NASA SP-7039 (45)
July 1994

P-64

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY
SECTION 1 ABSTRACTS

NASA STI PROGRAM
SCIENTIFIC & TECHNICAL INFORMATION

The NASA STI Program ... in Profile

Since its founding, NASA has been dedicated to the advancement of aeronautics and space science. The NASA Scientific and Technical Information (STI) Program plays a key part in helping NASA maintain this important role.

The NASA STI Program provides access to the NASA STI Database, the largest collection of aeronautical and space science STI in the world. The Program is also NASA's institutional mechanism for disseminating the results of its research and development activities.

Specialized services that help round out the Program's diverse offerings include creating custom thesauri, translating material to or from 34 foreign languages, building customized databases, organizing and publishing research results ... even providing videos.

For more information about the NASA STI Program, you can:

- **Phone** the NASA Access Help Desk at (301) 621-0390
- **Fax** your question to the NASA Access Help Desk at (301) 621-0134
- **E-mail** your question via the **Internet** to help@sti.nasa.gov
- **Write** to:

NASA Access Help Desk
NASA Center for AeroSpace Information
800 Elkridge Landing Road
Linthicum Heights, MD 21090-2934

NASA SP-7039 (45)
July 1994

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY
SECTION 1 INDEXES

National Aeronautics and Space Administration
Scientific and Technical Information Program
Washington, DC 1994

This publication was prepared by the NASA Center for AeroSpace Information, 800 Elkridge Landing Road, Linthicum Heights, MD 21090-2934, (301) 621-0390.

INTRODUCTION

Several thousand inventions result each year from the aeronautical and space research supported by the National Aeronautics and Space Administration. The inventions having important use in government programs or significant commercial potential are usually patented by NASA. These inventions cover practically all fields of technology and include many that have useful and valuable commercial application.

NASA inventions best serve the interests of the United States when their benefits are available to the public. In many instances, the granting of nonexclusive or exclusive licenses for the practice of these inventions may assist in the accomplishment of this objective. This bibliography is published as a service to companies, firms, and individuals seeking new, licensable products for the commercial market.

The *NASA Patent Abstracts Bibliography (NASA PAB) is* a semiannual NASA publication containing comprehensive abstracts and indexes of NASA-owned inventions covered by U.S. patents and applications for patent. The citations included in *NASA PAB* were originally published in NASA's *Scientific and Technical Aerospace Reports (STAR)* and cover *STAR* announcements made since May 1969.

For the convenience of the user, each issue of *NASA PAB* has a separately bound Abstract Section (Section 1) and Index Section (Section 2). Although each Abstract Section covers only the indicated six-month period, the Index Section is cumulative covering all NASA-owned inventions announced in *STAR* since 1969. Thus a complete set of *NASA PAB* would consist of the Abstract Sections of Issue 04 (January 1974) and Issue 12 (January 1978) and the Abstract Section for all subsequent issues and the Index Section for the most recent issue.

The 137 citations published in this issue of the Abstract Section cover the period January 1994 through June 1994. The Index Section references over 5600 citations covering the period May 1969 through June 1994.

ABSTRACT SECTION (SECTION 1)

This *PAB* issue includes 10 major subject divisions separated into 76 specific categories and one general category/division. (See Table of Contents for the scope note of each category, under which are grouped appropriate NASA inventions.) This scheme was devised in 1975 and revised in 1987 in lieu of the 34 category divisions which were utilized in *PAB* supplements (01) through (06) covering *STAR* abstracts from May 1969 through January 1974. Each entry in the Abstract Section consists of a *STAR* citation accompanied by an abstract and, when appropriate, a key illustration taken from the patent or application for patent. Entries are arranged by subject category in order of the ascending NASA Accession Number originally assigned for *STAR* to the invention. The range of NASA Accession Numbers within each issue is printed on the inside back cover.

Abstract Citation Data Elements: Each of the abstract citations has several data elements useful for identification and indexing purposes, as follows:

NASA Accession Number
NASA Case Number
Inventor's Name
Title of Invention
U.S. Patent Application Serial Number
U.S. Patent Number (for issued patents only)
U.S. Patent Office Classification Number(s)
(for issued patents only)

These data elements are identified in the Typical Citation and Abstract and in the indexes.

INDEX SECTION (SECTION 2)

The Index Section is divided into five indexes. These indexes are cross-indexed and are used to locate a single invention or groups of inventions.

Subject Index: Lists all inventions according to appropriate alphabetized technical term and indicates the related NASA Case Number, the Subject Category Number, and the Accession Number.

Inventor Index: Lists all inventions according to alphabetized names of inventors and indicates the related NASA Case Number, the Subject Category Number, and the Accession Number.

Source Index: Lists all inventions according to alphabetized source of invention (i.e., name of contractor or government installation where invention was made) and indicates the related NASA Case Number, the Subject Category Number, and the Accession Number.

Number Index: Lists inventions in order of ascending (1) NASA Case Number, (2) U.S. Patent Application Serial number, (3) U.S. Patent Classification Number, and (4) U.S. Patent Number and indicates the related Subject Category Number and the Accession Number.

Accession Number Index: Lists all inventions in order of ascending Accession Number and indicates the related Subject Category Number, the NASA Case Number, the U.S. Patent Application Serial Number, the U.S.Patent Classification Number, and the U.S. Patent Number.

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

To identify one or more NASA inventions within a specific technical field or subject, several techniques are possible with the flexibility incorporated into the *NASA PAB.*

(1) *Using Subject Category:* To identify all NASA inventions in any one of the subject categories in this issue of *NASA PAB,* select the desired Subject Category in the Abstract Section (Section 1) and find the inventions abstracted thereunder.

(2) *Using Subject Index:* To identify all NASA inventions listed under a desired technical subject index term, (A) turn to the cumulative Subject Index in the Index Section and find the invention(s) listed under the desired technical subject term. (B) Note the indicated Accession Number and the Subject Category Number. (C) Using the indicated Accession Number, turn to the inside front cover of the Index Section to determine which issue of the Abstract Section includes the Accession Number desired. (D) To find the abstract of the particular invention in the issue of the Abstract Section selected, (1) use the Subject Category Number to locate the Subject Category and (2) use the Accession Number to locate the desired invention within the Subject Category listing.

(3) *Using Patent Classification Index:* To identify all inventions covered by issued NASA patents (not including applications for patent) within a desired Patent Classification, (A) turn to the Patent Classification Number in the Number Index of Section 2 and find the associated invention(s), and (B) follow the instructions outlined in (2)(B), and (D) above.

TABLE OF CONTENTS
Section 1 • Abstracts

N.A. — no abstracts were assigned to this category for this issue.

CHEMISTRY AND MATERIALS

ENGINEERING For related information see also *Physics.*

GEOSCIENCES For related information see also *Space Sciences.*

LIFE SCIENCES

MATHEMATICAL AND COMPUTER SCIENCES

SPACE SCIENCES For related information see also *Geosciences.*

GENERAL

Includes aeronautical, astronautical, and space science related histories, biographies, and pertinent reports too broad for categorization; histories or broad overviews of NASA programs.

Section 2 • Indexes

TYPICAL CITATION AND ABSTRACT

NASA SPONSORED

ON MICROFICHE

ACCESSION NUMBER → **N94-15960*#** National Aeronautics and Space Administration. Pasadena Office, CA. ← CORPORATE SOURCE

TITLE → **SELECTIVE FORMATION OF POROUS SILICON Patent Application**

INVENTOR → JONES FATHAUER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 7 Jun. 1993 16 p

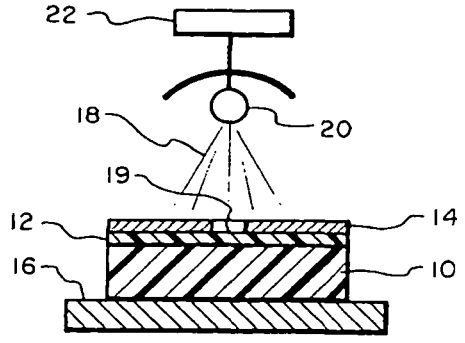
CONTRACT NUMBER → (Contract NAS7-918)

NASA CASE NUMBER AND US PATENT APPLICATION SERIAL NUMBER → (NASA-CASE-NPO-18735-1-CU; NAS 1.71:NPO-18735-1-CU; US-PATENT-APPL-SN-073019) Avail: CASI HC A03/MF A01 ← AVAILABILITY SOURCE

A pattern of porous silicon is produced in the surface of a silicon substrate by forming a pattern of crystal defects in said surface, preferably by applying an ion milling beam through openings in a photoresist layer to the surface, and then exposing said surface to a stain etchant, such as HF:HNO3:H20. The defected crystal will preferentially etch to form a pattern of porous silicon. When the amorphous content of the porous silicon exceeds 70 percent, the porous silicon pattern emits visible light at room temperature.

NASA

← ABSTRACT



← KEY ILLUSTRATION

JULY 1994 (Supplement 45)

NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

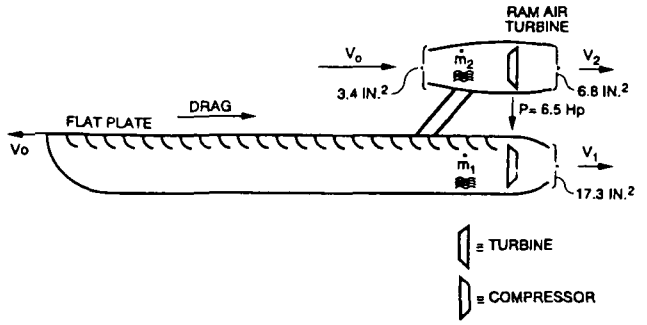
02
AERODYNAMICS

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

N94-10672*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
METHOD OF REDUCING DRAG IN AERODYNAMIC SYSTEMS Patent
FRANK J. HRACH, inventor (to NASA) 17 Aug. 1993 6 p Filed 11 Sep. 1992 Supersedes N92-34243 (30 - 24, p 4111) (NASA-CASE-LEW-14791-1; US-PATENT-5,236,155; US-PATENT-APP-SN-943659; US-PATENT-CLASS-244-208; US-PATENT-CLASS-244-130; US-PATENT-CLASS-244-209; INT-PATENT-CLASS-B64C-21/04) Avail: US Patent and Trademark Office

In the present method, boundary layer thickening is combined with laminar flow control to reduce drag. An aerodynamic body is accelerated enabling a ram turbine on the body to receive air at velocity V sub 0. The discharge air is directed over an aft portion of the aerodynamic body producing boundary layer thickening. The ram turbine also drives a compressor by applying torque to a shaft connected between the ram turbine and the compressor. The compressor sucks in lower boundary layer air through inlets in the shell of the aircraft producing laminar flow control and reducing drag. The discharge from the compressor is expanded in a nozzle to produce thrust.

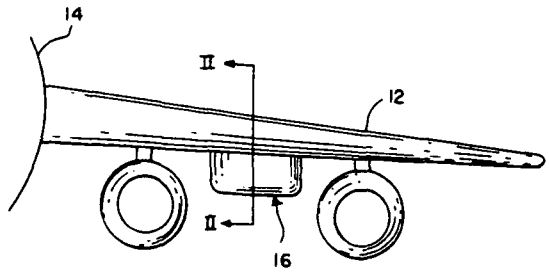
Official Gazette of the U.S. Patent and Trademark Office



N94-10673* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
UNDERWING COMPRESSION VORTEX ATTENUATION DEVICE Patent
JAMES C. PATTERSON, JR., inventor (to NASA) 27 Jul. 1993 4 p Filed 22 May 1992 Supersedes N93-19053 (31 - 6, p 1408) (NASA-CASE-LAR-14744-1; US-PATENT-5,230,486; US-PATENT-APPL-SN-886998; US-PATENT-CLASS-244-199; US-PATENT-CLASS-244-198; INT-PATENT-CLASS-B64C-23/06) Avail: US Patent and Trademark Office

A vortex attenuation device is presented which dissipates a lift-induced vortex generated by a lifting aircraft wing. The device consists of a positive pressure gradient producing means in the form of a compression panel attached to the lower surface of the wing and facing perpendicular to the airflow across the wing. The panel is located between the midpoint of the local wing cord and the trailing edge in the chord-wise direction and at a point which is approximately 55 percent of the wing span as measured from the fuselage center line in the spanwise direction. When deployed in flight, this panel produces a positive pressure gradient aligned with the final roll-up of the total vortex system which interrupts the axial flow in the vortex core and causes the vortex to collapse.

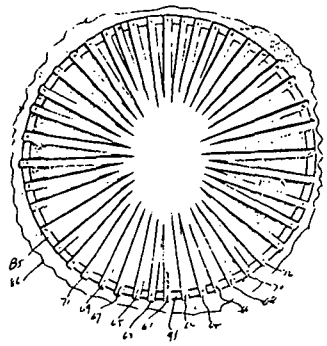
Official Gazette of the U.S. Patent and Trademark Office



N94-11021*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
PARACHUTE HAVING IMPROVED VENT LINE STACKING Patent Application.
JOHN E. HENGEL, inventor (NASA) 29 Mar. 1993 12 p (NASA-CASE-MFS-28508-1; NAS 1.71:MFS-28508-1; US-PATENT-APPL-SN-037877) Avail: CASI HC A03/MF A01

A parachute having an improved vent line stacking wherein the parachute is provided with a canopy having a central vent opening and a vent band secured to the canopy around the periphery of the vent opening, with a plurality of vent lines each lying on a diameter of the vent opening and having its ends secured to the vent band on opposite sides of the vent opening is described. The vent lines are sewed to the vent band in an order such that the end of a first vent line is sewed to the vent band at a starting point with the end of a second vent band then being sewed to the vent band adjacent to and counterclockwise from the first band. A third vent band is sewed to the vent band adjacent to and clockwise from the first band, with a fourth vent band being sewed to the vent band adjacent to and counterclockwise from the second vent band. It can be seen that, if the vent lines are numbered in the order of being sewed to the vent band, the odd numbered vent lines will run consecutively in a clockwise direction and the even numbered lines will run consecutively in a counterclockwise direction from the starting point. With this order of assembly, each and every vent line will be separated from adjacent vent lines by no more than one vent line in the center of the vent opening where the vent lines cross.

