

Study of Working and Construction of Quasi Turbine Engines in Vehicles

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ABSTRACT

The Quasi turbine motor is a multi-fuel, ceaseless torque rotating motor. It a subsequent stage in the realm of Engine look into is to run motor on air or some other fuel. Turbine attributes help accomplishing this objective. The semi turbine turbo-machine is a weight driven, constant torque and symmetrically deformable turning wheel. The Quasi turbine is a smaller, low weight and high torque machine with top effectiveness, particularly in control adjustment applications. A standout amongst the most imperative things is squander vitality recuperation in mechanical field. As the regular assets will debilitate, vitality recuperation has extraordinary significance. A semi turbine turning air motor having low rpm and takes a shot at low weight recoups squander vitality might be as any gas or steam. This paper talks about idea of semi turbine air and ignition motors likewise the examination between the semi turbine motor and alternate motors.

Keywords: Quasi turbine (QT), Positive displacement rotor, piston less Rotary Machine.

I.INTRODUCTION

The Quasi-turbine is another motor innovation that was designed in 1990 and protected in 1996. The idea of semi turbine rotating air motor was first presented by Gilles Saint-Hilaire and etal. The primary inquiry can come in any every once mind is that, why the name Quasi-turbine? Since simply like the regular turbine, Quasi-turbine has a (semi) persistent stream at admission and fumes, propulsive dead time is zero. The Quasi-turbine is a weight driven, constant torque and symmetrically deformable turning wheel. The Quasi-turbine is enlivened by the turbine, idealizes the cylinder and enhances the Wankel. The Quasi turbine is a cylinder less Rotary Machine utilizing a deformable rotor whose vanes are pivoted at the vertices. The volume encased between the vanes of the rotor and the stator packaging gives pressure and extension in a manner like the natural Wankel motor, yet the pivoting at the edges permits higher pressure proportion. The Quasi turbine is a minimal, low weight and high torque machine with top effectiveness. Semi turbine motor disposes of all vitality squanders happening in cylinder and Wankel motor. It requires less time to pressure and development stroke. Semi turbine motor is a multi-fuel motor that implies we can utilize air or some other fuel like oil or diesel. Semi turbine air motor is a natural free motor since we are utilizing packed as a fuel. Additionally we realize that the world condition is more contaminated in view of gases that are transmitted from the car fumes and non-inexhaustible assets, for example, petroleum or diesel will go to vanish inside couple of years. So in such case semi turbine air motor is the best other option to introduce motor to spare condition and the non-inexhaustible assets.



Fig. 1: Quasi turbine Engine

The Quasi turbine idea came about because of research that started with an assessment of all motor ideas, taking a gander at the different points of interest, impediments and open doors for development of each. The Quasiturbine Engine was imagined by the Saint-Hilaire group headed by Dr. Gilles Saint-Hilaire and was first protected in 1996. During this exploratory procedure, the Saint-Hilaire group came to understand that a novel motor arrangement would be one that made enhancements to the standard Wankel, or rotating motor. The Quasi turbine is at the junction of the 3 present day motors: Inspired by the turbine, it consummates the cylinder, and enhances the Wankel. The Quasi turbine is all inclusive in connection to vitality sources: Pneumatic, Steam, Hydraulic, Combustion, Hydrogen, Detonation, Stirling and Rotary Expander (compressor/pump). The Quasiturbine does not have crankshaft, and is a revolving motor having 4 faces verbalized rotor with a free and available focus, pivoting without vibration nor dead time, and creating a solid torque at low RPM under an assortment of modes and fills. The Quasiturbine can likewise be utilized as air engine, steam motor, Stirling motor, compressor and pump. The Quasiturbine is additionally an enhancement hypothesis for a reduced and effective motor idea.

