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Research Paper

MAGNETIC PISTON ENGINE

Menta Sudheer[1]*, Konduru Vasu[1] and Kalahsti Sirisha Vamsi[1]

*Corresponding Author: Menta Sudheer, ✉ menta.sudheer@gmail.com

In the absence of viable alternative, until now, switching to new technology by changing from traditional Internal Combustion engines has been a challenge. So, "Magnetic piston engine" will fulfill the problem. It can be used to perform various tasks and functions that involve application of force or displacement of objects. This method provides an environmental friendly, very high efficiency engine that can complement or replace any engines that use fossil fuel, bio-fuel, solar power, wind power, hydro power, electricity, storage energy, or other energy sources.

Keywords: Magnetic piston, Multi cylinder

INTRODUCTION

Coal, petroleum, natural gas, water and nuclear energy are the five main energy sources that have played important roles and have been widely used by human beings. Magnetic engines are defined as 2-phases engine which has no exhaust emission, higher efficiency such characters are seen in these kinds of engines.

Global Issues

Everyday radios, newspapers, televisions and the internet warn us of energy exhaustion, atmospheric pollution and hostile climatic conditions. After few hundred years of industrial development, we are facing these global problems while at the same time we maintain a high standard of living. The most important problem we are faced with is whether we should continue developing or die. The United Nations Energy Organization names all of them elementary energies, as well as conventional energies. Electricity is merely a second energy derived from these sources. At present, the energy consumed all over the world almost completely relies on the supply of the five main energy sources. The consumption of petroleum constitutes approximately 20% of energy used from all sources, so it is the major consumer of energy. Statistics show that, the daily consumption of petroleum all over the world today is 40 million barrels, of which about 50% is for automobile use. That is to say, auto petroleum constitutes

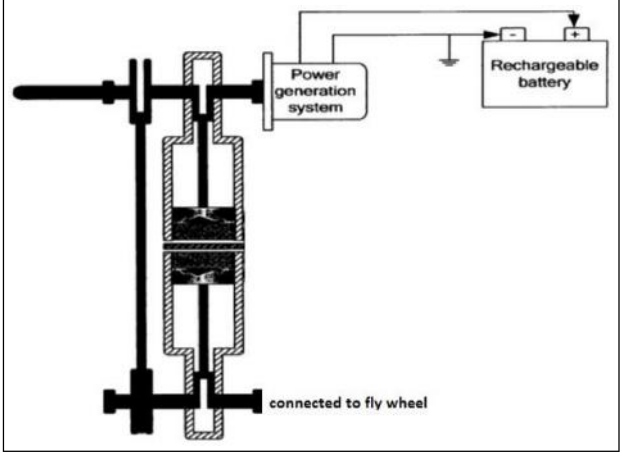
[1] Geethanjali Institute of Science and Technology, Nellore, Andhra Pradesh, India 524004.

about 35% of the whole petroleum consumption.

In accordance with this calculation, daily consumption of petroleum by automobiles all over the world is over two million tones. At the same time as these fuels are burnt, poisonous materials such as 500 million tons of carbon monoxides (CO), 100 million tones of hydrocarbons (HC), 550 million tons of carbon, 50 million tones of nitrogen oxides (NOx) are emitted into the atmosphere every year, severely polluting the atmosphere. At the same time large quantities of carbon dioxide (CO_2) gases, resulting from burning, have also taken the major responsibility for the green house effect. Atmospheric scientists now believe that carbon dioxide is responsible for about half the total green house effect. Therefore, automobiles have to be deemed as the major energy consumer and atmosphere contaminator. Also, this situation is fast growing with more than 50 million vehicles to be produced annually all over the world and place into the market. However, at is estimate that petroleum reserve in the globe will last for only 38 years. The situation is really very grim. Hence, in the absence of a variable alternative, until now, switching to new technology by changing from traditional Internal Combustion engines has been a challenge.