NASA



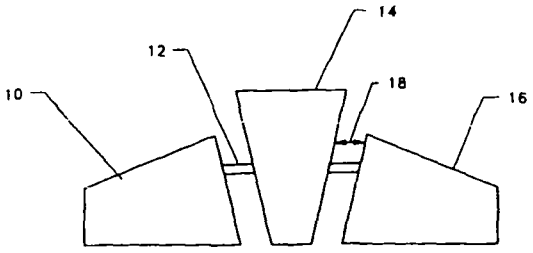
08
AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities; piloting; flight controls; and auto pilots.

N94-20556* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
APPARATUS AND METHOD FOR IMPROVING SPIN RECOVERY ON AIRCRAFT Patent
H. PAUL STOUGH, II, inventor (to NASA) 2 Nov. 1993 9 p Filed 21 Sep. 1992 Supersedes N93-20039 (31 - 7, p 1786) (NASA-CASE-LAR-14747-1; US-PATENT-5,259,573; US-PATENT-APPL-SN-948057; US-PATENT-CLASS-244-75R; US-PATENT-CLASS-244-87; INT-PATENT-CLASS-B64C-9/02) Avail: US Patent and Trademark Office

Previous research on airplane spinning and recovery has shown that at potential spin conditions (high angles of attack with rotation) the horizontal tail, depending upon its location, can create a wake about the vertical tail and rudder which can adversely affect airplane spin and recovery characteristics. Many methods of altering the tail geometry to modify these interference effects were investigated for improving airplane spin and recovery characteristics. Examples of changes includes relocation of the horizontal tail, increasing control surface travel, and use of a 'flip tail' that can be rotated to extreme angles for spin recovery. A device is provided which improves the spin recovery characteristics of aircraft which involves attaching the horizontal tail of the aircraft to the aircraft such that a gap remains between the root end of each horizontal tail section and the fuselage or vertical tail of the aircraft. The gaps measure between about 15 and 30 percent of the tail semispan. The gaps may be covered by shields which are released should a spin occur.

Official Gazette of the U.S. Patent and Trademark Office



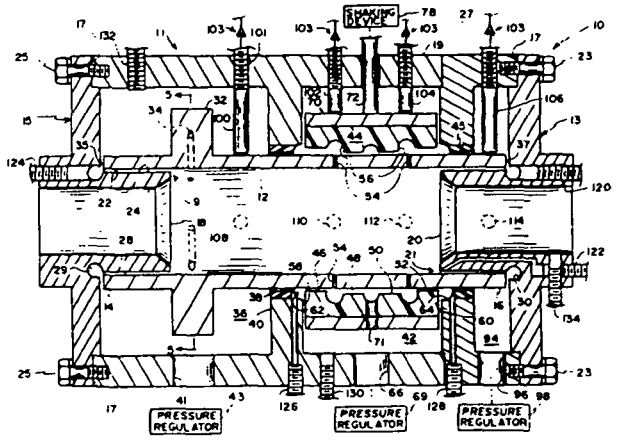
09
RESEARCH AND SUPPORT FACILITIES (AIR)

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tubes; and aircraft engine test stands.

N94-10669* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
DYNAMIC TESTER FOR ROTOR SEALS AND BEARINGS Patent
GEORGE L. VONPRAGENAU, inventor (to NASA) 31 Aug. 1993 7p Filed 1 Apr. 1991 Supersedes N91-25155 (29 - 17, p 2737) (NASA-CASE-MFS-28493-1; US-PATENT-5,239,864; US-PATENT-APPL-SN-678780; US-PATENT-CLASS-73-118.1; US-PATENT-CLASS-73-119R; US-PATENT-CLASS-73-865.9; INT-PATENT-CLASS-G01M-15/00; INT-PATENT-CLASS-G01N-9/00) Avail: US Patent and Trademark Office

A dynamic tester for testing vibration damping seals and bearings is constructed having a hollow shaft extending through the seal or bearing, with the shaft internally supported at each end by fluid bearings on hollow bosses connected to an interior of an enclosure, with no rolling members connected to the shaft is described. A high pressure working fluid is forced through the hollow bosses to operate the bearings. Additionally, the shaft is provided with a reaction turbine that angularly vents a portion of the high pressure working fluid in order to rotate the shaft at high speed, up to 40,000 rpm. The seal or bearing is mounted in a bushing, in turn supported by rods to a shaking device that vibrates the seal or bearing as the shaft is rotated. A plurality of proximity sensors are mounted from outside the enclosure to sense shaft and seal bushing vibrations, and a plurality of pressure ports are disposed in the enclosure to allow sensing of dynamic and static pressures of the testing apparatus.

Official Gazette of the U.S. Patent and Trademark Office

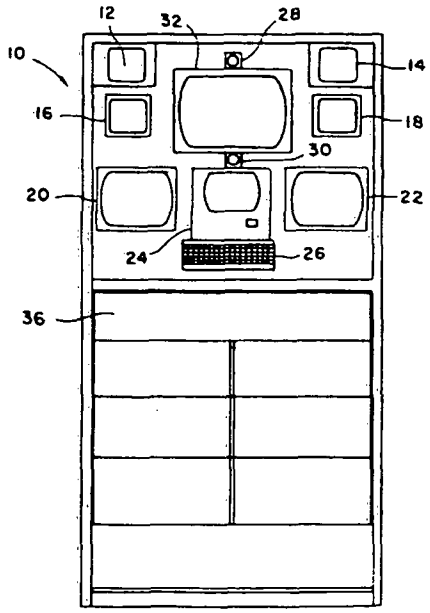


N94-23310* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
DEPLOYABLE VIDEO CONFERENCE TABLE Patent
MARC M. COHEN, inventor (to NASA) and PETER LISSOL, inventor (to NASA) 16 Nov. 1993 17 p Filed 3 Feb. 1992 (NASA-CASE-ARC-11950-1; US-PATEN-5,261,735; US-PATENT-APPL- SN-829839; US-PATENT-CLASS-312-282; US-PATENT-CLASS-108-3; US-PATENT-CLASS-108-59; INT-PATENT-CLASS-A47B-77/10) Avail: US Patent and Trademark Office

A deployable table is presented. The table is stowed in and deployed from a storage compartment based upon a non-self rigidizing, 4-hinge, arch support structure that folds upon itself to stow and that expands to deploy. The work surfaces bypass each other above and below to allow the deployment mechanism to operate. This assembly includes the following: first and second primary pivot hinges placed at the opposite ends of the storage compartment; first and second lateral frame members with proximal ends connected to the first and second pivot hinges; a medial frame member offset from and pivotally connected to distal ends of the first and second members through third and fourth medial pivot hinges; and left-side, right-side, and middle trays connected respectively to

the first, second, and third frame members and being foldable into and out of the storage compartment by articulation of the first, second, third, and fourth joints. At least one of the third and fourth joints are locked to set the first, second, and third frame members in a desired angular orientation with respect to each other.

Official Gazette of the U.S. Patent and Trademark Office



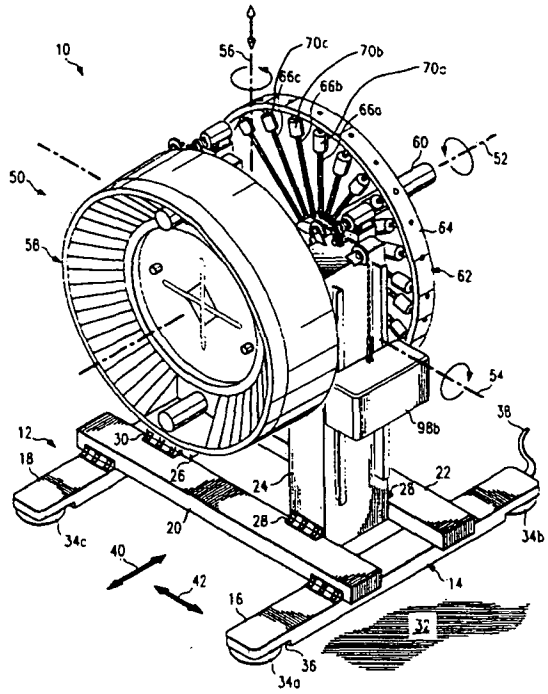
14
GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE)

Includes launch complexes, research and production facilities; ground support equipment, e.g., mobile transporters; and simulators.

N94-20339* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
APPARATUS FOR SIMULATING AN EXOATMOSPHERIC STRUCTURE Patent
ROBERT LYNN HARVEY,, inventor (to NASA) 16 Nov. 1993 14 p Filed 17 Feb. 1993 Supersedes N93-22016 (31 - 8, p 2169) (NASA-CASE-MSC-21975-1; US-PATENT-5,261,819; US-PATENT-APPL-SN-018844; US-PATENT-CLASS-434-34; INT-PATENT-CLASS-G09B-9/08) Avail: US Patent and Trademark Office

Apparatus for simulating an exoatmospheric structure, such as a spin stabilized satellite, in an environment subject to gravitational forces is presented. The apparatus includes a floating structure which is pivotally and rotationally supported upon a gimballed bearing structure positioned adjacent to the center of mass of the floating structure and suspended upon a support structure. The floating structure is translatable in either vertical direction relative to the supporting structure upon a vertically movable suspension system connected to the supporting structure. The supporting structure isprovided with bearing assemblies which are adapted to engage a supporting surface for permitting freedom of movement of the supporting structure over the supporting structure in any direction.

Official Gazette of the U.S. Patent and Trademark Office



16
SPACE TRANSPORTATION

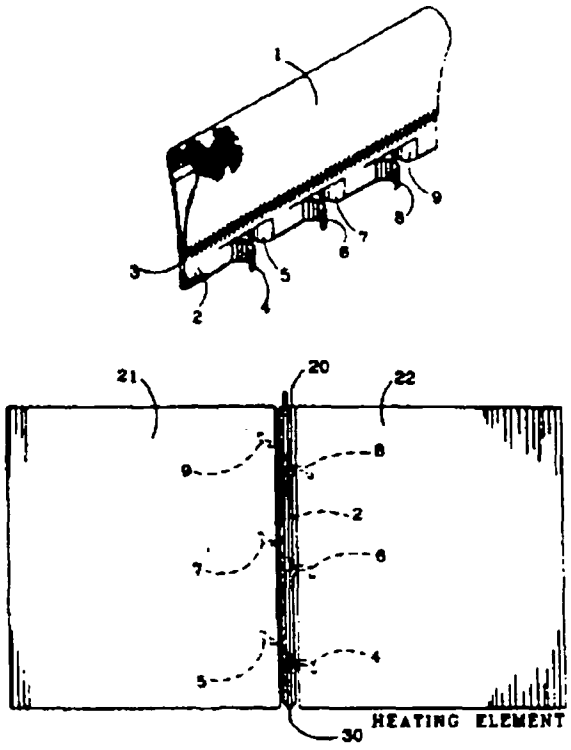
Includes passenger and cargo space transportation, e.g., shuttle operations; andspace rescue techniques.

N94-20304* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
THERMALLY ACTIVATED RETAINER MEANS UTILIZING SHAPE MEMORY ALLOY Patent
MARGARET E. GRIMALDI, inventor (to NASA) and LESLIE S. HARTZ, inventor (to NASA) 19 Oct. 1993 8 p Filed 19 Apr. 1993 Supersedes N91-28186 (29 - 20, p 3289) Continuation of abandoned US-Patent-Appl-SN-731829, filed 15 Jul. 1991 (NASA-CASE-MSC-21793-1; US-PATENT-5,254,837; US-PATENT-APPL-SN-049648; US-PATENT-APPL-SN-731829; US-PATENT-CLASS-219-200; US-PATENT-CLASS-244-158A; US-PATENT-CLASS-244-121; US-PATENT-CLASS-411-909; US-PATENT-CLASS-403-408.1; US-PATENT- CLASS-403-404) Avail: US Patent and Trademark Office

A retainer member suitable for retaining a gap filler placed in gaps between adjacent tile members is presented. One edge of the retainer member may be attached to the gap filler and another edge may be provided with a plurality of tab members which in an intermediate position do not interfere with placement or removal of the gap filler between tile members. The retainer member may be fabricated from a shape memory alloy which when heated to a specified memory temperature will thermally activate the tab mem-

bers to predetermined memory positions engaging the tile members to retain the gap filler in the gap. This invention has particular application to the thermal tiles on space vehicles such as the Space Shuttle Orbiter.

Official Gazette of the U.S. Patent and Trademark Office



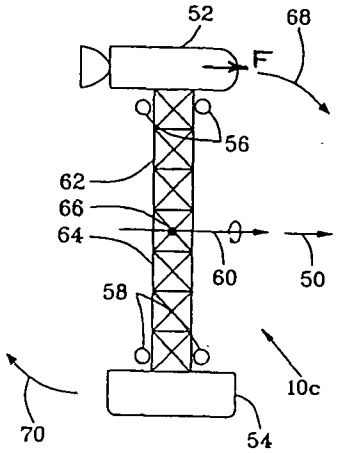
18
SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes satellites; space platforms; space stations; spacecraft systems and components such as thermal and environmental con trols; and attitude controls.

N94-15935*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
APPARATUS AND METHOD FOR PRODUCING AN ARTIFICIAL GRAVITATIONAL FIELD Patent Application
JASON MCCANNA, inventor (to NASA) 3 Jun. 1993 24 p (NASA-CASE-MSC-22021-1;NAS 1.71:MSC-22021-1; US-PATENT-APPL-SN-073847) *Avail: CASI HC A03/MF A01*

An apparatus and method is disclosed for producing an artificial gravitational field in a spacecraft by rotating the same around a spin axis. The centrifugal force thereby created acts as an artificial gravitational force. The apparatus includes an engine which produces a drive force offset from the spin axis to drive the spacecraft towards a destination. The engine is also used as a counterbalance for a crew cabin for rotation of the spacecraft. Mass of the spacecraft, which may include either the engine or crew cabin, is shifted such that the centrifugal force acting on that mass is no longer directed through the center of mass of the craft. This off-center centrifugal force creates a moment that counterbalances the moment produced by the off-center drive force to eliminate unwanted rotation which would otherwise be precipitated by the offset drive force.

