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• **Zevatsky, Yury Eduardovich**
Kiev, 252073 (UA)

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(72) Inventor: **ZEVATSKY, Yury Eduardovich**
Kiev, 252073 (UA)

(71) Applicants:
• **Khanzhina, Marina Nikolaevna**
St-Petersburg, 196135 (RU)

(74) Representative: **Epping Hermann & Fischer**
Ridlerstrasse 55
80339 München (DE)

(54) **METHOD AND DEVICE FOR COOLING A WORKING MEDIUM AND METHOD FOR GENERATING A MICROWAVE EMISSION**

(57) The invention relates to thermal physics, in particular to a method and apparatus for cooling a working medium and a method for generating microwave radiation. The object is to reduce the power consumed in the cooling process and in the conversion of electric power into electromagnetic radiation energy. A working medium, molecules of which exhibit a stable dipole moment, is placed into a closed working zone of electrical field effect, the electric field having an intensity satisfying the condition:

$$\mu E > 10^7 D \text{ V/m}$$

where: μ is the dipole moment of the working medium molecules, in Debyes (D), E is the electric field intensity, in V/m; and passage of electric current is prevented through the closed working zone. In generation of microwave radiation, exit of the microwave radiation is provided from the closed working zone of electric field effect, and heat is removed through absorption of the microwave radiation by an external coolant.

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