The invention of Magnetic piston engine Figure 1, generally relates to the reciprocating engine based on linear, back-and-forth movement of the pistons and the improvements thereto. The uniqueness of this invention comes from the fact that Magnetic piston engine can be effectively can be effectively integrated with equipments and

Figure 1: The Cross Sectional View of the Basic Block Diagram of MAPS Engine



machines that need engine to perform various tasks functions. It can work as an automobile engine, aircraft engine, locomotive engine, ship engine, lawn mover engine, etc., depending on the requirement. In general, it can complement or replace existing engines that use fossil fuel, bio-fuel, electric power, solar power, wind power or stored power, etc. Further, it can also be used to drive the power generators to produce the electricity. The use of Magnetic piston engine is limitless when the application area is considered.

Unlike Steam engines and Internal Combustion engines, Magnetic piston engine is environmentally very safe since it does not burn any fuel. Due to the rising fuel costs, environmental issues and diminishing natural fuel reserves, Magnetic piston engine became a variable alternative to many existing engines.

TECHNICAL FEATURES

Principle

The Magnetic piston engine works in the principle of “like poles repel and unlike poles attract” of magnetism. “Magnetic piston engine” is also named as Maps engine. Due

to the principle of its operation, Maps engine uses very low power (small force) to generate very high power (large force). Hence, Maps engine works at very high efficiency with the possibility of reaching unity-over operation mode. Some of the important parts used in Magnetic piston engine are as follows:

Magnetic Piston

Magnetic Piston uses free energy derived from the renewable resource of magnetism and the Earth's energy field. It does not generate any pollution, so it will help the environment. No exotic materials or alloys are required for piston. Piston requires neodymium magnets.

Ferromagnetic Material

Ferromagnetic materials have a large, positive susceptibility to an external magnetic field. They are highly attracted to magnets and can become permanently magnetized. They get their strong magnetic properties due to presence of magnetic domains. When ferromagnetic material is in the unmagnitized state, domains are randomly organized and the magnetic material field for the part as a whole is zero. Iron and nickel are good examples.

Multi-Cylinder

A typical kind of cylinder construction that is needed in Magnetic piston engine. This is in contrast to the cylinders normally used in other reciprocating engines. Since Maps engine uses only magnets for its operation, the cylinder must take care of unwanted magnetic fields and other losses. Further, the cylinder material itself should not get attracted to the magnets and resist the movement of the pistons. The cylinder must be only made up of non-magnetic materials such as stainless steel, titanium or similar materials of high resistivity and low electrical conductivity. Alternatively, cylinder can also be made up of non-metallic, thermal resistant materials as well or can be made by integrating both non-magnetic and non-metallic materials. In case of non-magnetic metallic material and when ever needed, the cylinder will have inner tube, outer tube and intermediate semi-cylindrical shaped concentric laminations. Also, the inner tube of the cylinder will have small, linear slots around it.

Power Generation System

It is used to charge the battery by generating the power from the engine. PGS contains a generator to covert mechanical energy in to electrical energy. A dynamo is an electrical generator that produces direct current with the use of a commutator. A commutator is the moving part of a rotary electrical switch in certain types of electrical generators. With a commutator, a dynamo becomes an alternator, which is a synchronous singly fed generator. Alternators produce alternating current with a frequency that is based on the rotational speed of the rotor and the number of magnetic poles.

Rechargeable Battery

Rechargeable battery is perhaps the most important component of the entire electrical system of a vehicle. It supplies the current for the lighting system and to various electrical/ electronic components and accessories. Battery containers are of single-piece construction and were at one time made of either hard rubber or of a bituminous material. There are two types of battery plates, positive and negative. For each plate there is a supporting frame work or grid made of an alloy

of lead and antimony. One positive and one negative group of plates are slid over each other, with separators in between, to form a cell.