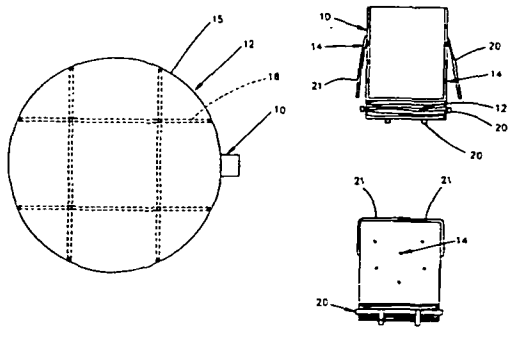
NASA



N94-20367* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
SPACE STATION TRASH REMOVAL SYSTEM Patent
ANDREW J. PETRO, inventor (to NASA) 7 Sep. 1993 5 p *Filed* 22 May 1992 Supersedes N92-30315 (30 - 21, p 3588) (NASA-CASE-MSC-21723-1; US-PATENT-5,242,134; US-PATENT-APPL-SN-887001; US-PATENT-CLASS-244-158R; US-PATENT-CLASS-244-160; INT-PATENT-CLASS-B64G-1/22) Avail: US Patent and Trademark Office

A trash removal system for space stations is described. The system is comprised of a disposable trash bag member and an attached, compacted large, lightweight inflatable balloon element. When the trash bag member is filled, the astronaut places the bag member into space through an airlock. Once in the vacuum of space, the balloon element inflates. Due to the large cross-sectional area of the balloon element relative to its mass, the combined balloon element and the trash bag member are slowed by atmospheric drag to a much greater extent than the Space Station's. The balloon element and bag member lose altitude and re-enter the atmosphere, and the elements and contents are destroyed by aerodynamic heating. The novelty of this system is in the unique method of using the vacuum of space and aerodynamic heating to dispose of waste material with a minimum of increase in orbital debris.

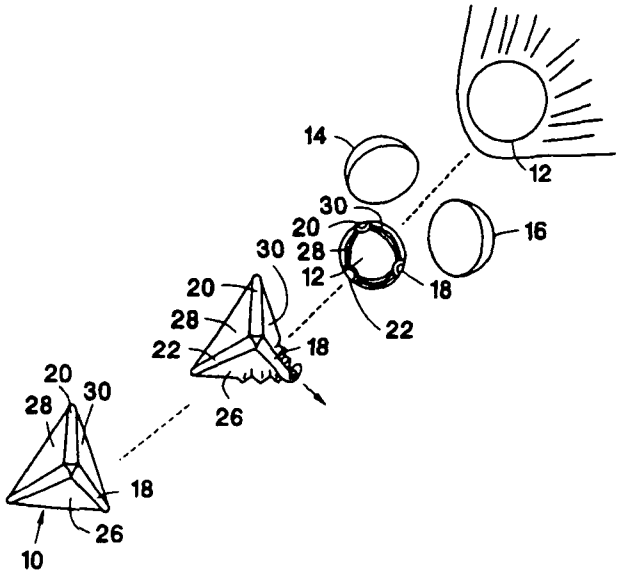
Official Gazette of the U.S. Patent and Trademark Office



N94-20590* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
TETRAHEDRAL LANDER Patent
MICHAEL L. ROBERTS, inventor (to NASA) 30 Nov. 1993 7 p Filed 3 Feb.1993 Supersedes N94-15951(32-3, p 886) (NASA-CASE-MSC-22082-1;US-PATENT-5,265,829;US-PATENT-APPL-SN-012839;US-PATENT-CLASS-244-160; US-PATENT-CLASS-244-138A;US-PATENT-CLASS-244-100A; US-PATENT-CLASS-244-110D;US-PATENT-CLASS-244-113; US-PATENT-CLASS-244-158A;US-PATENT-CLASS-244-138R) Avail: US Patent and Trademark Office

An apparatus and method is disclosed for decelerating and absorbing impact of a re-entry vehicle suitable for payloads that are relatively light as well as payloads weighing several tons or more. The apparatus includes four inflatable legs displaced equidistantly from each other around a capsule or housing which contains a payload. The legs are inflated at a designated altitude after entering earth's atmosphere to slow the descent of the re-entry vehicle. Connected between each of the four legs are drag inducing surfaces that deploy as the legs inflate. The drag inducing surfaces are triangularly shaped with one such surface being connected between each pair of legs for a total of six drag inducing surfaces. The legs have drag inducing outer surfaces which act to slow the descent of the re-entry vehicle.

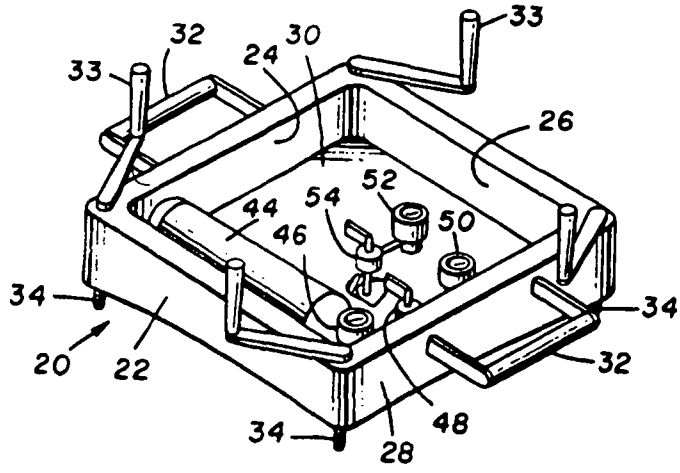
Official Gazette of the U.S. Patent and Trademark Office



N94-23824* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
PRESSURE WALL PATCH Patent
JOEL E. WILLIAMSEN, inventor (to NASA) and BRUCE C. WEDDENDORF, inventor (to NASA) 18 Jan. 1994 7 p Filed 15 Oct. 1992 Supersedes N93-17061 (31 - 5, p 1088) (NASA-CASE-MFS-28724-1; US-PATENT-5,279,092; US-PATENT-APPL-SN-961293; US-PATENT-CLASS-52-514; US-PATENT-CLASS-114-227; INT-PATENT-CLASS-E02D-37/00) Avail: US Patent and Trademark Office

A rigid patch body for placing over a damaged portion (hole) of an external wall of a pressurized vessel, such as a space vehicle or a habitat, is discussed. The rigid patch body allows an astronaut to make temporary repairs to the pressurized vessel from the exterior of the vessel, which enables more permanent repairs to be made from the interior of the vessel. The pressure wall patch of the present invention includes a floor surrounded by four side members. Each side member includes a threaded screw for anchoring the patch body to the external wall of the pressurized vessel and a recess in its lower surface for supporting an inflatable bladder for surrounding the damaged portion (hole) of the external wall to seal the area surrounding the damaged portion. This allows the vessel to be repressurized. The floor of the rigid patch body supports a source of gas that is connected to the gas supply valve and a gas supply gauge in communication with the gas supply valve and the inflatable bladder.

Official Gazette of the U.S. Patent and Trademark Office



20
SPACECRAFT PROPULSION AND POWER

Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.

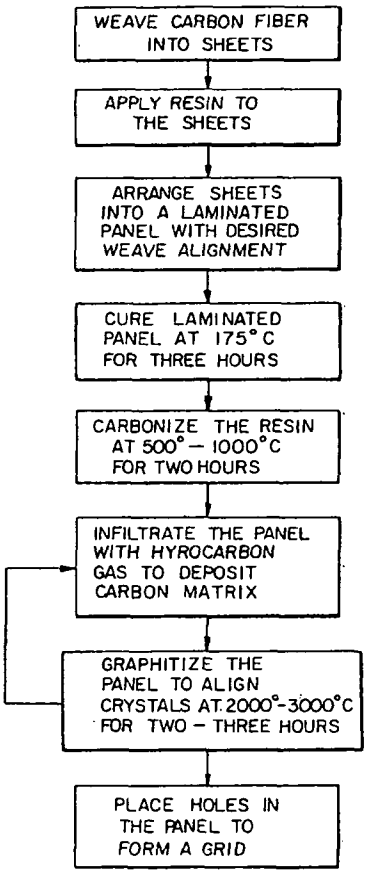
N94-15876*# National Aeronautics and Space Administration. Pasadena Office, CA.
CARBON-CARBON GRID FOR ION ENGINES Patent Application
CHARLES E. GARNER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 1 Jul. 1993 23 p (Contract NAS7-918)
(NASA-CASE-NPO-19174-1-CU; NAS 1.71:NPO-19174-1-CU; US-PATENT-APPL-SN-089064) Avail: CASI HC A03/MF A01

A method and apparatus of manufacturing a grid member for use in an ion discharge apparatus provides a woven carbon fiber in a matrix of carbon. The carbon fibers are orientated to provide a

negatibe coefficient of thermal expansion for at least a portion of the grid member's operative range of use.

NASA

FIG. 6



N94-15947*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

SHOCK-FREE SUPERSONIC ELLIPTIC NOZZLES AND METHOD OF FORMING SAME Patent Application

JOHN M. SEINER, inventor (to NASA) and ROY S. BATY, inventor (to NASA) 19 Jul. 1993 20 p

(NASA-CASE-LAR-14054-1; NAS 1.71:LAR-14054-1; US-PATENT-APPL-SN-095563) Avail: CASI HC A03/MF A01

A method of forming a shock-free supersonic elliptic nozzle, in which the nozzle to be designed is divided into three sections, a circular-to-elliptic section which begins at a circular nozzle inlet, an elliptic subsonic section downstream from the circular-to-elliptic section, and a supersonic section downstream from the elliptic subsonic section is described. The maximum and minimum radii for each axial point in the circular-to-elliptic section and the elliptic subsonic section are then separately determined, the maximum and minimum radii being the radii for the widest part of an elliptic cross-section and the narrowest part of the elliptic cross-section, respectively. The maximum and minimum radii for each axial point in the supersonic section are determined based on the Method of Characteristics. Then, each of the three sections are based on the maximum and minimum radii for each axial point in the section. The resulting nozzle is acoustically superior.

NASA

FIG. 1(a)

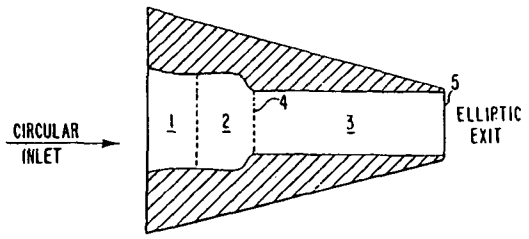
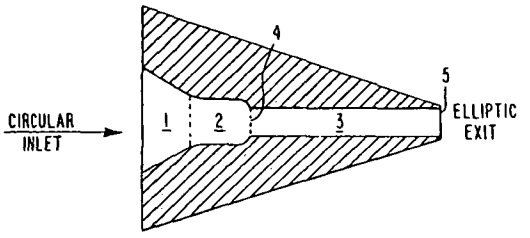


FIG. 1(b)



N94-20370* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

LIQUID FUEL INJECTION ELEMENTS FOR ROCKET ENGINES Patent

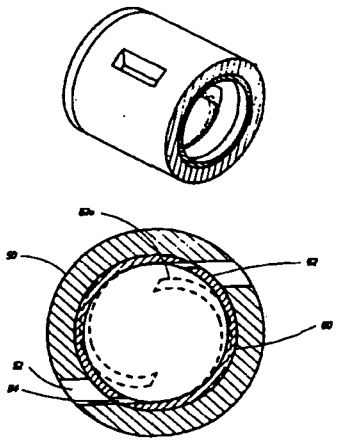
GEORGE B. COX, JR., inventor (to NASA). 30 Nov. 1993 7 p Filed 27 Jan. 1993 Supersedes N93-29847 (31 - 11, p 3289)

(NASA-CASE-MFS-28547-1; US-PATENT-5,265,415; US-PATENT-APPL-SN-010037; US-PATENT-CLASS-60-258; US-PATENT-CLASS-60-741; US-PATENT-CLASS-137-853; US-PATENT-CLASS-137-855; US-PATENT-CLASS-239-410; US-PATENT-CLASS-239-533.2; INT-PATENT-CLASS-F02K-9/00) Avail: US Patent and Trademark Office

Thrust chambers for liquid propellant rocket engines include three principal components. One of these components is an injector which contains a plurality of injection elements to meter the flow of propellants at a predetermined rate, and fuel to oxidizer mixture ratio, to introduce the mixture into the combustion chamber, and to cause them to be atomized within the combustion chamber so that even combustion takes place. Evolving from these injectors are tube injectors. These tube injectors have injection elements for injecting the oxidizer into the combustion chamber. The oxidizer and fuel must be metered at predetermined rates and mixture ratios in order to mix them within the combustion chamber so that combustion takes place smoothly and completely. Hence tube injectors are subject to improvement. An injection element for a liquid propellant

rocket engine of the bipropellant type is provided which includes tangential fuel metering orifices, and a plurality of oxidizer tube injection elements whose injection tubes are also provided with tangential oxidizer entry slots and internal reed valves.

Official Gazette of the U.S. Patent and Trademark Office



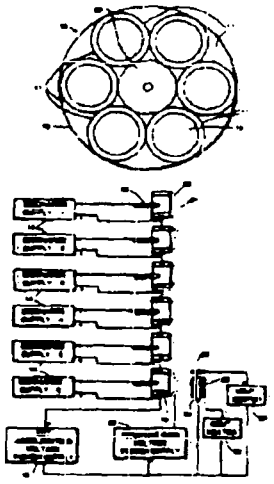
N94-20496* National Aeronautics and Space Administration. Pasadena Office, CA.

SEGMENTED ION THRUSTER Patent

JOHN R. BROPHY, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 14 Dec. 1993 15 p Filed 25 Aug. 1992 Supersedes N94-15927 (32 - 3, p 925)
(NASA-CASE-NPO-18192-1-CU; US-PATENT-5,269,131; US-PATENT-APPL-SN-934988; US-PATENT-CLASS-60-202; INT-PATENT-CLASS-H05H-1/00) Avail: US Patent and Trademark Office

Apparatus and methods for large-area, high-power ion engines comprise dividing a single engine into a combination of smaller discharge chambers (or segments) configured to operate as a single large-area engine. This segmented ion thruster (SIT) approach enables the development of 100-kW class argon ion engines for operation at a specific impulse of 10,000 s. A combination of six 30-cm diameter ion chambers operating as a single engine can process over 100 kW. Such a segmented ion engine can be operated from a single power processor unit.

