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Evaluation of the RKM Technology.

I have reviewed all available information on the new RKM (Rotation Piston Machine) technology in order to evaluate its scientific and technological soundness, novelty, advantages, and promise for the future in comparison with other existing and proposed technologies for internal combustion engine. Below is the summary of my review.

1. The RKM technology employs a novel geometry of the engine chamber and the piston. In particular, the cross-section of the chamber is a curvilinear polygon, which is a figure of a constant width, and the piston has a multi-oval shape. The piston rotates always in the same direction around alternating centers of rotation, instead of the rectilinear reciprocal motion in a conventional crank engine.
2. Another important feature of the RKM technology is a new kinematic principle of the power transfer from the piston to the main drive shaft. The authors have solved a difficult engineering problem and developed a new type of gearing mechanism where the trajectory of the center of the gear-wheel is a curve with singularities (angles). This new discovery is crucial for practical implementation. Some previous attempts to construct a rotary piston machine could not be implemented because of the absence of a feasible power transfer mechanism.
3. The fundamental advantage of the RKM engine over conventional reciprocal motion engines is that it gets rid of the bulky and inefficient crankshaft mechanism, thereby fulfilling the century-long dream of mechanical engineers. The major result is that RKM engine has a 4-5 times greater power density. Other advantages include, in particular:
 - i) higher efficiency, as a result of smaller losses in the mechanical power transfer chain;
 - ii) smaller wear and tear, as a result of smaller impact load;
 - iii) even distribution of the torque;
 - iv) compactness and scalability

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4. The crucial advantage of the RKM machine over the Wankel engine (the only implemented type of rotary piston internal combustion engine) is that the efficiency of the RKM engine is several times higher than that of the Wankel engine, as a result of intrinsic limitations of compression ratio in the Wankel machine. The RKM technology is free from such limitations.
5. The RKM technology is highly universal and adaptable and can be used in any area of application of internal combustion engines: civil and military transportation, industry, agriculture and household. It can be used also in gas and fluid pumps and in pneumatic and hydraulic engines.

As a result of my study, I have become confident that RKM technology deserves all efforts to develop it up to practical implementation and mass production. The impact of this on our national economy will be enormous and hardly can be overestimated.



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