MAPS OPERATION CYCLE

Maps engine with the magnetic heads at different positions during the operation cycle are shown in Figures 2-3. Both the pistons are always at equidistant from the ferromagnetic material within their non-magnetic cylinder during the pistons operation. The piston can be in any position within the cylinder during the initial turn-ON of the engine. The position of the piston in which it is farthest from the crankshaft is called the Top Dead Centre (TDC). Similarly, the position of the piston in which it is closest to the crankshaft is called the Bottom Dead Centre (BDC).

The engine with both the pistons at TDC due to the attraction by the ferromagnetic plate present in between the like poles heads as shown in Figure 2. When the ferromagnetic plate is pulled out from in between the pistons as shown in Figure 3, it quickly sets up a strong repulsion fore between the piston heads whose like poles always opposes each other.

Figure 2: The Cross Sectional View of the Basic MAPs Engine, with Both the Opposing Pistons at TDCs, Ready for Repulsion Stroke When the Ferromagnetic Plate Placed in Between them is Pulled Out

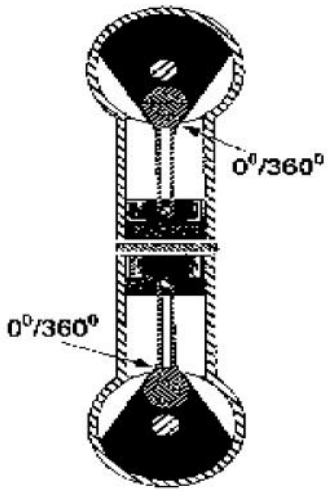


Figure 3: The Cross Sectional View of the Basic MAPs Engine, with Both the Opposing Pistons Being Repelled During the Repulsion Stroke While the Ferromagnetic Plate Placed in Between them is Being Removed

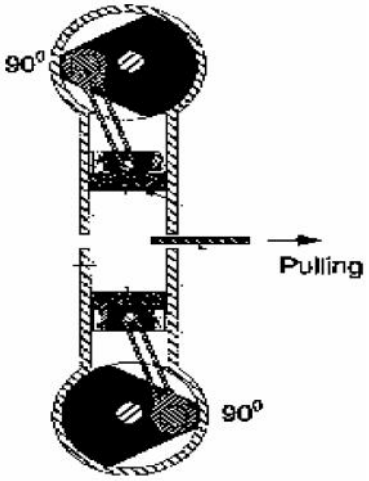
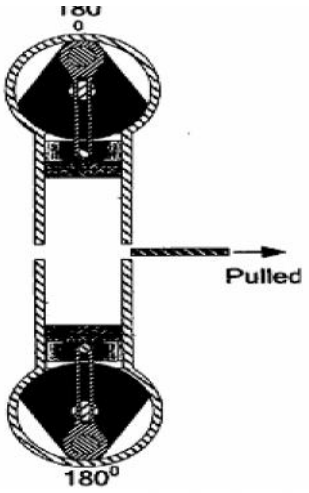


Figure 4: The Cross Sectional View of the Basic MAPs Engine, with Both the Opposing Pistons at Their BDC When they are Fully Repelled Due to the Removal of Ferromagnetic Plate Placed in Between Them



This sets up the repulsion stroke that causes the pistons to quickly move away from each other within their respective cylinders. The linear backward movement of pistons from the ferromagnetic creates an angular movement of the crankshaft, in Figures 2-4, at every 90° interval during the repulsion stroke. When both the opposing pistons move 180° (BDC) point as in Figure 4, the ferromagnetic plate is inserted in between the like pole heads as shown in Figure 5. The excess energy stored in the flywheel from the previous repulsion stroke aided by the attraction of the magnetic heads by the ferromagnetic plate causes both the pistons to move towards the ferromagnetic plate. This forms the attraction stroke during the second half of the angular movement of the crankshaft completing the remaining 180°, thereby bringing the pistons to TDC (360°) point as in Figure 7. Figures 5-7 shows the angular movement of the crankshaft at every 90° interval during the attraction stroke.