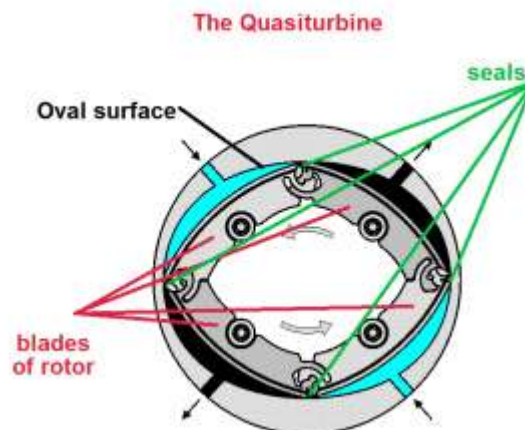


Figure 2: Quasi turbine pump/compressor (Hilaire,G.S.,2004)

II.LITERATURE REVIEW

The Quasiturbine is a proposed pistonless turning motor utilizing a rhomboidal rotor whose sides are pivoted at the vertices. The volume encased between the sides of the rotor and the rotor packaging give pressure and development in a manner like the more natural Wankel motor, yet the pivoting at the edges enables the volume proportion to increment. Licenses for the Quasiturbine are held by Saint-Hilaire. The Quasiturbine has been proposed as a conceivable pump plan, and a conceivable stirling motor. It has been exhibited as a pneumatic motor utilizing put away packed air, and as a steam motor. What is stressed in this task is the outline a pump (Curodeau,2012) The Quasiturbine crankshaft turning motor having a 4 faces explained rotor with a free and open focus, pivoting without vibration or dead time, and creating a solid torque at low RPM under an assortment of modes and powers. The Quasiturbine configuration can likewise be utilized as an air engine, steam motor, gas compressor or pump .In the pump mode, a Quasiturbine driven by an outside engine has 2 admissions and 2 exits identified with 2 semi particular circuits. Conceivable nonappearance of check valve is of impressive enthusiasm for some applications on the grounds that each Quasiturbine has 2 semi autonomous circuits, one can be utilized as a part of pneumatic, steam or water driven engine mode, while the other is utilized as vacuum or weight pump.(Saint-Hilaire , 2004)

Principle of Quasiturbine

Like Wankel motors, the Quasiturbine motor depends on a rotor and lodging plan. Yet, rather than three cutting edges of rotor, the Quasiturbine rotor has four components tied together, with burning chambers situated between every component and the dividers of the lodging. The four-sided rotor is the thing that sets the Quasiturbine separated from the Wankel. There are really two diverse approaches to arrange this outline — one with carriages and one without carriages. As we'll see a carriage, for this situation, is only a basic machine piece. To start with, how about we take a gander at the parts of less complex Quasiturbine show — the form without carriages. The easier Quasiturbine demonstrate looks particularly like a customary revolving motor: A rotor turns inside an almost oval-formed lodging. Notice, in any case, that the Quasiturbine rotor has four components rather than three. The sides of the rotor seal against the sides of the lodging, and the edges of the rotor seal against the internal fringe, isolating it into four chambers.

