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DRAWINGS ATTACHED

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(72) Inventor CHARLES OSMOND FREDERICK

(54) SPACE VEHICLE

(71) We, BRITISH RAILWAYS BOARD, a public authority established under the provisions of the Transport Act 1962, of 222, Marylebone Road, London, N.W.1, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a space vehicle. More particularly it relates to a power supply for a space vehicle which offers a source of sustained thrust for the loss of a very small mass of fuel. Thus it would enable very high velocities to be attained in a space vehicle and in fact the prolonged acceleration of the vehicle may in some circumstances be used to simulate gravity.

According to the present invention there is provided a space vehicle including a platform, a thermonuclear fusion zone provided at the underside of said platform, means for supplying fusion material to said zone, one or more lasers to provide for ignition of said fusion material at said fusion zone, magnetic means on said platform adapted to deflect charged particles emitted from said fusion zone and a plurality of electrodes on said platform adapted to receive charged particles emitted from said fusion zone to thereby provide a source of electrical power.

A preferred embodiment of the present invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a cross section of a space vehicle,

Figure 2 is an underside view of part of the vehicle shown in Figure 1.

The space vehicle consists of a disk or platform 10 which may have a flat, slightly concave or convex undersurface. A controlled thermonuclear fusion reaction is ignited by one or more pulsed laser beams produced by lasers 11 and reflected or focussed onto a central reaction zone 12 on the underside of the platform.

The thermonuclear fusion will take place in a series of pulses, each pulse being triggered by laser energy, and/or energetic particles reflected from a previous pulse. The system will be arranged so that the fusion process will decay after each pulse so that the stability of the system is maintained. The pulse frequency will generally be greater than 1000Hz to avoid structural vibration within the vehicle.

The fusion zone 12 will be supplied with liquid fuel pumped through a nozzle 13 at high pressure.

The vehicle contains powerful electromagnets 14, possibly superconducting magnets, whose fields will extend into the space below the vehicle. These fields will deflect charged particles produced by the thermonuclear reaction either towards the underside of the vehicle or away from it. The particles deflected towards the underside of the vehicle will be received on insulated electrodes 15 and provide a source of electric power. The particles deflected away from the vehicle will contribute to the vehicle lift by a greater amount than if they had simply ejected from the reaction point (or points).

The electrodes 15 are subdivided radially as shown into a number of sections 16 each separated by an insulating strip 17 from adjacent sections. In this way the voltage on each of the sections 16 can be different, which in certain circumstances can be advantageous as will be described.

The proportion of charged particles generated at the reaction point 12 (or points) may be modified by mixing the material subject to fusion with some other material or placing the two materials adjacent to one another. These means may also be used to increase the opacity of the fuel to the laser radiation and thereby make ignition easier.

Heavy material 18 will shield the upper part of the vehicle from the nuclear radiation emanating from the reaction zone.

In addition cooling tubes 19 absorb excess thermal energy produced by the reaction and carry this to a radiating surface 20 provided on the upper side of the disk 10.

The large burst of power necessary to energise the lasers 11 initially could be provided

by a homo-polar generator 21 involving a large spinning disc or two or more contra-rotating disks. This disc generator could be placed directly over the reaction zone 12 to assist in shielding the upperside of the vehicle from radiation. This principle could be used with multiple reaction points also. After initial start up of the device the homo-polar generator 21 could continue to spin and act as an energy storing flywheel. It may also be used as a reference level in a system for stabilizing the vehicle by varying the electrostatic voltages on the electrode sections 16 to apply a correcting couple to the vehicle.

The magnetic fields on the underside of the vehicle will protect some zones of it from charged particles. These zones could be used to situate laser devices or reflectors for laser beams, thereby ensuring a longer life for these components.

By controlling the voltages on the electrode sections 16 and also the magnitude of the magnetic fields from each of the magnets 14, by way of a suitable servo mechanism, the thrust acting on the vehicle can be vectored so that its attitude and direction of movement can be controlled.

A passenger compartment 22 can be positioned on the upper central part of the vehicle.

WHAT WE CLAIM IS:—

1. A space vehicle including a platform, a thermonuclear fusion zone provided at the underside of said platform means for supplying fusion material to said zone, one or more lasers to provide for ignition of said fusion material at said fusion zone, magnetic means on said platform adapted to deflect charged particles emitted from said fusion zone, and a plurality of electrodes on said platform adapted to receive charged particles emitted from said fusion zone to thereby provide a source of electrical power.

2. A space vehicle as claimed in claim 1 wherein the individual electrodes and the magnetic means are arranged alternately in a ring surrounding the fusion zone.

3. A space vehicle as claimed in claim 2 wherein each electrode is subdivided radially into a plurality of sections each insulated from one another.

4. A space vehicle as claimed in any preceding claim wherein an electrical generator is provided for supplying the necessary power to initiate the operation of the lasers.

5. A space vehicle as claimed in claim 4, wherein said generator is a homopolar generator.

6. A space vehicle as claimed in any preceding claim wherein thermal energy absorbing means are provided adjacent said fusion zone the arrangement being such that when the vehicle is in operation the absorbed energy is transmitted to and radiated from the upper surface of the platform.

7. A space vehicle as claimed in any preceding claim wherein servo controlled means are provided for controlling the inclination of the platform by varying the strength of the magnetic field of said magnetic means and/or the voltage on said electrodes.

8. A space vehicle substantially as described herein with reference to the accompanying drawings.

JENSEN & SON,
Agents for the Applicants,
8, Fulwood Place,
London, WC1V 6HG.
Chartered Patent Agents.

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1310990 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

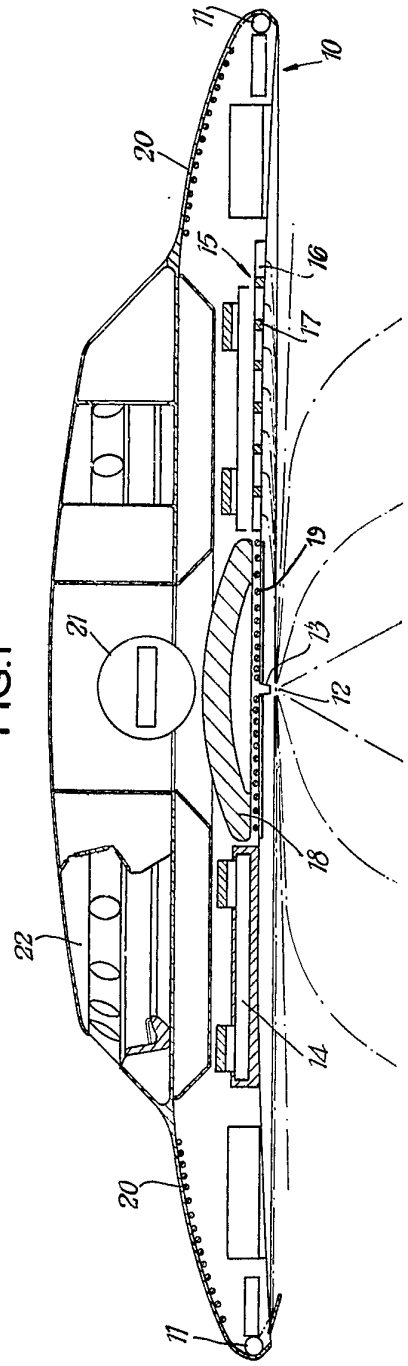

FIG.1

1310990 COMPLETE SPECIFICATION

2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheet 2

FIG.2