Figure 5: The Cross Sectional View of the Basic MAPs Engine, with Both the Opposing Pistons at BDC at the Beginning of the Attraction Stroke After the Iron Plate is Pushed in Between Them

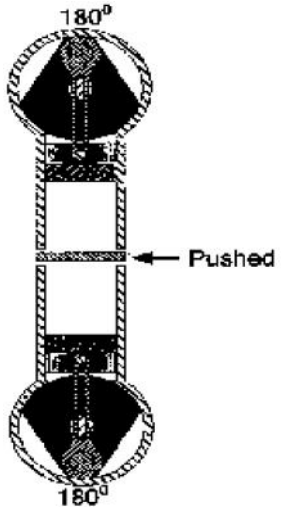


Figure 6: The Cross Sectional View of the Basic MAPs Engine, with Both the Opposing Pistons Moving Towards Their TDC When the Iron Plate is Pushed in-Between them During the Attraction Stroke

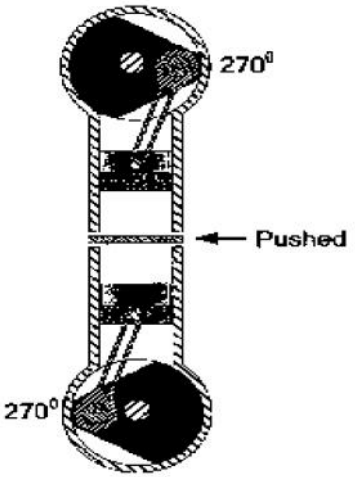
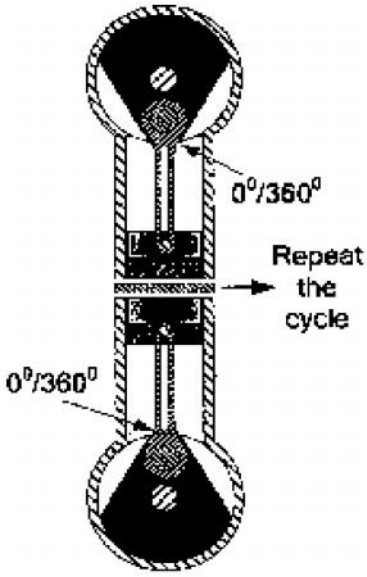


Figure 7: The Cross Sectional View of the Basic MAPs with Both the Pistons Ready for the Next Cycle



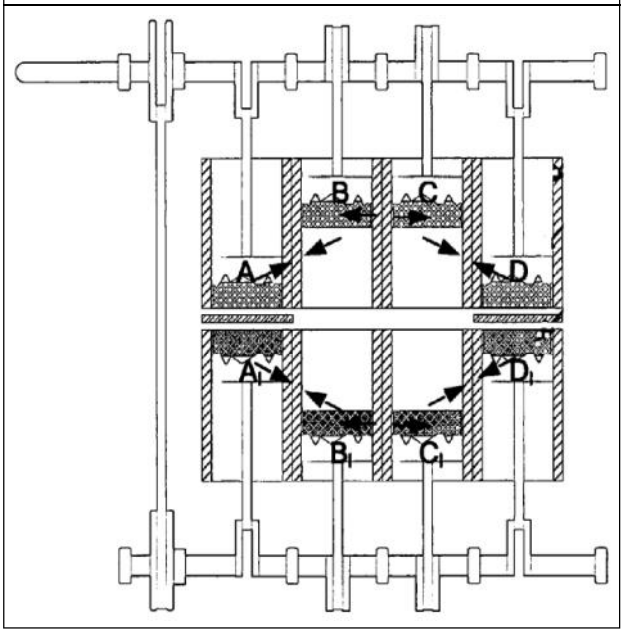
MULTI-CYLINDER CONFIGURATION

Maps engine works purely on the principle of magnetism. The piston magnets always try to attract or repel one another when they come

near each other's field. Hence, it must be ensured that no two adjacent pistons of a particular row come in the vicinity of each other's magnetic field. In the absence of proper magnetic shielding between the individual cylinders and pistons of a particular row, the multi-cylinder concept that is normally used in traditional, Internal Combustion engines cannot be applied to Maps engine.