Official Gazette of the U.S. Patent and Trademark Office



23

CHEMISTRY AND MATERIALS (GENERAL)

N94-20540* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

POLYBENZOXAZOLE VIA AROMATIC NUCLEOPHILIC DISPLACEMENT Patent

PAUL M. HERGENROTHER, inventor (to NASA), JOHN W. CONNELL, inventor (to NASA), and JOSEPH G. SMITH, JR., inventor (to NASA) 14 Dec. 1993 10 p Filed 10 Apr. 1992 Supersedes N93-23077 (31 - 8, p 2207)
(NASA-CASE-LAR-14606-1-CU; US-PATENT-5,270,432; US-PATENT-APPL-SN-867864; US-PATENT-CLASS-528-128; US-PATENT-CLASS-528-125; US-PATENT-CLASS-528-126; US-PATENT-CLASS-528-167; US-PATENT-CLASS-528-171; US-PATENT-CLASS-528-172; US-PATENT-CLASS-528-174) Avail: US Patent and Trademark Office

Polybenzoxazoles (PBO) are heterocyclic macromolecules which were first synthesized in a two-step process by the initial formation of aromatic diacid chlorides with bis(o-aminophenol)s through solution condensation of aromatic diacid chlorides with bis(o-aminophenol)s followed by thermal cyclodehydration. Since then several methods were utilized in their synthesis. The most common synthetic method for PBO involves a polycondensation of bis(o-aminophenol)s with aromatic diacid diphenyl esters. Another preparative route involves the solution polycondensation of the hydrochloride salts of bis(o-amino phenol)s with aromatic diacids in polyphosphoric acid. Another synthetic method involves the initial formation of poly(o-hydroxy amide)s from silylated bis (o-aminophenol)s with aromatic diacid chlorides followed by thermal cyclodehydration to PBO. A recent preparative route involves the reaction of aromatic bisphenols with bis(fluorophenyl) benzoxazoles by the displacement reaction to form PBO. The novelty of the present invention is that high molecular weight PBO of new chemical structures are prepared that exhibit a favorable combination of physical and mechanical properties.

Official Gazette of the U.S. Patent and Trademark Office

24

COMPOSITE MATERIALS

Includes physical, chemical, and mechanical properties of laminates and other composite materials.

N94-15878*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

METHOD AND APPARATUS FOR NON-DESTRUCTIVE EVALUATION OF COMPOSITE MATERIALS WITH CLOTH SURFACE IMPRESSIONS Patent Application

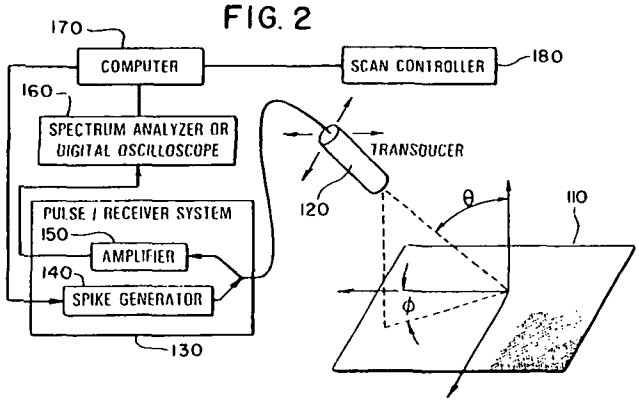
ERIC IRVINE MADARAS, inventor (to NASA) 16 Aug. 1993 36 p
(NASA-CASE-LAR-14535-1; NAS 1.71:LAR-14535-1; US-PATENT-APPL-SN-110278) Avail: CASI HC A03/MF A01

A method and related apparatus for non-destructive evaluation of composite materials by determination of the quantity known as Integrated Polar Backscatter, which avoids errors caused by surface texture left by cloth impressions by identifying frequency

ranges associated with peaks in a power spectrum for the backscattered signal, and removing such frequency ranges from the calculation of Integrated Polar Backscatter for all scan sites on the composite material is presented.

NASA

FIG. 2



N94-15926*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

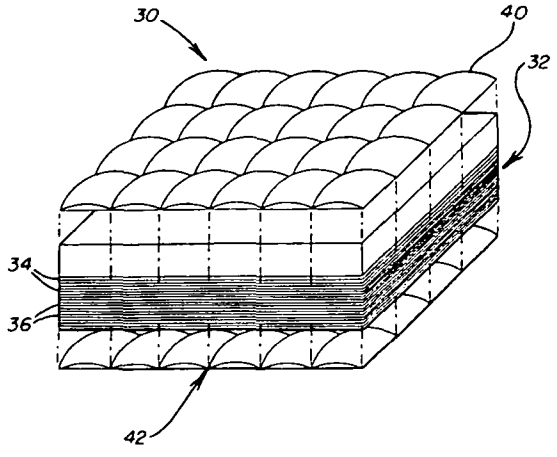
IMPROVED COMPOSITE FLEXIBLE BLANKET INSULATION Patent Application

DEMETRIUS A. KOURTIDES, inventor (to NASA) and DAVID M. LOWE, inventor (to NASA) (San Jose State Univ., Moffett Field, CA.) 1 Aug. 1991 53 p

(NASA-CASE-ARC-11955-1-CU; NAS 1.71: ARC-11955-1-CU; US-PATENT-APPL-SN-739026) Avail: CASI HC A04/MF A01

An improved composite flexible blanket insulation is presented comprising top silicon carbide having an interlock design, wherein the reflective shield is composed of single or double aluminized polyimide and wherein the polyimide film has a honeycomb pattern.

NASA



N94-15929*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

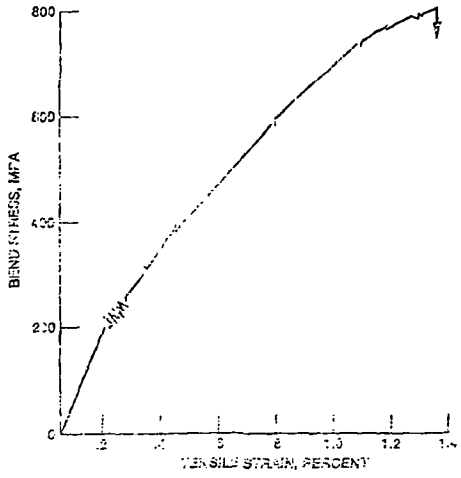
METHOD OF PRODUCING A SILICON CARBIDE FIBER REINFORCED STRONTIUM ALUMINOSILICATE GLASS-CERAMIC MATRIX COMPOSITE Patent Application

NAROTTAM P. BANSAL, inventor (to NASA) 16 Sep. 1993 9 p

(NASA-CASE-LEW-15263-2; NAS 1.71:LEW-15263-2; US-PATENT-APPL-SN-128007) Avail: CASI HC A02/MF A01

A SrO-Al2O3 - 2SrO2 (SAS) glass ceramic matrix is reinforced with CVD SiC continuous fibers. This material is prepared by casting a slurry of SAS glass powder into tapes. Mats of continuous CVD-SiC fibers are alternately stacked with the matrix tapes. This tape-mat stack is warm-pressed to produce a 'green' composite. Organic constituents are burned out of the 'green' composite, and the remaining interim material is hot pressed.

NASA



N94-20539* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

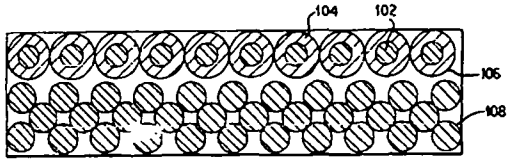
INTERCALATED HYBRID GRAPHITE FIBER COMPOSITE Patent

JAMES R. GAIER, inventor (to NASA) 9 Nov. 1993 6 p Filed 25 Nov. 1991 Supersedes N92-17861 (30 - 8, p 1257)

(NASA-CASE-LEW-15241-1; US-PATENT-5,260,124; US-PATENT-APPL-SN-798464; US-PATENT-CLASS-428-257; US-PATENT-CLASS-244-1A; US-PATENT-CLASS-361-218; US-PATENT-CLASS-428-260; US-PATENT-CLASS-428-288; US-PATENT-CLASS-428-289; US-PATENT-CLASS-428-334) Avail: US Patent and Trademark Office

The invention is directed to a highly conductive lightweight hybrid material and methods of producing the same. The hybrid composite is obtained by weaving strands of a high strength carbon or graphite fiber into a fabric-like structure, depositing a layer of carbon onto the structure, heat treating the structure to graphitize the carbon layer, and intercalating the graphitic carbon layer structure. A laminate composite material useful for protection against lightning strikes comprises at least one layer of the hybrid material over at least one layer of high strength carbon or graphite fibers. The composite material of the present invention is compatible with matrix compounds, has a coefficient of thermal expansion which is the same as underlying fiber layers, and is resistant to galvanic corrosion in addition to being highly conductive. These materials are useful in the aerospace industry, in particular as lightning strike protection for airplanes.

Official Gazette of the U.S. Patent and Trademark Office



27
NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N94-15879*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
COMPOUNDS CONTAINING META-BIPHENYLENEDIOXY MOIETIES AND POLYMERS THEREFROM Patent Application
TERRY L. ST.CLAIR, inventor (to NASA) and JOHN RICHARD PRATT, inventor (to NASA) (Lockheed Engineering and Sciences Co., Hampton, VA.) 13 May 1993 16 p
(NASA-CASE-LAR-14517-1; NAS 1.71:LAR-14517-1; US-PATENT-APPL-SN-062861) Avail: CASI HC A03/MF A01

Two monomers containing meta-biphenylenedioxy moieties were prepared. One monomer, a diamine, is used to prepare polyimide, polyamide, and epoxy polymers. The other monomer, a dianhydride, was used to prepare polyimide polymers. These polymers are used to make films, coatings, and selective membranes.

NASA

N94-15880*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
STRUCTURES FROM LOW DIELECTRIC POLYIMIDES Patent Application
ANNE K. ST.CLAIR, inventor (to NASA), TERRY L. ST.CLAIR, inventor (to NASA), and WILLIAM P. WINFREE, inventor (to NASA) 28 Sep. 1992 31 p
(NASA-CASE-LAR-14988-1; NAS 1.71: LAR-14988-1; US-PATENT-APPL-SN-954108) Avail: CASI HC A03/MF A01

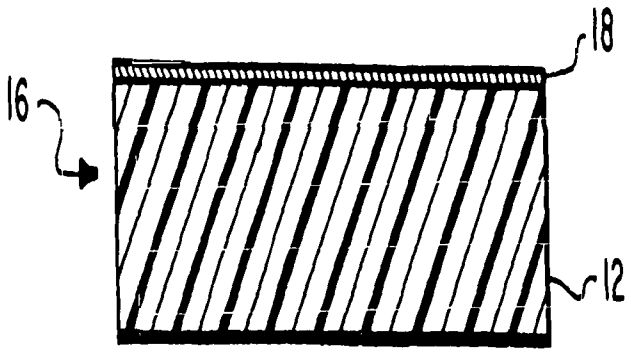
A structure which is effective as an electrical insulator or as a transmitter-receiver of electromagnetic energy is prepared by providing a suitable substrate and covering the substrate with an adhering layer of a low dielectric, high temperature, linear aromatic polyimide. This polyimide is prepared by selecting aromatic diamine and aromatic dianhydride reactants to meet at least two of the following three conditions: a reactant must have minimal permanent or inducible electrical dipolar characteristics as a result of the presence of pendant or bridging groups therein, a reactant must impart a high degree of free volume to the polymer caused by inefficient chain packing therein in the solid state as a result of the presence of pendant or bridging groups therein, and a reactant must have fluorine atoms chemically attached thereto; and chemically combining equimolar quantities of the aromatic diamine and aromatic dianhydride reactants in a solvent to form a high molecular weight polyamic acid solution, and converting the high molecular weight polyamic acid to the corresponding low dielectric, high temperature linear aromatic polyimide.

NASA

N94-15930*# National Aeronautics and Space Administration. Pasadena Office, CA.
CYANORESIN, CYANORESIN/CELLULOSE TRIACETATE BLENDS FOR THIN FILM, DIELECTRIC CAPACITORS Patent Application
SHIAO-PING YEN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and T. RICHARD JOW, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 28 May 1993 17 p
(Contract NAS7-918)
(NASA-CASE-NPO-18913-1-CU; NAS 1.71:NPO-18913-1-CU; US-PATENT-APPL-SN-073015) Avail: CASI HC A03/MF A01

Non-brittle dielectric films are formed by blending a cyanoresin such as cyanoethyl, hydroxyethyl cellulose (CRE) with a compatible, more crystalline resin such as cellulose triacetate. The electrical breakdown strength of the blend is increased by orienting the films by uniaxial or biaxial stretching. Blends of high molecular weight CRE with high molecular weight cyanoethyl cellulose (CRC) provide films with high dielectric constants.

NASA



N94-15960*# National Aeronautics and Space Administration. Pasadena Office, CA.
SELECTIVE FORMATION OF POROUS SILICON Patent Application
JONES FATHAUER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 7 Jun. 1993 16 p
(Contract NAS7-918)
(NASA-CASE-NPO-18735-1-CU; NAS 1.71:NPO-18735-1-CU; US-PATENT-APPL-SN-073019) Avail: CASI HC A03/MF A01

A pattern of porous silicon is produced in the surface of a silicon substrate by forming a pattern of crystal defects in said surface, preferably by applying an ion milling beam through openings in a photoresist layer to the surface, and then exposing said surface to a stain etchant, such as HF:HNO3:H20. The defected crystal will preferentially etch to form a pattern of porous silicon. When the amorphous content of the porous silicon exceeds 70 percent, the porous silicon pattern emits visible light at room temperature.

NASA

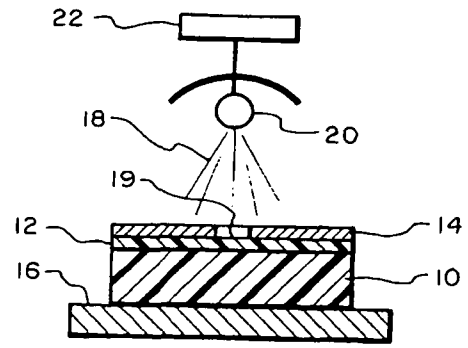


Fig. 1a.

N94-17559*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

***LOW DIELECTRIC POLYIMIDES* Patent Application**

ANNE K. ST.CLAIR, inventor (to NASA), TERRY L. ST.CLAIR, inventor (to NASA), and WILLIAM P. WINFREE, inventor (to NASA) 14 Jun. 1993 17 p

(NASA-CASE-LAR-14987-2; NAS 1.71: LAR-14987-2; US-PATENT-APPL-SN-077166) Avail: CASI HC A03/MF A01

A series of polyimides based on the dianhydride of 1,4-bis (3,4-dicarboxyphenoxy) benzene (HQDEA) or on 2,2-bis(4(3-aminophenoxy phenyl)hexafluoropropane (3-BDAF) are evolved from high molecular weight polyamic acid solutions yielding flexible free-standing films and coatings in the fully imidized form which have a dielectric constant in the range of 2.5 to 3.1 at 10 GHz.

