

[54] LASER SUSTAINED DISCHARGE NOZZLE APPARATUS FOR THE PRODUCTION OF AN INTENSE BEAM OF HIGH KINETIC ENERGY ATOMIC SPECIES

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[73] Assignee: The United States of America as represented by the United States Department of Energy, Washington, D.C.

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Related U.S. Application Data

[63] Continuation of Ser. No. 89,046, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 817,934, Jan. 10, 1986, abandoned.

[51] Int. Cl.<sup>4</sup> ..... B01D 59/44

[52] U.S. Cl. .... 250/281; 250/288; 250/423 P; 376/122

[58] Field of Search ..... 250/281, 282, 287, 288, 250/423 P; 60/202; 376/103, 104, 122, 144, 145; 315/111.81

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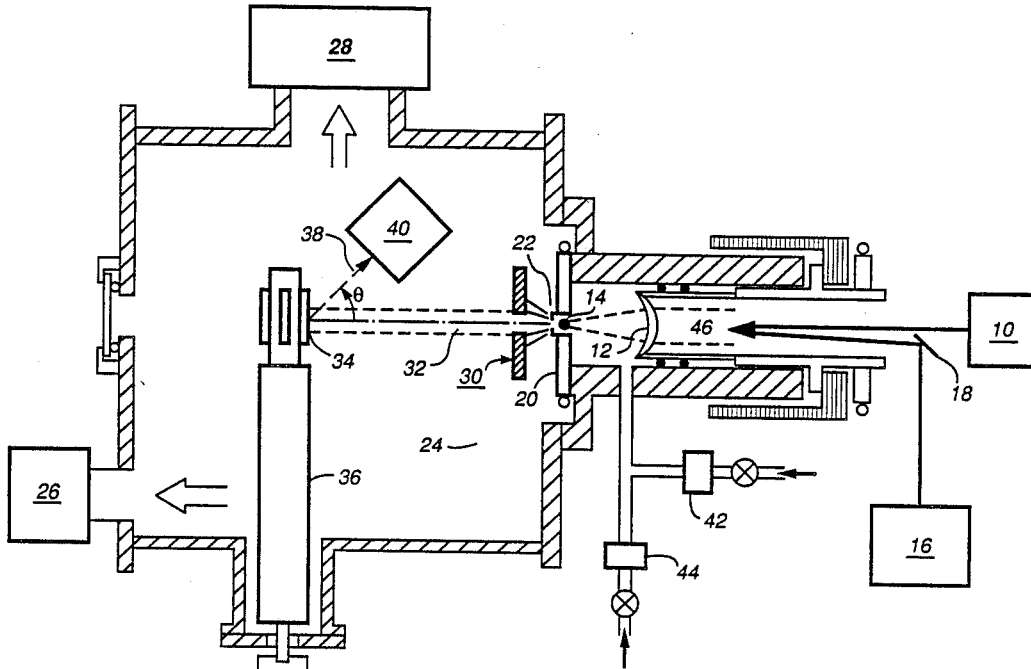
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[57] ABSTRACT

Laser sustained discharge apparatus for the production of intense beams of high kinetic energy atomic species. A portion of the plasma resulting from a laser sustained continuous optical discharge which generates energetic atomic species from a gaseous source thereof is expanded through a nozzle into a region of low pressure. The expanded plasma contains a significant concentration of the high kinetic energy atomic species which may be used to investigate the interaction of surfaces therewith. In particular, O-atoms having velocities in excess of 3.5 km/s can be generated for the purpose of studying their interaction with materials in order to develop protective materials for spacecraft which are exposed to such energetic O-atoms during operation in low earth orbit.