Multi-cylinder engine with the pistons ABCD (and $A_1B_1C_1D_1$) configured in staggered manner. When the pistons A, D are near TDC, the pistons B, C will be near BDC and vice-versa. Hence the unlike poles of magnets of pistons A, will attract the unlike poles of magnets of pistons B, C forming a strong bond between pistons AB and CD as shown by arrows in Figure 8. Similarly, A_1B_1 will bond with C_1D_1. This creates latching of adjacent pistons of a particular row and loss of energy thereby failing the engine to operate properly. In addition, there exists a sidewise force of repulsion between the cylindrical surfaces of adjacent pistons of a particular row when they cross each other resulting in the loss of energy.

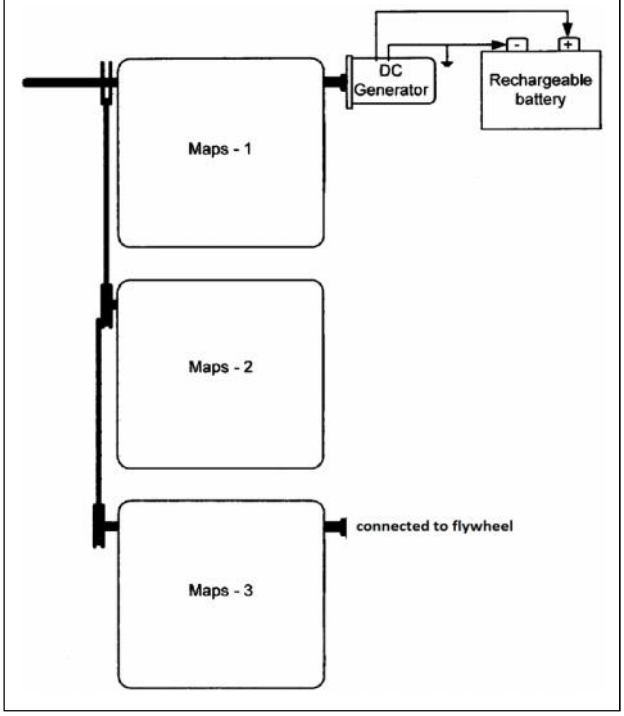
Figure 8: The Cross Sectional View of the Staggered Multi-Cylinder MAPs Engine



PARALLELING OF MAP ENGINE

The configuration involves large number of cylinders; individual engine blocks can be paralleled by coupling their flywheels by flywheel rods as shown in Figure 9. Note that all flywheels operate synchronously. This helps in combining and regulating the total energy generated by all reciprocating magnetic pistons.

Figure 9: The Paralleling of Several MAPs Engine Blocks to Build Large Engines



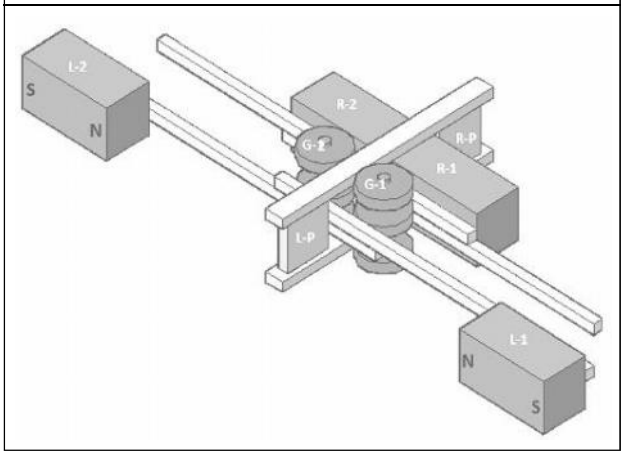
MECHANISM OF MAPS ENGINE

Maps engine works in movement of ferromagnetic plate in between any two opposite cylinders. The movement of plate is

in the form of 'to and fro' motion by using linked mechanism with combining four cylinders. In that we consider four pistons, two ferromagnetic plates and two gear drives. The four pistons are L-1, L-2, R-1 and R-2.