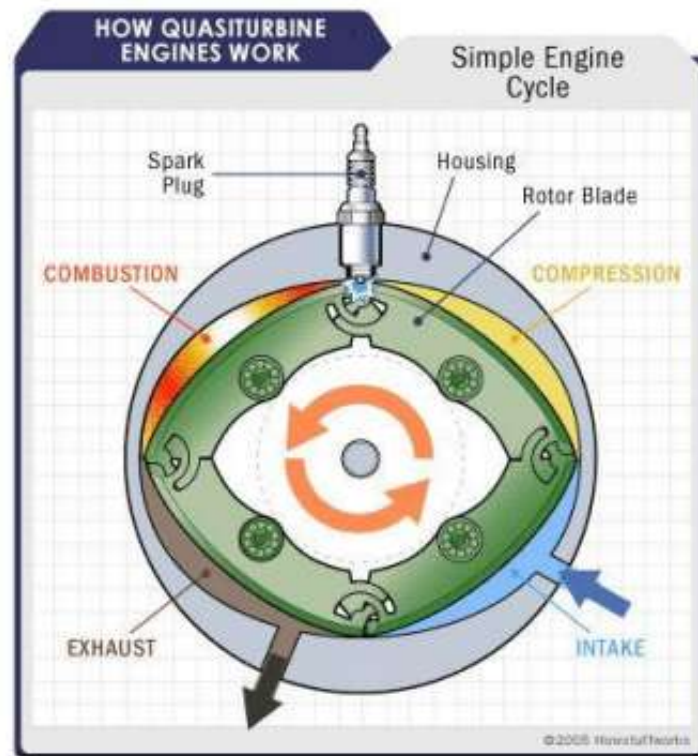


Figure 3a: Quasiturbine without carriage

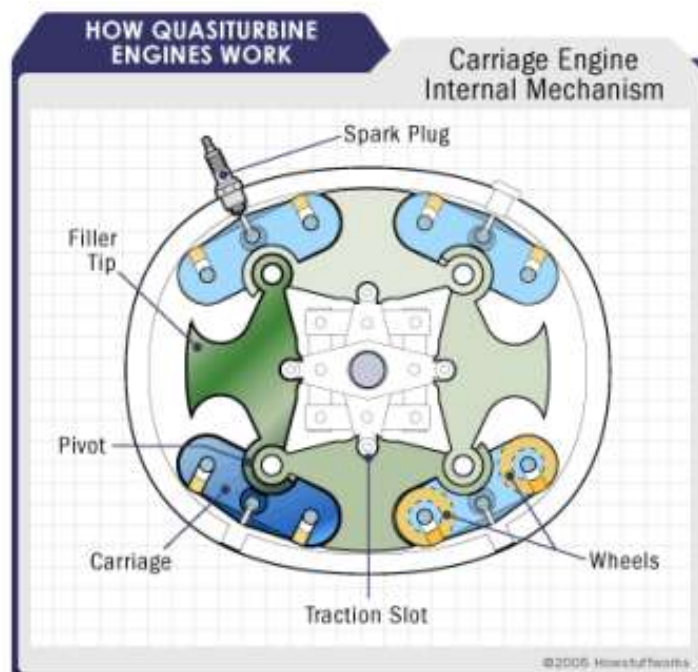


Figure 3b: Quasiturbine with carriage

In a cylinder motor, one finish four-stroke cycle produces two finish unrests of the crankshaft. That implies the power yield of a cylinder motor is a large portion of a power stroke for every one cylinder upset. A Quasiturbine motor, then again, needn't bother with cylinders. Rather, the four strokes of a run of the mill cylinder motor are masterminded successively around the oval lodging. There's no requirement for the crankshaft to play out the turning transformation.

III.CONSTRUCTION OF QUASI TURBINE AIR ENGINE

A Quasi turbine is along these lines a non-crankshaft turning motor having a four confronted enunciated rotor with free and available focus, pivoting without vibration and creating high torque at low RPM. The rotor as a gathering is deformable and the four countenances are combined by pivots at the vertices. The rotor comprises of four cutting edges which are indistinguishable. Every one of the four edges produces two pressure strokes for each insurgency which gives a sum of eight pressure strokes for every unrest when utilized as a compressor. At the point when utilized as an air or steam, eight power strokes for every upset are given. The model has four ports; beginning with the upper right port we will number the ports. Clockwise 1234. Ports 1 and 3 are admission ports and ports 2 and 4 are debilitate ports. For one total revolution of the rotor, the aggregate relocation is eight times the removal of a one of the chambers.