16 Claims, 5 Drawing Sheets



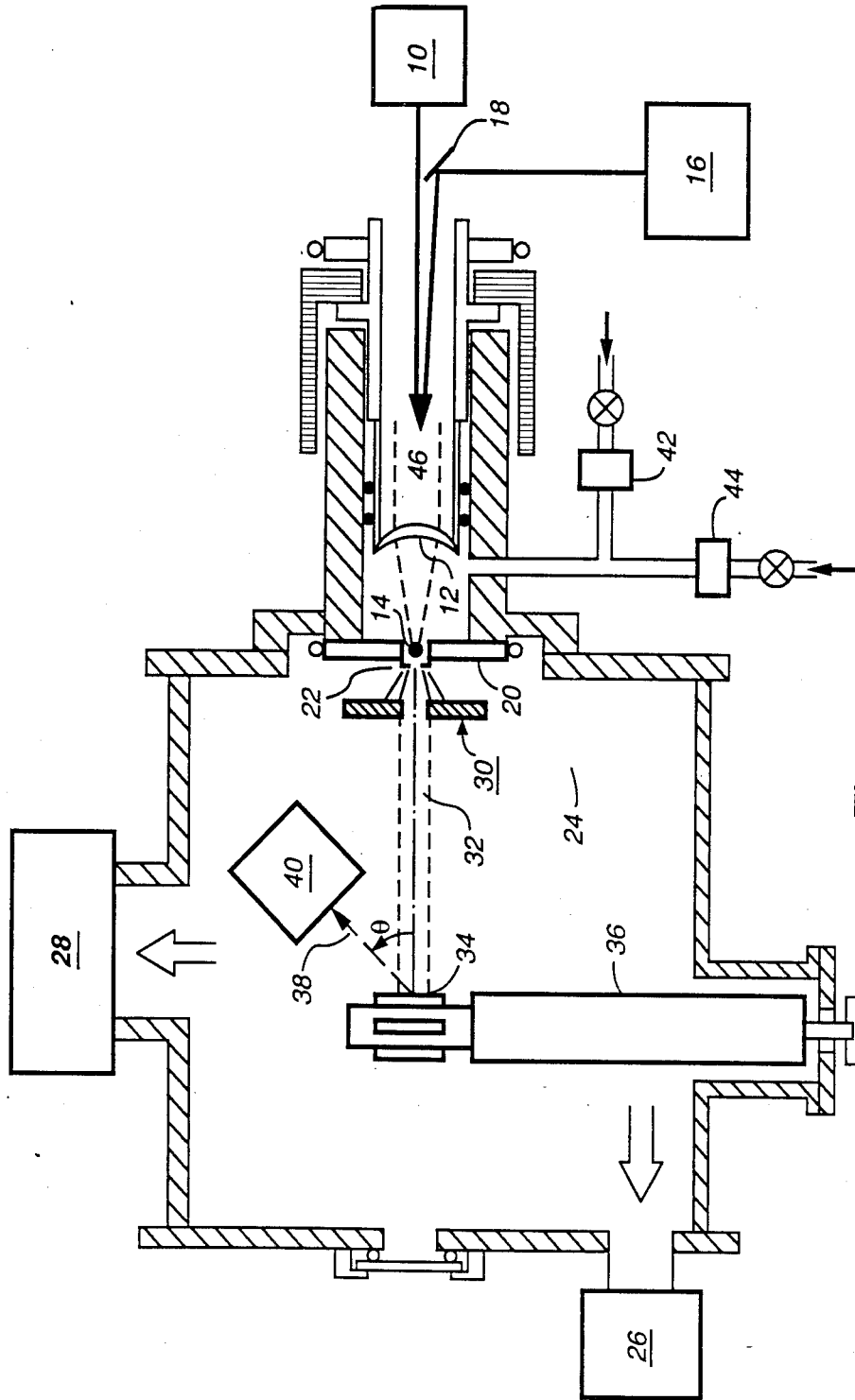


Fig. 1

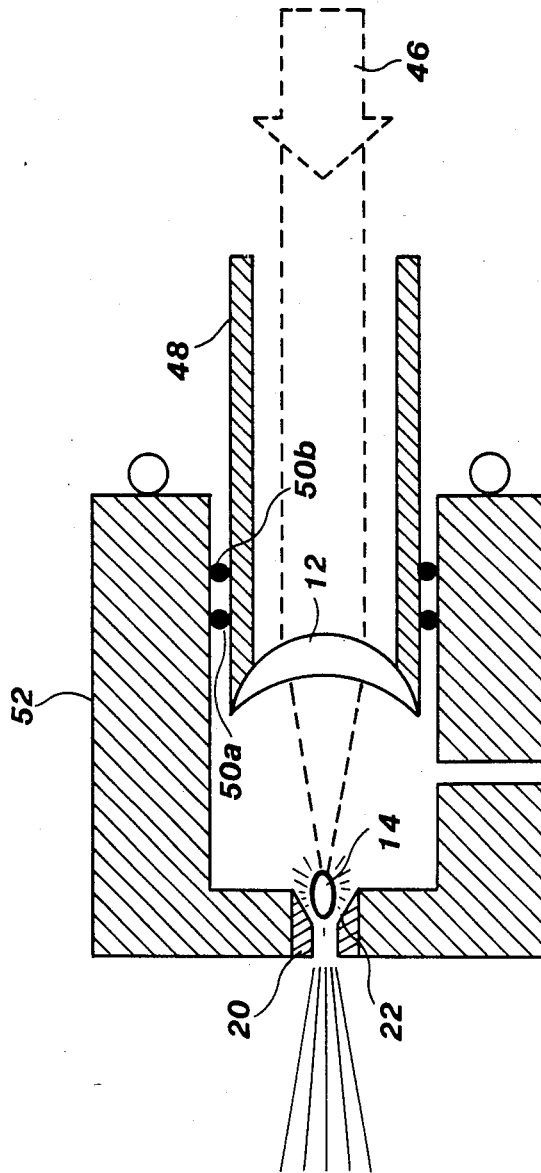
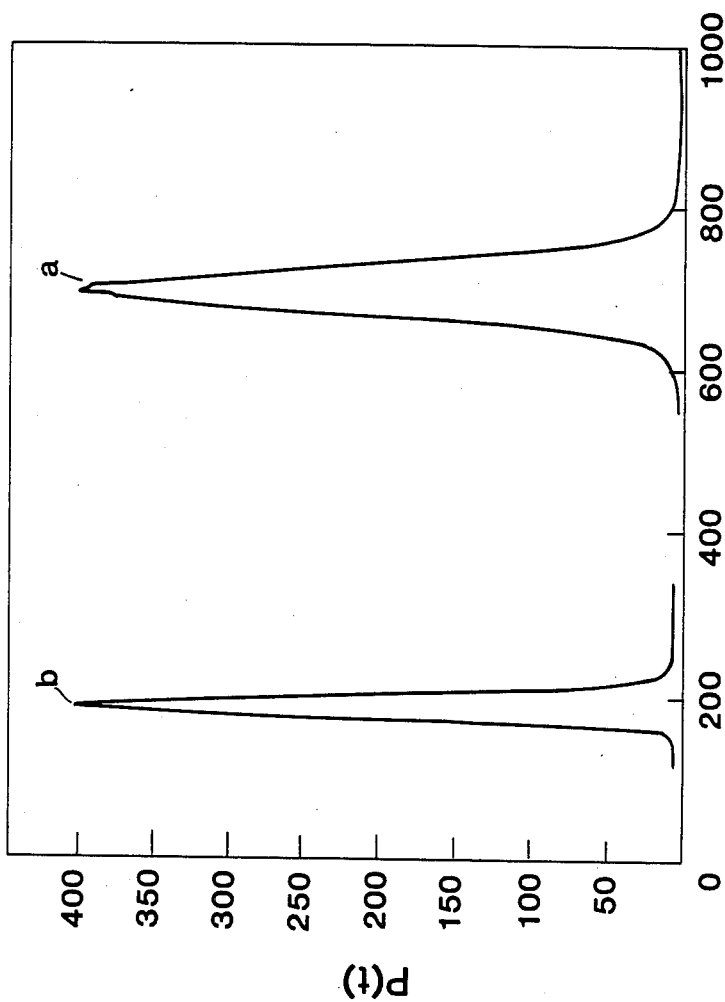