NASA

N94-20195* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

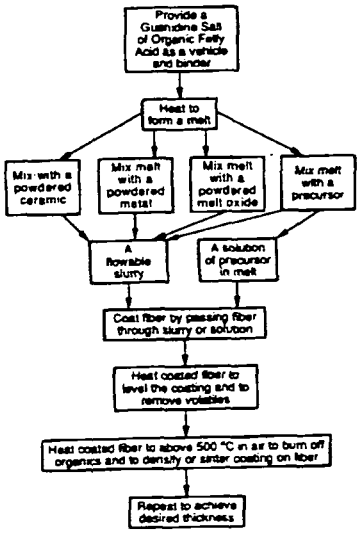
GUANIDINE BASED VEHICLE/BINDERS FOR USE WITH OXIDES, METALS, AND CERAMICS Patent

WARREN H. PHILIPP, inventor (to NASA), LISA C. VEITCH, inventor (to NASA), and MARTHA H. JASKOWIAK, inventor (to NASA) 26 Oct. 1993 7 p Filed 13 Mar. 1992 Supersedes N92-23461 (30 - 14, p 2354)

(NASA-CASE-LEW-15314-1;US-PATENT-5,256,451;US-PATENT-APPL-SN-842313; US- PATENT- CLASS-427-374.2; US-PATENT-CLASS-427-383.1; US-PATENT- CLASS-427-383.3; US-PATENT-CLASS-427-384; US-PATENT- CLASS-427-383.5; INT-PATENT-CLASS-B05D-5/00) Avail: US Patent and Trademark Office

The use of guanidine salts of organic fatty acids (guanidine soaps) as vehicles and binders for coating substrate surfaces is disclosed. Being completely organic, the guanidine soaps can be burned off leaving no undesirable residue. Of special interest is the use of guanidine 2-ethyl hexanoate as the vehicle and binder for coating problematic surfaces such as in coating alumina fibers with platinum or zirconia. For this application, the guanidine soap is used as a melt. For applications, the guanidine soap may be use in a solution with a variety of solvents, the solution containing chlorome talates or powdered metals, refractories, or ceramics.

Official Gazette of the U.S. Patent and Trademark Office



N94-20359* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

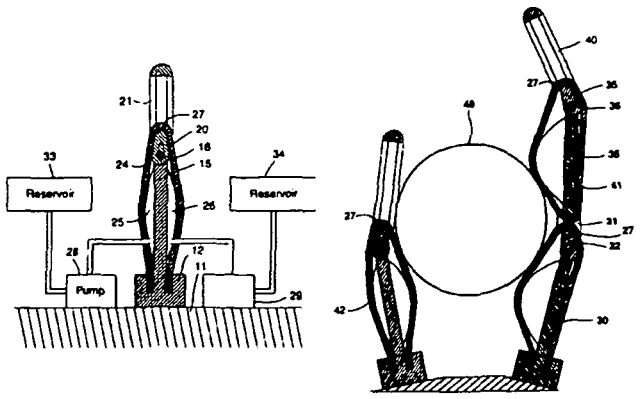
***BLADDER OPERATED ROBOTIC JOINT* Patent**

GLEN A. ROBERTSON, inventor (to NASA) 21 Sep. 1993 6 p Filed 13 Jul. 1992 Supersedes N92-29831 (30 - 20, p 3426)

(NASA-CASE-MFS-28682-1; US-PATENT-5,245,885; US-PATENT-APPL-SN-912401; US-PATENT-CLASS-74-479B; US-PATENT-CLASS-92-48; US-PATENT-CLASS-92-92; US-PATENT-CLASS-294-119.3; US-PATENT-CLASS-623-26; US-PATENT-CLASS-901-22; US-PATENT-CLASS-901-37) Avail: US Patent and Trademark Office

This invention is a robotic joint which is operated by inflatable bladders and which can be used in applications where it is desired to move or hold an object. A support block supports an elongated plate to which is pivotally attached a finger. A tension strip passes over a lever attached to the finger and is attached at its ends to the support block on opposite sides of the plate. Bladders positioned between the plate and the tension strip on opposite sides of the plate can be inflated by pumps to pivot the finger, with one of the bladders being inflated while the other is being deflated.

Official Gazette of the U.S. Patent and Trademark Office



N94-20373* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

A PROCESS FOR PREPARING AN ASSEMBLY OF AN ARTICLE AND A SOLUBLE POLYIMIDE WHICH RESISTS DIMENSIONAL CHANGE, DELAMINATION, AND DEBONDING WHEN EXPOSED TO CHANGES IN TEMPERATURE Patent

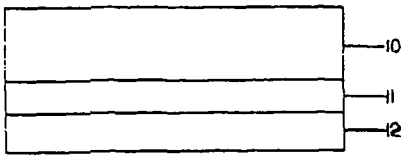
DIANE M. STOAKLEY, inventor (to NASA) and ANNE K. ST.CLAIR, inventor (to NASA) 28 Sep. 1993 6 p Filed 26 Jul. 1991 Supersedes N92-12121 (30 - 3, p 374)

(NASA-CASE-LAR-14763-1; US-PATENT-5,248,519; US-PATENT-APPL-SN-736667; US- PATENT-CLASS-427-96; US-PATENT-CLASS-427-163; US- PATENT-CLASS-427-385.5; US-PATENT-CLASS-427-388.1; INT-PATENT-CLASS-B05D-1/00; INT-PATENT-CLASS-B05D-5/06; INT-PATENT-CLASS-B05D-5/12) Avail: US Patent and Trademark Office

An assembly of an article and a polyimide is prepared. The assembly resists dimensional change, delamination, or debonding when exposed to changes in temperature. An article is provided. A soluble polyimide resin solution having a low coefficient of thermal

expansion (CTE) was prepared by dissolving the polyimide in solvent and adding a metal ion-containing additive to the solution. Examples of the additive are: Ho(OOCCH3), Er(NPPA)3, TmCl3, and Er(C5H7O2)3. The soluble polyimide resin is combined with the article to form the assembly.

Official Gazette of the U.S. Patent and Trademark Office



N94-20374* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

POLYIMIDES CONTAINING AMIDE AND PERFLUOROISOPROPYLIDENE CONNECTING GROUPS Patent

JAMES F. DEZERN, inventor (to NASA) 7 Sep. 1993 5 p Filed 28 Aug. 1991 Supersedes N92-17676 (30 - 8, p 1271)
(NASA-CASE-LAR-14608-1; US-PATENT-5,243,023; US-PATENT-APPL-SN-752246; US-PATENT-CLASS-528-331; US-PATENT-CLASS-528-28; US-PATENT-CLASS-528-41; US-PATENT-CLASS-528-310; US-PATENT-CLASS-528-353; INT-PATENT-CLASS-C08G-69/32; INT-PATENT-CLASS-C08G-73/10) Avail: US Patent and Trademark Office

New, thermooxidatively stable polyimides were prepared from the reaction of aromatic dianhydrides containing isopropylidene bridging groups with aromatic diamines containing amide connecting groups between the rings. Several of these polyimides were shown to be semi-crystalline as evidenced by wide angle x ray scattering and differential scanning calorimetry. Most of the polyimides form tough, flexible films with high tensile properties. These polyimide films exhibit enhanced solubility in organic solvents.

Official Gazette of the U.S. Patent and Trademark Office

N94-20377* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

IMPROVED CERAMIC SLIP CASTING TECHNIQUE Patent

GREGORY M. BUCK, inventor (to NASA) and PETER VASQUEZ, inventor (to NASA) 30 Nov. 1993 3 p Filed 22 Sep. 1992 Supersedes N93-20041 (31 - 7, 1858)
(NASA-CASE-LAR-14471-1; US-PATENT-5,266,252; US-PATENT-APPL-SN-950580; US- PATENT-CLASS-264-86; US-PATENT-CLASS-264-221; INT- PATENT-CLASS-C04B-33/28)
Avail: US Patent and Trademark Office

A primary concern in modern fluid dynamics research is the experimental verification of computational aerothermodynamic codes. This research requires high precision and detail in the test model employed. Ceramic materials are used for these models because of their low heat conductivity and their survivability at high temperatures. To fabricate such models, slip casting techniques were developed to provide net-form, precision casting capability for high-purity ceramic materials in aqueous solutions. In previous slip casting techniques, block, or flask molds made of plaster-of-paris were used to draw liquid from the slip material. Upon setting, parts were removed from the flask mold and cured in a kiln at high temperatures. Casting detail was usually limited with this technique -- detailed parts were frequently damaged upon separation from the flask mold, as the molded parts are extremely delicate in the uncured state, and the flask mold is inflexible. Ceramic surfaces were also marred by 'parting lines' caused by mold separation. This adversely affected the aerodynamic surface quality of the model as well. (Parting lines are invariably necessary on or near the leading edges of wings, nosetips, and fins for mold separation. These areas are also critical for flow boundary layer control.) Parting agents used in the casting process also affected surface quality. These agents eventually soaked into the mold, the model, or flaked off when releasing the case model. Different materials were tried, such as oils, paraffin, and even an algae. The algae released best, but some of it remained on the model and imparted an uneven texture and discoloration on the model surface when cured. According to the present invention, a wax pattern for a shell mold is provided, and an aqueous mixture of a calcium sulfate-bonded investment material is applied as a coating to the wax pattern. The coated wax pattern is then dried, followed by curing to vaporize the wax pattern and leave a shell mold of the calcium sulfate-bonded investment material. The shell mold is cooled to room temperature, and a ceramic slip is poured therein. After a ceramic shell of desired thickness has set up in the shell mold, excess ceramic slip is poured out. While still wet, the shell mold is peeled from the ceramic shell to expose any delicate or detailed parts, after which the ceramic shell is cured to provide a complete, detailed, precision ceramic article without parting lines.

Official Gazette of the U.S. Patent and Trademark Office

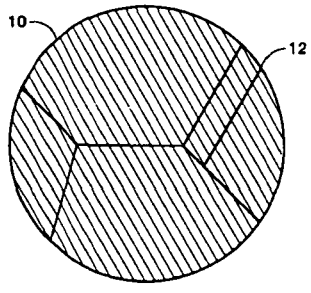
N94-20529* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

SINTERING SILICON NITRIDE Patent

NAROTTAM P. BANSAL, inventor (to NASA), STANLEY R. LEVINE, inventor (to NASA), and WILLIAM A. SANDERS, inventor (to NASA) 26 Oct. 1993 4 p Filed 27 Nov. 1992 Supersedes N93-17062 (31 - 5, p 1126)
(NASA-CASE-LEW-15489-1; US- PATENT- 5,256,610; US-PATENT-APPL-SN-982535; US-PATENT- CLASS-501-97; US-PATENT-CLASS-501-96; INT-PATENT- CLASS-C04B-35/58)
Avail: US Patent and Trademark Office

Oxides having a composition of (Ba(1-x)Sr(x))O-Al2O3-2SiO2 are used as sintering aids for producing an improved silicon nitride ceramic material. The x must be greater than 0 to insure the formation of the stable monoclinic celsian glass phase.

Official Gazette of the U.S. Patent and Trademark Office



N94-20541* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

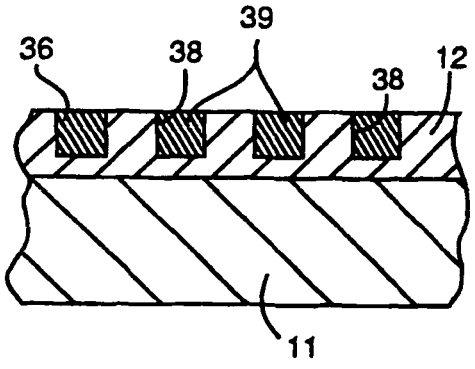
METHOD OF FABRICATING A ROCKET ENGINE COMBUSTION CHAMBER Patent

RICHARD R. HOLMES, inventor (to NASA), TIMOTHY N. MCKECHNIE, inventor (to NASA), CHRISTOPHER A. POWER, inventor (to NASA), RONALD L. DANIEL, JR., inventor (to NASA), and ROBERT M. SAXELBY, inventor (to NASA) 5 Oct. 1993 7 p Filed 27 Jan. 1993 Supersedes N93-30565 (31 - 11, p 3338)
(NASA-CASE-MFS-28569-1; US-PATENT-5,249,357; US-

PATENT-APPL-SN-009908; US-PATENT-CLASS-29-890.01; US-PATENT-CLASS-427-236; US-PATENT-CLASS-427-270; US-PATENT-CLASS-427-455; INT-PATENT-CLASS-B23P-15/00) Avail: US Patent and Trademark Office

A process for making a combustion chamber for a rocket engine wherein a copper alloy in particle form is injected into a stream of heated carrier gas in plasma form which is then projected onto the inner surface of a hollow metal jacket having the configuration of a rocket engine combustion chamber is described. The particles are in the plasma stream for a sufficient length of time to heat the particles to a temperature such that the particles will flatten and adhere to previously deposited particles but will not spatter or vaporize. After a layer is formed, cooling channels are cut in the layer, then the channels are filled with a temporary filler and another layer of particles is deposited.

Official Gazette of the U.S. Patent and Trademark Office



N94-23075* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

DI(HYDROXYPHENYL)- 1,2,4-TRIAZOLE MONOMERS Patent

JOHN W. CONNELL, inventor (to NASA), PAUL M. HERGENROTHER, inventor (to NASA), and PETER WOLF, inventor (to NASA) 14 Sep. 1993 8 p Filed 29 Jun. 1992 Division of US-Patent-Appl-SN-650336, filed 24 Jan. 1991

(NASA-CASE-LAR-14440-2; US-PATENT-5,245,043; US-PATENT-APPL-SN-905708; US-PATENT-APPL-SN-650336; US-PATENT-CLASS-548-269.4; US-PATENT-CLASS-548-267.4; US-PATENT-CLASS-548-267.8; US-PATENT-CLASS-548-268.6; INT-PATENT-CLASS-C07D-249/08) Avail: US Patent and Trademark Office

The di(hydroxyphenyl)- 1,2,4-triazole monomers were first synthesized by reacting bis (4-hydroxyphenyl) hydrazide with aniline hydrochloride at 250 C in the melt and also by reacting 1,3 or 1,4-bis-(4-hydroxyphenyl)- phenylene- dihydrazide with 2 moles of aniline hydrochloride in the melt. Purification of the di(hydroxyphenyl)-1,2,4-triazole monomers was accomplished by recrystallization. Poly (1,2,4-triazoles) (PT) were prepared by the aromatic nucleophilic displacement reaction of di(hydroxyphenyl)- 1,2,4-triazole monomers with activated aromatic dihalides or activated aromatic dinitro compounds. The reactions were carried out in polar aprotic solvents such as sulfolane or diphenylsulfone using alkali metal bases such as potassium carbonate at elevated temperatures under nitrogen. This synthetic route has provided high molecular weight PT of new chemical structure, is economically and synthetically more favorable than other routes, and allows for facile chemical structure variation due to the availability of a large variety of activated aromatic dihalides.

