

## Title (en)

Heat engine with high efficiency attributable to temperature responsive equilibrium reactions and method for optimization

## Title (de)

Wärmekraftmaschine mit hohem Wirkungsgrad im Zusammenhang mit temperaturempfindlichen Gleichgewichtsreaktionen und Verfahren zur Optimierung

## Title (fr)

Moteur thermique à haut rendement imputable à des réactions d'équilibre réagissant à la température et procédé d'optimisation

## Publication

**EP 2899375 A1 20150729 (EN)**

## Application

**EP 15000186 A 20150123**

## Priority

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## Abstract (en)

Heat engines perform a thermodynamic cycle, making use of working fluid which increases pressure and/or volume in response to temperature, resulting in the transformation of heat into useful work. The present invention makes use of a particular type of working fluid that undergoes one or more reversible chemical reactions in response to an increase in temperature, to increase the molar quantity of fluid, producing more useful work and higher thermal efficiency than similar, conventional engines. One embodiment takes the form of a Stirling engine, with a regenerative heat exchange process which recovers most of the energy required to cause the chemical dissociation, ensuring efficiency gain. A method for selecting the working fluid, useful temperature ranges for the engine, and other operating parameters is also claimed. Other types of embodiments may take the form of turbine engines, with one embodiment being a turbine engine that approximates an Ericsson cycle.

## IPC 8 full level

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## CPC (source: EP)

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## Citation (applicant)

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