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NASA TECH BRIEF

Ames Research Center

Restraint and Locomotion Aid

The problem:

To devise a system which permits a person to do work in positions where gravity and friction forces cannot act as counterforces; for example, a system which holds an astronaut on the surface of a space vehicle while he works with conventional tools.

The solution:

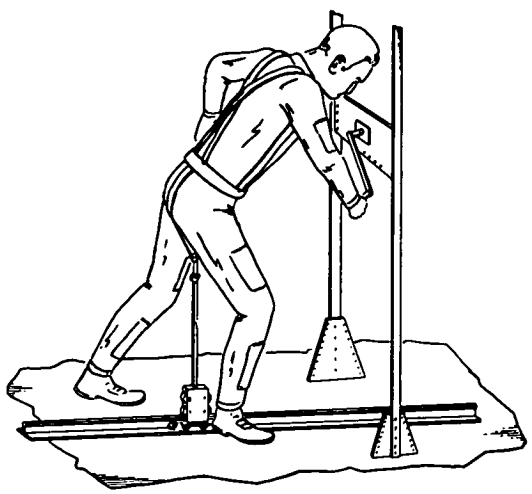
The person is tethered to a restraining device which slides along a fixed track on the surface; straps attached to a harness arrangement are constantly under spring tension so that the person can maneuver while being stabilized by the constant force which pulls him toward the surface.

How it's done:

The restraining device shown in the diagram has been designed primarily for use in space, but it may also be used on earth for hazardous operations on shipboard during stormy weather or when workmen must cover relatively long distances on ceilings, domes, or bridges. The restraining device might also be used in underwater work to overcome the tendency of the human body to float.

The restraint and locomotion aid system is composed of a tension member which is secured by hooks to a strap on the astronaut's space suit or to a harness; the other end of the tension member is fastened to a trolley. The tension member consists of a number of strips of constant-force spring metal which are contained on coils built into the trolley. The trolley is free to move along a track which is secured to the space vehicle, and any number of tracks may be secured to both the inside and outside of the vehicle.

The restraint and locomotion system permits the astronaut to function normally in a zero-gravity environment. The system eliminates the need for cumbersome tethers and inefficient techniques for loco-



motion; it also permits the astronaut to sit and work in a normal manner. The system also minimizes the need for space tools which are specially designed to balance work forces so that no reaction thrusts or torques are transmitted to the astronaut's body when he works with them.

Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
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Reference: B72-10558

(continued overleaf)

Patent status:

This invention has been patented by NASA (U.S. Patent No. 3,583,322). Inquiries concerning nonexclusive or exclusive license for its commercial development should be addressed to:

NASA Patent Counsel
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