Official Gazette of the U.S. Patent and Trademark Office

N94-23076* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

PREPARING POLYMERIC MATRIX COMPOSITES USING AN AQUEOUS SLURRY TECHNIQUE Patent

NORMAN J. JOHNSTON, inventor (to NASA) and TIMOTHY W. TOWELL, inventor (to NASA) 12 Oct. 1993 6 p Filed 6 Nov. 1991

(NASA-CASE-LAR-14771-1; US-PATENT-5,252,168; US-PATENT-APPL-SN-788403; US-PATENT-CLASS-156-307.4; US-PATENT-CLASS-156-330.9; US-PATENT-CLASS-428-367; US-PATENT-CLASS-428-408; US-PATENT-CLASS-524-538; US-PATENT-CLASS-524-608; INT-PATENT-CLASS-C09J-5/02) Avail: US Patent and Trademark Office

An aqueous process was developed to prepare a consolidated composite laminate from an aqueous slurry. An aqueous poly(amic acid) surfactant solution was prepared by dissolving a poly(amic acid) powder in an aqueous ammonia solution. A polymeric powder was added to this solution to form a slurry. The slurry was deposited on carbon fiber to form a prepreg which was dried and stacked to form a composite laminate. The composite laminate was consolidated using pressure and was heated to form the polymeric matrix. The resulting composite laminate exhibited high fracture toughness and excellent consolidation.

Official Gazette of the U.S. Patent and Trademark Office

N94-23079* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

POLYIMIDE PROCESSING ADDITIVES Patent

J. RICHARD PRATT, inventor (to NASA), TERRY L. ST.CLAIR, inventor (to NASA), DIANE M. STOAKLEY, inventor (to NASA), and HAROLD D. BURKS, inventor (to NASA) 21 Dec. 1993 24 p Filed 22 May 1992 Continuation of US-Patent-Appl-SN-084064, filed 11 Aug. 1987

(NASA-CASE-LAR-13669-2; US-PATENT-5,272,248; US-PATENT-APPL-SN-892058; US-PATENT-APPL-SN-084064; US-PATENT-CLASS-528-353; US-PATENT-CLASS-528-170; US-PATENT-CLASS-528-171; US-PATENT-CLASS-528-173; US-PATENT-CLASS-528-174; US-PATENT-CLASS-528-176) Avail: US Patent and Trademark Office

A process for preparing polyimides having enhanced melt flow properties is described. The process consists of heating a mixture of a high molecular weight poly-(amic acid) or polyimide with a low molecular weight amic acid or imide additive in the range of 0.05 to 15 percent by weight of the additive. The polyimide powders so obtained show improved processability, as evidenced by lower melt viscosity by capillary rheometry. Likewise, films prepared from mixtures of polymers with additives show improved processability with earlier onset of stretching by TMA.

Official Gazette of the U.S. Patent and Trademark Office

N94-23305* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

DI(HYDROXYPHENYL)- BENZIMIDAZOLE MONOMERS Patent

JOHN W. CONNELL, inventor (to NASA), PAUL M. HERGENROTHER, inventor (to NASA), and JOSEPH G. SMITH, inventor (to NASA) 14 Sep. 1993 10 p Filed 8 Sep. 1992 Division of US-Patent-Appl-SN-790730, filed 30 Oct. 1991

(NASA-CASE-LAR-14643-2; US-PATENT-5,245,044; US-PATENT-APPL-SN-941816; US-PATENT-APPL-SN-790730; US-PATENT-CLASS-548-305.7; US-PATENT-CLASS-548-305.4; US-PATENT-CLASS-548-145; INT-PATENT-CLASS-C07D-235/18) Avail: US Patent and Trademark Office

Di(hydroxyphenyl)benzimidazole monomers were prepared from phenyl-hydroxybenzoate and aromatic bis(o-diamine)s. These monomers were used in the synthesis of soluble polybenzimidazoles. The reaction involved the aromatic nucleophilic displacement of

various di(hydroxyphenyl)benzimidazole monomers with activated aromatic dihalides or activated aromatic dinitro compounds in the presence of an alkali metal base. These polymers exhibited lower glass transition temperatures, improved solubility, and better compression moldability over their commercial counterparts.

Official Gazette of the U.S. Patent and Trademark Office

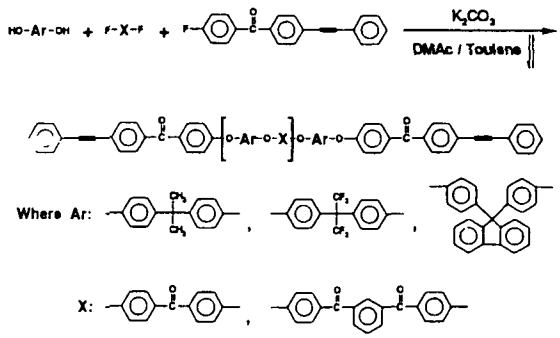
N94-23307* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

PHENYLETHYNL-TERMINATED POLY(ARYLENE ETHERS) Patent

BRIAN J. JENSEN, inventor (to NASA), ROBERT G. BRYANT, inventor (to NASA), and PAUL M. HERGENROTHER, inventor (to NASA) 7 Dec. 1993 9 p Filed 2 Apr. 1993 (NASA-CASE-LAR-14797-1;US-PATENT-5,268,444;US-PATENT-APPL-SN-045336;US-PATENT-CLASS-528-125; US-PATENT-CLASS-528-126;US-PATENT-CLASS-528-151; US-PATENT-CLASS-528-152;US-PATENT-CLASS-528-153; US-PATENT-CLASS-528-155; US-PATENT-CLASS-528-219) Avail: US Patent and Trademark Office

Phenylethynyl-terminated poly(arylene ethers) are prepared in a wide range of molecular weights by adjusting monomer ratio and adding an appropriate amount of 4-fluoro- 4'-phenylethynyl benzophenone during polymer synthesis. The resulting phenylethynyl-terminated poly(arylene ethers) react and crosslink upon curing for one hour at 350 C to provide materials with improved solvent resistance, higher modulus, and better high temperature properties than the linear, uncrosslinked polymers.

Official Gazette of the U.S. Patent and Trademark Office



General Synthesis of Phenylethynyl-terminated Oligomers

N94-23311* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

CERAMIC SILICON-BORON-CARBON FIBERS FROM ORGANIC SILICON-BORON-POLYMERS Patent

SALVATORE R. RICCITIELLO, inventor (to NASA), MING-TA S. HSU, inventor (to NASA), and TIMOTHY S. CHEN, inventor (to NASA) 29 Jun. 1993 12 p Filed 11 May 1992 Continuation-in-part of US-Patent-Appl-SN-643629, filed 18 Jan. 1991 which is a division of US-Patent-Appl-SN-361471,filed 5 Jun. 1989 (NASA-CASE-ARC-11956-1-SB;US-PATENT-5,223,461; US-PATENT-APPL-SN-880856;US-PATENT-APPL-SN-643629; US-PATENT-APPL-SN-361471;US-PATENT-CLASS-501-95; US-PATENT-CLASS-501-90;US-PATENT-CLASS-501-92; US-PATENT-CLASS-264-DIG.19; INT-PATENT-CLASS-C04B-35/52) Avail: US Patent and Trademark Office

Novel high strength ceramic fibers derived from boron, silicon, and carbon organic precursor polymers are discussed. The ceramic fibers are thermally stable up to and beyond 1200 C in air. The method of preparation of the boron-silicon-carbon fibers from a low oxygen content organosilicon boron precursor polymer of the general formula Si(R2)BR(sup 1) includes melt-spinning, crosslinking, and pyrolysis. Specifically, the crosslinked (or cured) precursor organic polymer fibers do not melt or deform during pyrolysis to form the silicon-boron-carbon ceramic fiber. These novel silicon-boron-carbon ceramic fibers are useful in high temperature applications because they retain tensile and other properties up to 1200 C, from 1200 to 1300 C, and in some cases higher than 1300 C.

Official Gazette of the U.S. Patent and Trademark Office

31

ENGINEERING (GENERAL)

Includes vacuum technology; control engineering; display engineering; cryogenics; and fire prevention.

N94-15881*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

NONAQUEOUS SLIP CASTING OF HIGH TEMPERATURE CERAMIC SUPERCONDUCTORS USING AN INVESTMENT CASTING TECHNIQUE Patent Application

MATTHEW W. HOOKER, inventor (to NASA) (Clemson Univ., SC.), THEODORE D. TAYLOR, inventor (to NASA) (Clemson Univ., SC.), STEPHANIE A. WISE, inventor (to NASA), JOHN D. BUCKLEY, inventor (to NASA), PETER VASQUEZ, inventor (to NASA), GREGORY M. BUCK, inventor (to NASA), and LANA P. HICKS, inventor (to NASA) 16 Aug. 1993 9 p (NASA-CASE-LAR-14918-1; NAS 1.71:LAR-14918-1; US-PATENT-APPL-SN-096498) Avail: CASI HC A02/MF A01

A process for slip casting ceramic articles that does not employ parting agents and affords the casting of complete, detailed, precision articles that do not possess parting lines is presented. This process is especially useful for high temperature superconductors and water-sensitive ceramics. A wax pattern for a shell mold is provided, and an aqueous mixture of a calcium sulfate-bonded investment material is applied as a coating to the wax pattern. The coated wax pattern is then dried, followed by curing to vaporize the wax pattern and leave a shell mold of the calcium sulfate-bonded investment material. The shell mold is cooled to room temperature, and a ceramic slip, created by dispersing a ceramic powder in an organic liquid, is poured therein. After a ceramic shell of desired thickness or a solid article has set up in the shell mold, excess ceramic slip is poured out. The shell mold is misted with water and peeled away from the ceramic article, after which the ceramic is fired to provide a complete, detailed, precision, high temperature superconductive ceramic article without parting lines. The casting technique may take place in the presence of a magnetic field to orient the ceramic powders during the casting process.

NASA

32

COMMUNICATIONS AND RADAR

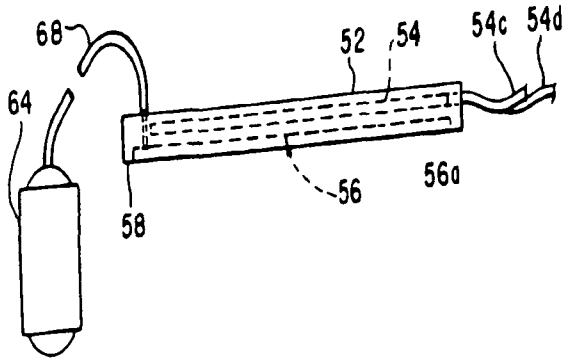
Includes radar; land and global communications; communications theory; and optical communications.

N94-20368* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

FLEXIBLE HEATING HEAD FOR INDUCTION HEATING Patent
ROBERT L. FOX, inventor (to NASA), SAMUEL D. JOHNSON, inventor (to NASA), ROBERT H. COULTRIP, inventor (to NASA), and W. MORRIS PHILLIPS, inventor (to NASA) 30 Nov. 1993 8p Filed 31 Oct. 1991 Supersedes N92-31257 (30 - 22, p 3803) (NASA-CASE-LAR-14418-15-B; US-PATENT-5,266,764; US-PATENT-APPL-SN-790723; US-PATENT-CLASS-219-10.75; US-PATENT-CLASS-219-9.5; US-PATENT-CLASS-219-10.77; US-PATENT-CLASS-219-10.79; US-PATENT-CLASS-156-272.2; US-PATENT-CLASS-156-272.4; INT-PATENT-CLASS-H05B-6/36) Avail: US Patent and Trademark Office

An induction heating head includes a length of wire having first and second opposite ends and being wound in a flat spiral shape to form an induction coil, a capacitor connected to the first and second ends of the wire, the induction coil and capacitor defining a tank circuit, and a flexible, elastomeric body molded to encase the induction coil. When a susceptor is placed in juxtaposition to the body, and the tank circuit is powered, the susceptor is inductively heated.

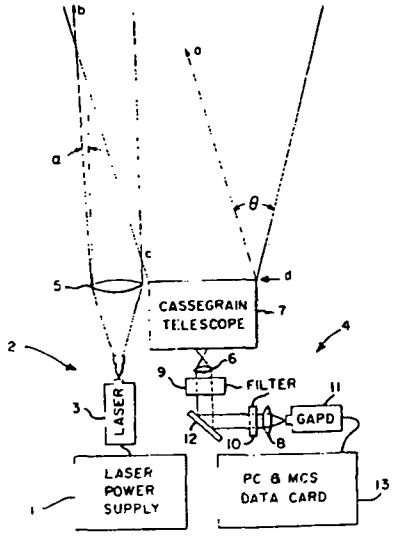
Official Gazette of the U.S. Patent and Trademark Office



N94-23827* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
MICRO PULSE LASER RADAR Patent
JAMES D. SPINHIRNE, inventor (to NASA) 31 Aug. 1993 12 p Filed 13 Aug. 1992 Supersedes N94-17322 (32 - 3, p 1004) (NASA-CASE-GSC-13493-1; US-PATENT-5,241,315; US-PATENT-APPL-SN-929216; US-PATENT-CLASS-342-54; US-PATENT-CLASS-342-26; US-PATENT-CLASS-356-5; US-PATENT-CLASS-356-28.5; US-PATENT-CLASS-356-342; INT-PATENT-CLASS-G01C-3/08; INT-PATENT-CLASS-G01S-13/95) Avail: US Patent and Trademark Office

An eye safe, compact, solid state lidar for profiling atmospheric cloud and aerosol scattering is disclosed. The transmitter of the micro pulse lidar is a diode pumped micro-J pulse energy, high repetition rate Nd:YLF laser. Eye safety is obtained through beam expansion. The receiver employs a photon counting solid state Geiger mode avalanche photodiode detector. Data acquisition is by a single card multichannel scaler. Daytime background induced quantum noise is controlled by a narrow receiver field-of-view and a narrow bandwidth temperature controlled interference filter. Dynamic range of the signal is limited to optical geometric signal compression. Signal simulations and initial atmospheric measurements indicate that micropulse lider systems are capable of detecting and profiling all significant cloud and aerosol scattering through the troposphere and into the stratosphere. The intended applications are scientific studies and environmental monitoring which require full time, unattended measurements of the cloud and aerosol height structure.

