted in the engine.

The piston came at outer side due to the weight of flywheel and air pressure. This process will carried out again and again.

4.2Battery:

It stored Electrical energy in the chemical form. It is used for the purpose of giving supply to the engine.

A battery is source of Electrical energy. These are the device which maintains current by transferring chemical energy into electrical energy. This electrical current is maintained by an electromotive force inside the battery. The emf in the battery equal to the potential difference between its terminals, where there is no current flow because there is no internal voltage drop. The essential difference between a cell and a battery is that the cell is single unit which convert chemical energy into electrical energy whereas battery is combination of this cell. Battery is used as an alternate source of power instead of the fossil fuels. Lithium batteries with higher power ratings are available at relatively cheaper cost and with high duty cycle, they serve perfectly for application in an electromagnetic engine. Lithium batteries are relatively lighter in weight and can be combined to give desired power rating

4.3Relay:

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used. Relays are used where it is necessary to control the current by a low power signal, or where several circuits must be controlled by one signal. A simple electromagnetic relay consists of

4.4 Power Magnet:

Any substance which has the property of attracting small piece of Iron or other magnetic substance and point towards north and south. When freely suspended is known as magnet.

In this project power magnets are use. One is attached on the head of piston and other is attached to flywheel. The magnetic energy stored in power magnet. It is use to push the piston in bottom dead center.

4.4.1 Types of Magnetic Material:

i] Ferromagnetic material
ii] Paramagnetic material
iii] Diamagnetic material

4.5 Transformer:

A transformer is a device that transfers electrical energy from one circuit another by electromagnetic induction (transformer action). The electrical energy is always transferred without a change in frequency, but may involve changes in magnitudes of voltage and current.

Because a transformer works on the principle of electromagnetic induction, it must be used with an input source voltage that varies in amplitude.

There are many types of power that fit this description; for ease of explanation and understanding, transformer action will be explained using an ac voltage as the input source.

It is used for the purpose of battery charging. It converts AC 230 volt into AC 12 Volt having current 1 Amp. The supply of obtain of transformer is AC by using rectifier circuit it covert into DC unregulated.

4.6 Switch:

A switch is an electrical component that can break an electrical circuit, interrupting the current or diverting it from one conductor to another. It is used to enable the

a coil of wire warped around a soft iron core. An iron yoke which provides a low reluctance path for magnetic flux, a movable iron armature, and one or more sets of contacts. The armature is hinged to the yoke and mechanically linked to one or more sets of moving contacts. It is held in place by a spring so that when the relay is de-energized there is an air gap in the magnetic circuit. In this condition, one of the two sets of contacts in the relay pictured is closed, and the other set is open.

When an electric current is passed through the coil it generates a magnetic field that activates the armature and the consequent movement of the movable contact either makes or breaks (depending upon construction) a connection with a fixed contact. If the set of contacts was closed when the relay was de-energized, then the movement opens the contacts and breaks the connection and vice versa if the contacts were open. When the current to the coil is switched off, the armature is returned by a force, approximately half as strong as the magnetic force, to its relaxed position.

supply of current from the battery to the coil, relay and magnetic switch i.e. to ON and OFF current supply. The most familiar form of switch is a manually operated electromechanical device with one or more sets of electrical contacts, which are connected to external circuits.

Each set of contacts can be in one of two states: either "closed" meaning the contacts are touching and electricity can flow between them, or "open", meaning the contacts are separated and the switch is non-conducting.

The mechanism actuating the transition between these two states (open or closed) can be either a "toggle" (flip switch for continuous "on" or "off") or "momentary" (push-for "on" or push-for "off") type.

5. BLOCK DIAGRAM

The working of the proposed engine can be well studied by going through the following block diagram

5.1 Block Diagram of proposed engine

As shown in the block diagram the main components required are battery (power source), high rating current controller i.e. relay, transformer, coil and the electromagnetic engine with power magnet

VI. ECONCLUSION

The electromagnetic repulsive engine has various advantages. The main advantage is, no fuel is being used in the engine. This results into no pollution which is very need in the present day situation. As there is no any type of combustion taking place inside the cylinder there is only very little heat generation by the coils.

This eliminates the need for a cooling system and desirable for any automobile. As magnetic energy is being used the need for air filter, fuel tank, supply system, fuel filter, fuel injector, fuel pump, valves etc. are neglected and the design of the engine is made simple. Also by the use of materials like Aluminum, titanium etc. we can reduce the weight of the electromagnetic engine. Also existing transmission systems can be used in the electromagnetic engine. Less noise is produce during working.The disadvantage of this engine is its high initial cost. The electromagnet and permanent magnet can be costly. Also the power of the permanent magnet will decrease during time and the permanent magnet has to be replaced during limited periods. The engine is not as flexible as the internal combustion engine. The engine power source is battery. The number of batteries will vary according to the requirement. In high power engines, the number of batteries will increase which maybe increase the total weight of vehicle and consume a lot of space. Also the batteries needs to be charged regularly which is difficult and time consuming. So the engine is not dependable the prototype is an idea which uses the property of an electromagnet by property of which it changes the polarity of its poles whenever the direction of current is changed.

This variation in polarity is utilized to attraction or repulsion the permanent magnet attached to the piston. Also, by inserting more permanent magnets in series on the piston will enhance the output of the engine. By slight modification in design and by the use of better hands the engine can be modified to generate more power, thereby increasing its efficiency, so it can be used in commercial vehicles and other applications.

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