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(71) Applicant *(for all designated States except US)*: **ROCHE DIAGNOSTICS GMBH** [DE/DE]; 68298 Mannheim (DE).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **ANKENBAUER, Waltraud** [DE/DE]; Oberanger 18, 82377 Penzberg (DE). **LAUE, Frank** [DE/DE]; Bachaecker 11, 82396 Paehl-Fischen (DE). **SOBEK, Harald** [DE/DE]; Birkenstrasse 29, 82377 Penzberg (DE). **GREIF, Michael** [DE/DE]; Fleck 28, 83661 Lenggries (DE).

(74) Common Representative: **ROCHE DIAGNOSTICS GMBH**; Patent Department, 68298 Mannheim (DE).

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(54) Title: THERMOSTABLE ENZYME PROMOTING THE FIDELITY OF THERMOSTABLE DNA POLYMERASES- FOR IMPROVEMENT OF NUCLEIC ACID SYNTHESIS AND AMPLIFICATION *IN VITRO*

(57) Abstract: A purified thermostable enzyme is derived from the thermophilic archaebacterium *Archaeoglobus fulgidus*. The enzyme can be native or recombinant, is stable under PCR conditions and exhibits double strand specific exonuclease activity. It is a 3'-5' exonuclease and cleaves to produce 5'-mononucleotides. Thermostable exonucleases are useful in many recombinant DNA techniques, in combination with a thermostable DNA polymerase like *Tag* especially for nucleic acid amplification by the polymerase chain reaction (PCR).