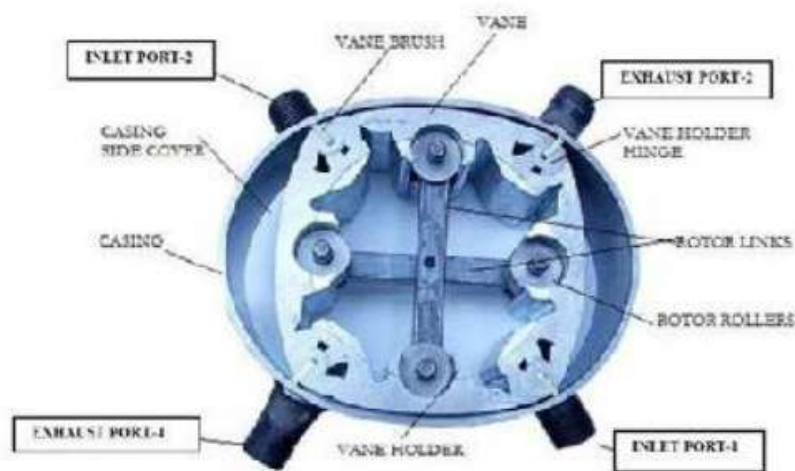


Fig. 4: Construction of Quasi turbine Air Engine

The main parts of the Quasi-turbine air engine are as follows:

- Casing
- Casing side plates
- Vanes
- Vane holders
- The inlet and exhaust ports

- Rotor links and Rotor roller
- The power train

V.WORKING OF QUASI TURBINE AIR ENGINE

The more straightforward semi turbine demonstrates looks especially like a conventional revolving motor. A rotor turns inside an about oval molded lodging. Notice, notwithstanding, that the quasiturbine rotor has four components rather than three. The side of the rotor seals against the sides of the lodging and the edges of the rotor seals against the inward outskirts isolating it into four chambers. In Quasi turbine air motor, an oval lodging encompasses a four-sided explained rotor which turns and moves inside the lodging, catching the working liquid (air) into four chambers. The two bay weight of packed air turns vanes inverse way this equivalent and inverse powers shapes a couple and rotor pivots. As the rotor turns, its movement and the state of the lodging cause each side of the lodging to draw nearer and more remote from the rotor, compacting and extending the chambers comparatively to the strokes in a responding motor. By specifically conceding and releasing air, the four assemblies of the rotor create eight power strokes for every rotor upheaval which brings about smooth task at a vast scope of revolution. The Quasi turbine pivots from weight as low as 1 bar. It has higher energy to weight proportions and mechanical straightforwardness.

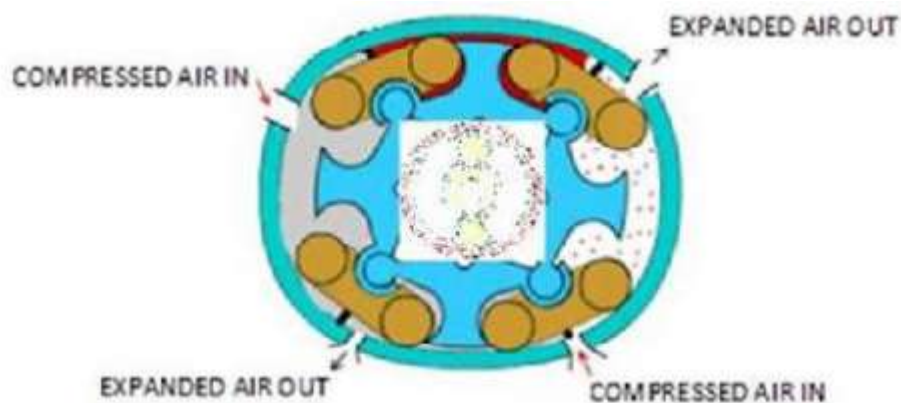


Fig. 5: Working of Quasi turbine Air Engine

VI.CONCLUSION

The Quasiturbine is in this manner a weight driven motor creating nonstop torque with unevenly deformable turning wheel. It is another motor option with a few qualities at the same time normal to the turbine, Wankel and cylinder. An audit of the innovation and conceivable uses of steam motors to mechanical power and waste warmth openings demonstrates that air motors are probably going to be a piece of the vitality architect's portfolio as we advance .The essential confinement of the semi turbine motor at a present stage is that it is in its outset organize. In spite of the fact that a ton of progression has been made since its innovation has been stamped semi turbine is another innovation likely unwelcome in the realm of motor foundation. Later on, be that as it may, you will probably observe the Quasi-turbine use in something other than your auto.

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