The United States of America

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Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

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Jon W. Dudas

Director of the United States Patent and Trademark Office

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(12) **United States Patent**
Pappas

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(54) **METHOD AND MEANS OF MULTI-ACTIVATION OF IONS AND ATOMS WITH NMR AND EPR**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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See application file for complete search history.

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(57) **ABSTRACT**

The invention uses one inductor, which is formed of one, two or a few twisted or parallel conductors, and exposes a sample object in a pulsed and damped alternating magnetic field (B) without necessarily the employment of a second, constant intensity, magnetic field. In this way, the nuclei and/or the electrons of the sample object are activated, in the presence of a non-constant magnetic field (B), that gets infinite negative and positive values between successive damped positive and negative values, crossing through the zero value during a magnetic pulse. Thus, a wide nuclear NMR and electronic EPR multiple—resonance of the sample object is achieved.

14 Claims, 8 Drawing Sheets