Official Gazette of the U.S. Patent and Trademark Office



33
ELECTRONICS AND ELECTRICAL ENGINEERING

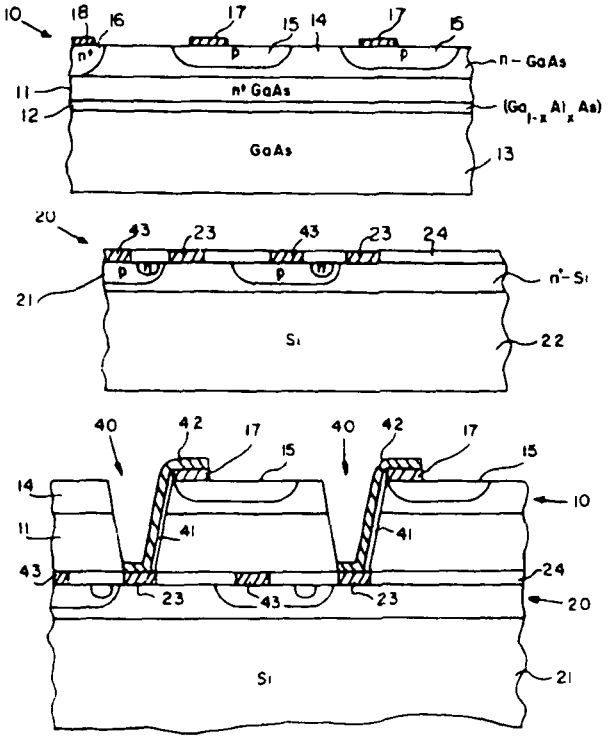
Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

N94-10656* National Aeronautics and Space Administration. Pasadena Office, CA.
METHOD FOR PRODUCING A HYBRIDIZATION OF DETECTOR ARRAY AND INTEGRATED CIRCUIT FOR READOUT Patent
ERIC R. FOSSUM, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and FRANK J. GRUNTHANER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 17 Aug. 1993 7 p Filed 29 Apr. 1992 Supersedes N92-305542 (30 - 21, p 3623)
(NASA-CASE-NPO-18062-1-CU; US-PATENT-5,236,871; US-PATENT-APPL-SN-877966; US- PATENT-CLASS-437-195; US-PATENT-CLASS-437-3; US- PATENT-CLASS-437-5; US-PATENT-CLASS-437-203; US- PATENT-CLASS-437-234; US-PATENT-CLASS-148-DIG.80; INT-PATENT-CLASS-H01L-21/44) Avail: US Patent and Trademark Office

A process is explained for fabricating a detector array in a layer of semiconductor material on one substrate and an integrated readout circuit in a layer of semiconductor material on a separate substrate in order to select semiconductor material for optimum performance of each structure, such as GaAs for the detector array and Si for the integrated readout circuit. The detector array layer is lifted off its substrate, laminated on the metallized surface on the integrated surface, etched with reticulating channels to the surface of the integrated circuit, and provided with interconnections between the detector array pixels and the integrated readout circuit through the channels. The adhesive material for the lamination is

selected to be chemically stable to provide electrical and thermal insulation and to provide stress release between the two structures fabricated in semiconductor materials that may have different coefficients of thermal expansion.

Official Gazette of the U.S. Patent and Trademark Office



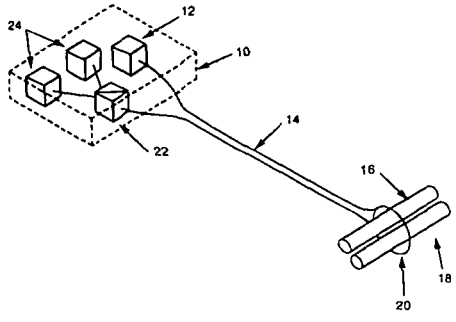
N94-15706*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

A METHOD OF DETECTING AND LOCATING ELECTRICAL CURRENT IMBALANCES Patent Application

RICHARD L. PATTERSON, inventor (to NASA) 21 Jan. 1993 16p (NASA-CASE-LEW-15407-1; NAS 1.71:LEW-15407-1; US-PATENT-APPL-SN-006413) Avail: CASI HC A03/MF A01

A method of detecting and locating current imbalances such as ground faults in multiwire systems using the Faraday effect is described. As an example, for 2-wire or 3-wire (1 ground wire) electrical systems, light is transmitted along an optical path which is exposed to magnetic fields produced by currents flowing in the hot and neutral wires. The rotations produced by these two magnetic fields cancel each other, therefore light on the optical path does not read the effect of either. However, when a ground fault occurs, the optical path is exposed to a net Faraday effect rotation due to the current imbalance thereby exposing the ground fault.

NASA



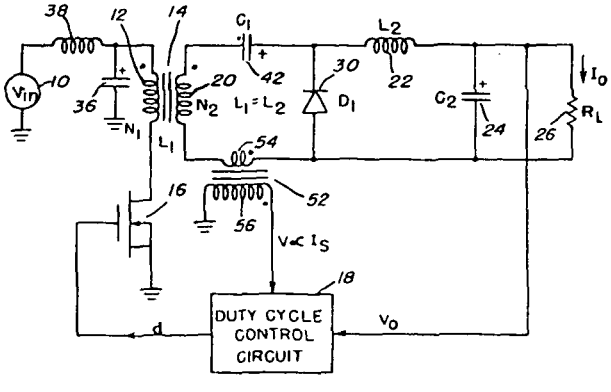
N94-15874*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

FORBACK DC-TO-DC CONVERTER Patent Application

ALAN T. LUKEMIRE, inventor (to NASA) 24 Mar. 1993 33 p (NASA-CASE-GSC-13404-1; NAS 1.71:GSC-13404-1; US-PATENT-APPL-SN-038746) Avail: CASI HC A03/MF A01

A pulse-width modulated DC-to-DC power converter including a first inductor, i.e. a transformer or an equivalent fixed inductor equal to the inductance of the secondary winding of the transformer, coupled across a source of DC input voltage via a transistor switch which is rendered alternately conductive (ON) and nonconductive (OFF) in accordance with a signal from a feedback control circuit is described. A first capacitor capacitively couples one side of the first inductor to a second inductor which is connected to a second capacitor which is coupled to the other side of the first inductor. A circuit load shunts the second capacitor. A semiconductor diode is additionally coupled from a common circuit connection between the first capacitor and the second inductor to the other side of the first inductor. A current sense transformer generating a current feedback signal for the switch control circuit is directly coupled in series with the other side of the first inductor so that the first capacitor, the second inductor and the current sense transformer are connected in series through the first inductor. The inductance values of the first and second inductors, moreover, are made identical. Such a converter topology results in a simultaneous voltsecond balance in the first inductance and ampere-second balance in the current sense transformer.

NASA



N94-15952*# *National Aeronautics and Space Administration.* Pasadena Office, CA.
CELLULOSE TRIACETATE, THIN FILM DIELECTRIC CAPACITOR Patent Application
SHIAO-PING S. YEN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and T. RICHARD JOW, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 28 May 1993 13 p
(Contract NAS7-918)
(NASA-CASE-NPO-18935-1-CU;NAS1.71:NPO-18935-1-CU; US-PATENT-APPL-SN-071416) Avail: CASI HC A03/MF A01

Very thin films of cellulose triacetate are cast from a solution containing a small amount of high boiling temperature, non-solvent which evaporates last and lifts the film from the casting surface. Stretched, oriented, crystallized films have high electrical breakdown properties. Metallized films less than about 2 microns in thickness form *self-healing electrodes* for high energy density, pulsed power capacitors. Thicker films can be utilized as a dielectric for a capacitor.

NASA

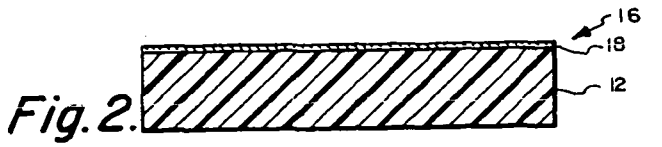
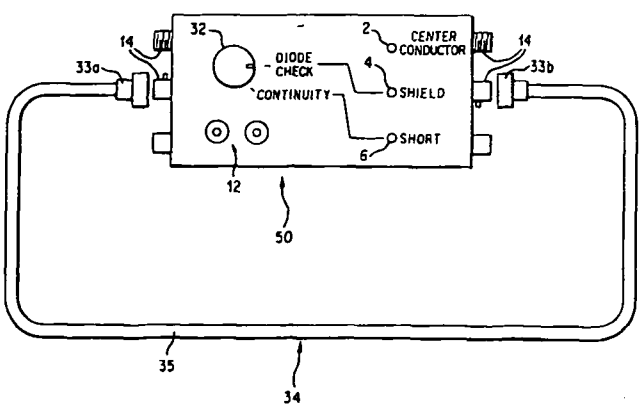


Fig. 2.

N94-15988*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
A DEVICE FOR TESTING CABLES Patent Application
ARTHUR RAY HAYHURST, inventor (to NASA) 7 Jun. 1993 12 p
(NASA-CASE-LAR-14093-1; NAS 1.71:LAR-14093-1; US-PATENT-APPL-SN-073845) Avail: CASI HC A03/MF A01

A device for testing current paths is attachable to a conductor. The device automatically checks the current paths of the conductor for continuity of a center conductor, continuity of a shield, and a short circuit between the shield and the center conductor. The device includes a pair of connectors and a circuit to provide for testing of the conductive paths of a cable to be tested with the circuit paths of the circuit. The circuit paths in the circuit include indicators to simultaneously indicate the results of the testing.

NASA



N94-17323*# *National Aeronautics and Space Administration.* Pasadena Office, CA.
LEAK DETECTION UTILIZING ANALOG BINAURAL (VLSI) TECHNIQUES Patent Application
FRANK T. HARTLEY, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 18 Aug. 1993 23 p
(Contract NAS7-918)
(NASA-CASE-NPO-18399-1-CU; NAS 1.71: NPO- 18399-1-CU; US-PATENT-APPL-SN-111317) Avail: CASI HC A03/MF A01

A detection method and system utilizing silicon models of the traveling wave structure of the human cochlea to spatially and temporally locate a specific sound source in the presence of high noise pandemonium is presented. The detection system combines two-dimensional stereausis representations, which are output by at least three VLSI binaural hearing chips, to generate a three-dimensional stereausis representation including both binaural and spectral information which is then used to locate the sound source.

NASA

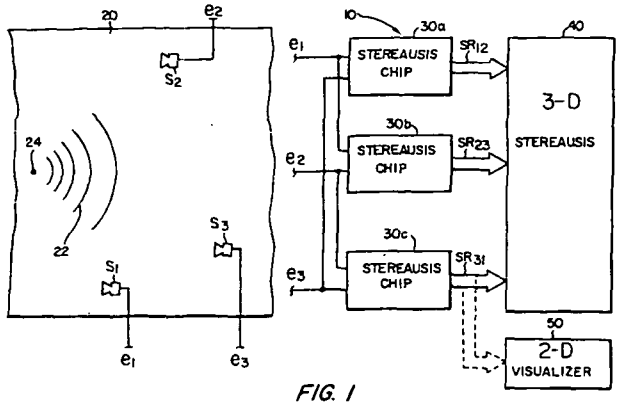


FIG. 1

N94-17324*# National Aeronautics and Space Administration. Pasadena Office, CA.
OPTICALLY-SWITCHED SUBMILLIMETER-WAVE OSCILLATOR AND RADIATOR Patent Application
MICHAEL G. SPENCER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and JOSEPH MASERJIAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 23 Sep. 1993 29 p
(Contract NAS7-918)
(NASA-CASE-NPO-18547-1-CU; NAS 1.71:NPO-18547-1-CU; US-PATENT-APPL-SN-125966) Avail: CASI HC A03/MF A01

A submillimeter wave-generating integrated circuit includes an array of N photoconductive switches biased across a common voltage source and an optical path difference from a common optical pulse of repetition rate f sub 0 providing a different optical delay to each of the switches. In one embodiment, each incoming pulse is applied to successive ones of the N switches with successive delays. The N switches are spaced apart with a suitable switch-to-switch spacing so as to generate at the output load or antenna radiation of a submillimeter wave frequency f on the order

of Nf sub 0. Preferably, the optical pulse has a repetition rate of at least 10 GHz and N is of the order of 100, so that the circuit generates radiation of frequency of the order of or greater than 1 Terahertz.

NASA

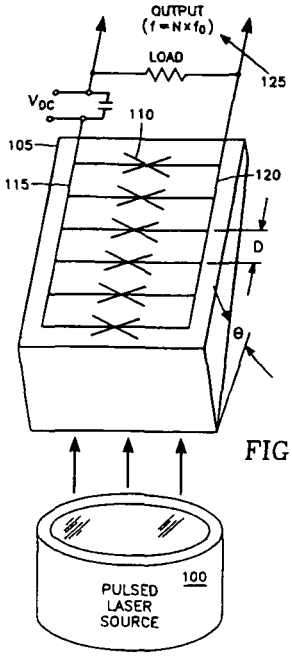


FIG. 1

N94-17325*# National Aeronautics and Space Administration. Pasadena Office, CA.

THIN COMPOSITE SOLID ELECTROLYTE FILM FOR LITHIUM BATTERIES Patent Application

EMMANUEL PELED, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), GANESAN NAGASUBRAM ANIAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), GERALD HALPERT, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), and ALAN I. ATTIA, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 20 Aug. 1993 18 p (Contract NAS7-918)

(NASA-CASE-NPO-18694-1-CU; NAS 1.71: NPO- 18694-1-CU; US-PATENT-APPL-SN-112483) Avail: CASI HC A03/MF A01

A composite solid electrolyte film for a lithium battery comprising a dispersion of small reinforcing particles such as alumina in a binder rein such as polyethylene oxide is presented. The particles are coated with a compatible lithium salt such as lithium iodide and the alumina particles preferably have a size below 0.5 microns.

