External Combustion Open-Cycle Engine

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All known external combustion engines are closed-cycle. Thus, they require coolers that complicate the construction, increase their price, and reduce their efficiency. To remove the above-mentioned disadvantages, the external combustion open-cycle engine without cooler was proposed, which uses atmospheric air as a working medium. A more efficient construction of the external combustion engine was designed, whose essence consists in the fact that the suction valve of the small cylinder and the air exhaust valve of the large cylinder connect the cylinders with the atmosphere. This thing allows the open-cycle to be realized, that is to say atmospheric air, which is an inexhaustible product, is used as a working medium. The air is taken from atmosphere into the small cylinder, is warmed in the heater, producing mechanical work in the large cylinder and it is expelled into the atmosphere without cooling. Thereby, one of the elements of the prototype is eliminated – the cooler. Besides simplifying the construction, another advantage of this design is reducing the energy consumption for the working medium compression during the cooling. The proposed technical solution will allow the production and use of external combustion engines with high efficiency, using already known units (piston compressors, heaters etc.). In the future, it is planned to deepen the theoretical and experimental researches with the purpose to obtain optimal values for the construction and exploitation engine parameters, ensuring maximum efficiency and power density.

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