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(54) Title of the Invention: **Nuclear powered internal engine nuclear fuel cycle and housing design improvements**
Abstract Title: **Nuclear powered internal engine nuclear fuel cycle and housing design improvements**

(57) A nanofuel engine including receiving nanofuel (including moderator, nanoscale molecular dimensions & molecular mixture) internally in an internal combustion engine that releases nuclear energy, is set forth. A nanofuel chemical composition of fissile fuel, passive agent, and moderator. A method of obtaining transuranic elements for nanofuel including: receiving spent nuclear fuel (SNF); separating elements from SNF, including a stream of elements with $Z > 92$, fissile fuel, passive agent, fertile fuel, or fission products; and providing elements. A method of using transuranic elements to create nanofuel, including: receiving, converting, and mixing the transuranic elements with a moderator to obtain nanofuel. A method of operating a nanofuel engine loaded with nanofuel in spark or compression ignition mode. A method of cycling a nanofuel engine, including compressing nanofuel; igniting nanofuel; capturing energy released in nanofuel, which is also the working fluid; and using the working fluid to perform mechanical work or generate heat.

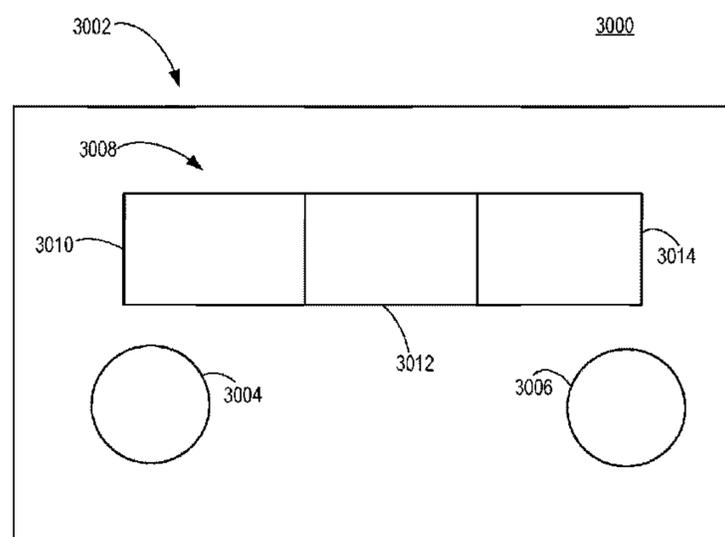


FIG. 21

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