The two plates are L-P and R-P. The plates are between the two frames. The gear drives are G-1, G-2 as shown in Figure 10. In each gear drive has three gears (a, b, c). Where 'a' and 'c' gears in both gear drives are meshed with above and below frame of the plates respectively and 'b' gear is meshed with the piston rods.

Figure 10: The Isometric View of the MAPs Engine Mechanism, When the Left Side Pistons are at BDC as Well as the Right Side Pistons are at TDC



Working Principle

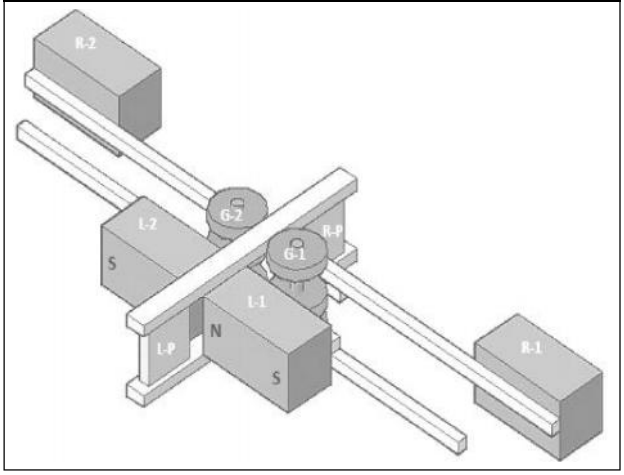
The magnetic pistons L-1 and L-2 are at BDC, R-1 and R-2 are at TDC. We consider it is an initial position of the MAPs engine.

The ferromagnetic plate (L-P) attracts the both pistons (L-1 and L-2) at the same time the pistons (R-1 and R-2) repels each other. The rods which are attached to the pistons will move along with the piston movement. The rods are meshed with gear 'b' in both gear drives (G-1 and G-2). When the gear 'b' rotates accordingly the gears (a and c) rotates. The gears (a and b) are meshed with the frames so the frames move is linear direction. When the frame moves, then plates also moved with the frames. When the pistons (L-1 and L-2) come to TDC and the pistons (R-1 and R-2) come to BDC. We see the pistons (L-1 and L-2) first, when they move towards the TDC the ferromagnetic plate moves left side with help of gear drives (G-1 and G-2). When the pistons reach the TDC at the same time the plate completely moved to the left.

The two opp. magnetic pistons come near to each other, then both 'N-Poles' repels and the pistons will repel back to the BDC. Now the pistons (R-1 and R-2), the two pistons are near and opposite to each other. As we discussed above the N-Poles repels each other and moves towards the BDC.

When the pistons moves the gear drives, then will rotate (i.e., G-1 rotates in anti-clock wise direction and G-2 rotates in clock wise direction). The drives rotate and then the frame moves to left side. The Figure 11 shows the

Figure 11: The Isometric View of the MAPs Engine Mechanism, When the Left Side Pistons are at TDC as Well as the Right Side Pistons are at BDC



pistons (L-1 and L-2) at TDC and the pistons (R-1 and R-2) at BDC. The plate goes in between two pistons (R-1 and R-2) and then plate attracts the pistons, as we seen in the pistons (L-1 and L-2). These two processes will continue throughout the working.

CONCLUSION

There is, at this day, wonder solution for the replacement of the internal combustion engine. Only improvements of the current technology can help it progress within reasonable time and financial limits. The Magnetic Piston Engine fits perfectly into this view. Its adoption by the automobile industry would have a tremendous impact on the environment and world economy. By further research and development it can prove to be a boon to the middle class Indian citizen.

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