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(54) Title: SUBSONIC AND STATIONARY RAMJET ENGINES

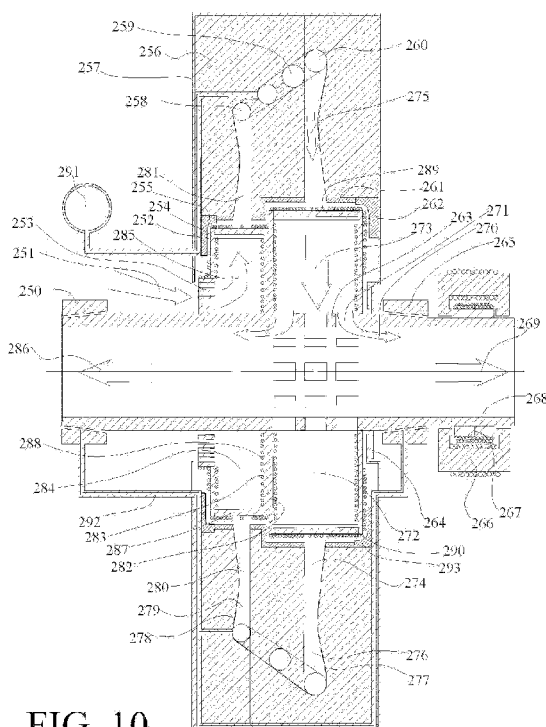


FIG. 10

(57) Abstract: A ramjet engine (3, 4, 5), flying at Mach 3 has 64% efficiency, and at Mach 4 has 76% efficiency. Ramjet engines are currently only used for supersonic flight and have not been used as stationary engines with mechanical output. The present invention, in addition to subsonic flight, can be operated as a stationary engine, and can expand the use of the ramjet engine for mechanical output in vehicles, power plants, and in generator sets for large buildings, homes, and industry. The present invention provides the means to use ramjet engines as stationary engines by building nearly adiabatic compressors (1, 2, 12, 13, 14, 15) and expanders (6, 7, 8, 9, 10, 11) capable of (de-)compression ratios up to about 92: 1 to supply the high energy gas/air required by ramjet engines, and shows how to replace de Laval nozzles with sonic converters (49, 50, 51) that convert supersonic to subsonic flow and sonic convertors (45, 46, 47) that convert subsonic to supersonic flow without having choke areas.

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