Fig. 2



FLIGHT TIME,  $t(\mu s)$

**Fig.3**

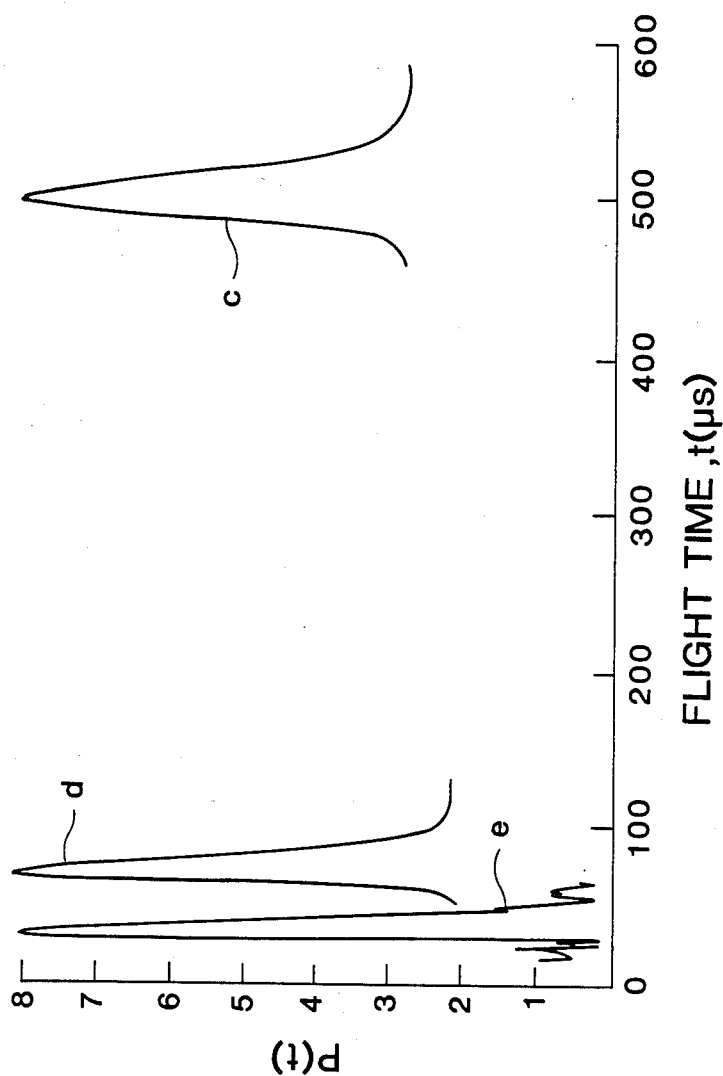


Fig. 4

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