NASA

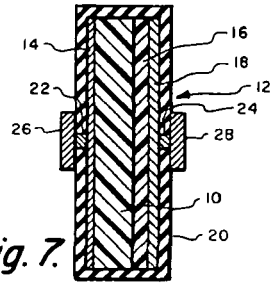


Fig. 7.

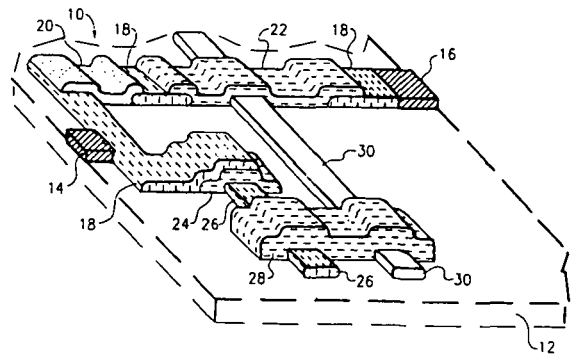
N94-23820* National Aeronautics and Space Administration. Pasadena Office, CA.

NON-VOLATILE, SOLID STATE BISTABLE ELECTRICAL SWITCH Patent

ROGER M. WILLIAMS, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 11 Jan. 1994 9 p Filed 28 Jan. 1991 Supersedes N90-17010 (28 - 9, p 1209) Continuation of abandoned US-Patent-Appl-SN-414820, filed 29 Sep. 1989 (NASA-CASE-NPO-17621-1-CU; US-PATENT-5,278,636; US-PATENT-APPL-SN-654439; US-PATENT-APPL-SN-414820; US-PATENT-CLASS-257-2; US-PATENT-CLASS-307-201; US-PATENT-CLASS-338-13; US-PATENT-CLASS-338-38; US-PATENT-CLASS-361-500; US-PATENT-CLASS-257-528) Avail: US Patent and Trademark Office

A bistable switching element is made of a material whose electrical resistance reversibly decreases in response to intercalation by positive ions. Flow of positive ions between the bistable switching element and a positive ion source is controlled by means of an electrical potential applied across a thermal switching element. The material of the thermal switching element generates heat in response to electrical current flow therethrough, which in turn causes the material to undergo a thermal phase transition from a high electrical resistance state to a low electrical resistance state as the temperature increases above a predetermined value. Application of the electrical potential in one direction renders the thermal switching element conductive to pass electron current out of the ion source. This causes positive ions to flow from the source into the bistable switching element and intercalate the same to produce a non-volatile, low resistance logic state. Application of the electrical potential in the opposite direction causes reverse current flow which de-intercalates the bistable logic switching element and produces a high resistance logic state.

Official Gazette of the U.S. Patent and Trademark Office



N94-23821*# National Aeronautics and Space Administration. Pasadena Office, CA.

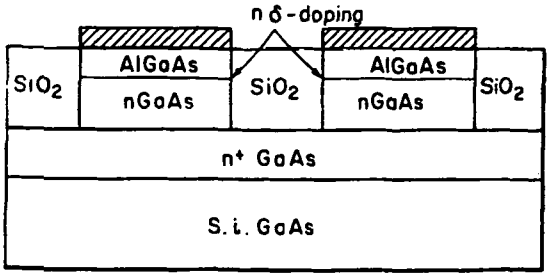
PLANAR VARACTOR FREQUENCY MULTIPLIER DEVICES WITH BLOCKING BARRIER Patent

UDO LIENEWEG, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), MARGARET A. FRERKING, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), and JOSEPH MASERJIAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 11 Jan. 1994 13p Filed 26 Feb. 1992 Supersedes N92-23464 (30- 14, p 2369) (NASA-CASE-NPO-18428-1-CU; US-PATENT-5,278,444; US-PATENT-APPL-SN-842297; US-PATENT-CLASS-257-476;

US-PATENT-CLASS-257-15; US-PATENT-CLASS-257-199; US-PATENT-CLASS-257-480; US-PATENT-CLASS-257-482; US-PATENT-CLASS-257-486; US-PATENT-CLASS-257-506) Avail: US Patent and Trademark Office

The invention relates to planar varactor frequency multiplier devices with a heterojunction blocking barrier for near millimeter wave radiation of moderate power from a fundamental input wave. The space charge limitation of the submillimeter frequency multiplier devices of the BIN(sup +) type is overcome by a diode structure comprising an n(sup +) doped layer of semiconductor material functioning as a low resistance back contact, a layer of semiconductor material with n-type doping functioning as a drift region grown on the back contact layer, a delta doping sheet forming a positive charge at the interface of the drift region layer with a barrier layer, and a surface metal contact. The layers thus formed on an n(sup +) doped layer may be divided into two isolated back-to-back BNN(sup +) diodes by separately depositing two surface metal contacts. By repeating the sequence of the drift region layer and the barrier layer with the delta doping sheet at the interfaces between the drift and barrier layers, a plurality of stacked diodes is formed. The novelty of the invention resides in providing n-type semiconductor material for the drift region in a GaAs/AlGaAs structure, and in stacking a plurality of such BNN(sup +) diodes stacked for greater output power with and connected back-to-back with the n(sup +) GaAs layer as an internal back contact and separate metal contact over an AlGaAs barrier layer on top of each stack.

Official Gazette of the U.S. Patent and Trademark Office



N94-23823* National Aeronautics and Space Administration. Pasadena Office, CA.

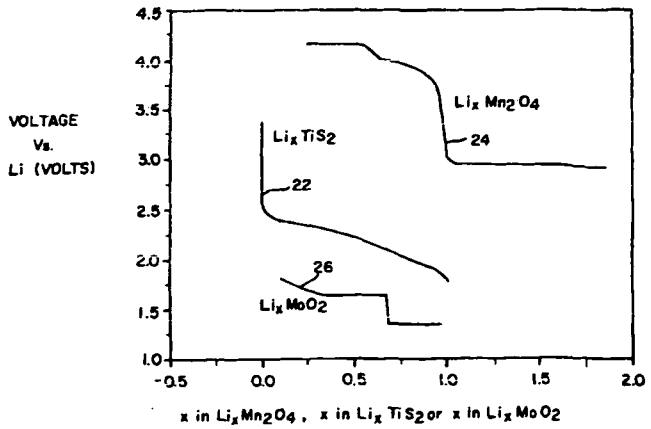
OVERCHARGE AND OVERDISCHARGE PROTECTION OF AMBIENT TEMPERATURE SECONDARY LITHIUM CELLS Patent

CHEN-KUO HUANG, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), SUBBARAO SURAMPUDI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), ALAN I. ATTIA, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), and GERALD HALPERT, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 11 Jan. 1994 8 p Filed 2 Sep. 1992 Supersedes N93-11456 (31 - 2, p 290)

(NASA-CASE-NPO-18343-1-CU; US-PATENT-5,278,000; US-PATENT-APPL-SN-942491; US- PATENT-CLASS-429-91; US-PATENT-CLASS-426-191; US- PATENT-CLASS-429-194; US-PATENT-CLASS-429-218; INT-PATENT-CLASS-H01M-10/48) Avail: US Patent and Trademark Office

A cathode additive is provided for protecting an ambient temperature secondary lithium cell from overcharging or overdischarging. The cathode additive is chosen to create an upper voltage plateau which is slightly higher than a characteristic charge cutoff voltage of the cathode of the cell. The cathode additive additionally creates a lower voltage plateau which is slightly lower than the characteristic discharge cutoff voltage of the cell. Preferably, the cathode additive is a transition metal oxide or a sulfide and may, for example, include a mixture of Li2Mn2O4 and Li(0.1)MoO2.

Official Gazette of the U.S. Patent and Trademark Office



34
FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

N94-15962*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

GEOMETRICAL VAPOR BLOCKER FOR PARALLEL CONDENSATION TUBES REQUIRING COOLING Patent Application

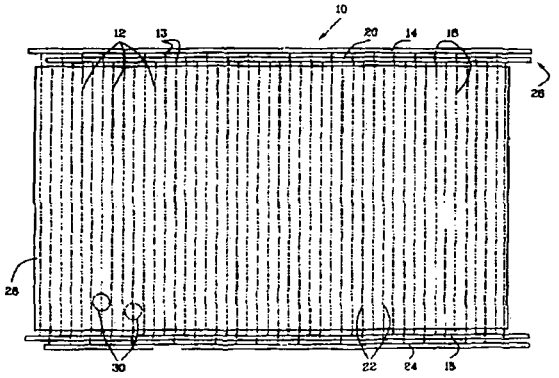
EUGENE UNGAR, inventor (to NASA), JOHN CORNWELL, inventor (to NASA), and WILLIAM HARWELL, inventor (to NASA) 3 Sep. 1993 20 p

(NASA-CASE-MSC-22090-1; NAS 1.71:MSC-22090-1; US-PATENT-APPL-SN-115832) Avail: CASI HC A03/MF A01

An apparatus and method is disclosed for regulating flow of working fluid through parallel condensation tubes requiring subcooling. The apparatus provides an elongated restriction element extending into the outlet of the respective condensation tubes to the approximate point of onset of subcooling. The elongated restriction element is braced externally to the condensation tube with a support that is used for positioning and maintaining the elongated restriction element in the correct position. The elongated restriction element has a pentagonal cross-section and is slightly

undersized with respect to the working fluid passageways through the condensation tubes. The restriction member significantly restricts flow of partially vaporized working fluid but does not significantly affect the flow of fully liquid working fluid.

NASA



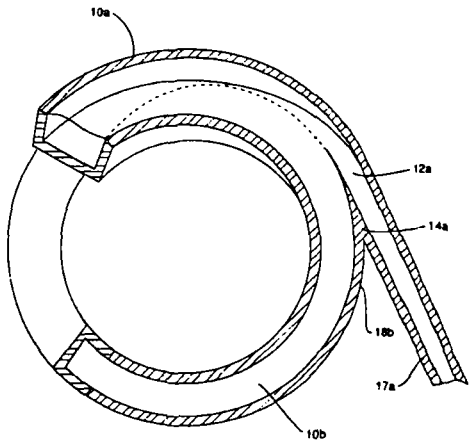
N94-20361* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

SPIRAL FLUID SEPARATOR Patent

GLEN A. ROBERTSON, inventor (to NASA) 28 Sep. 1993 5 p Filed 9 Oct. 1992 *Supersedes N93-17039 (31 - 5, p 1163)* (NASA-CASE-MFS-28658-1; US-PATENT-5,248,421; US-PATENT-APPL-SN-958843; US-PATENT-CLASS-210-512.1; US-PATENT-CLASS-210-787; US-PATENT-CLASS-209-144; US-PATENT-CLASS-209-211; US-PATENT-CLASS-55-459.1; INT-PATENT-CLASS-B01D-21/26) Avail: US Patent and Trademark Office

A fluid separator for separating particulate matter such as contaminates is provided which includes a series of spiral tubes of progressively decreasing cross sectional area connected in series. Each tube has an outlet on the outer curvature of the spiral. As fluid spirals down a tube, centrifugal force acts to force the heavier particulate matter to the outer wall of the tube, where it exits through the outlet. The remaining, and now cleaner, fluid reaches the next tube, which is smaller in cross sectional area, where the process is repeated. The fluid which comes out the final tube is diminished of particulate matter.

Official Gazette of the U.S. Patent and Trademark Office



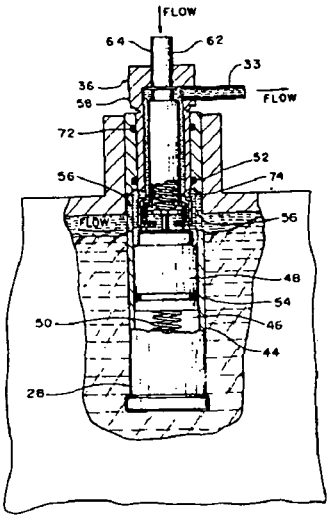
N94-20371* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

COOLING APPARATUS AND COUPLINGS THEREFOR Patent

CURTIS LOMAX, inventor (to NASA) and BRUCE WEBBON, inventor (to NASA) 16 Nov. 1993 10 p Filed 21 May 1991 Supersedes N92-11286 (30 - 2, p 232)
(NASA-CASE-ARC-11921-1; US- PATENT-5,261,482; US-PATENT-APPL-SN-703649; US- PATENT-CLASS-165-10; US-PATENT-CLASS-165-104.17; US-PATENT-CLASS-165-78; US-PATENT-CLASS-62-59; US-PATENT-CLASS-62-259.3; US-PATENT-CLASS-62-299; INT-PATENT-CLASS-F28D-20/00) Avail: US Patent and Trademark Office

The present invention relates generally to the field of thermal transfer and, more specifically, to a direct-interface, fusible heat sink for non-venting, regenerable, and self-contained thermal regulation. A quick connect coupling includes a male and a female portion. The female portion is frozen in a container of solid-phase coolant fluid, i.e., water, so that passages in the housing are blocked by ice initially. The ice is melted by direct interface with liquid coolant fluid delivered from the male portion. The present invention has advantages in that the phase change material remains sealed at all times, including during regeneration. Also, it uses quick-disconnect couplings that allow the phase change material to completely fill the container and is easily handled in microgravity without spills, leakage, or handling of phase change material.

Official Gazette of the U.S. Patent and Trademark Office



N94-20495* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

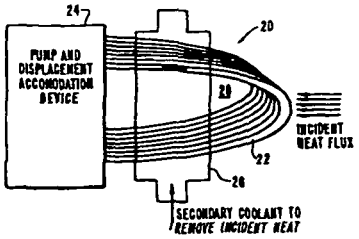
HEAT EXCHANGER WITH OSCILLATING FLOW Patent

STEPHEN J. SCOTTI, inventor (to NASA), MAX L. BLOSSER, inventor (to NASA), and CHARLES J. CAMARDA, inventor (to NASA) 24 Aug. 1993 12 p Filed 24 Feb. 1992 Supersedes N92-30024 (30 - 20, p 3447) Division of US-Patent-Appl-SN-501909, filed 30 Mar. 1990 (NASA-CASE-LAR-14033-2; US- PATENT-5,238,056; US-PATENT-APPL-SN-843653; US-PATENT-APPL-SN-501909; US-PATENT-CLASS-165-109.1; US-PATENT-CLASS-165-97; US-PATENT-CLASS-165-104.31; US-PATENT-CLASS-165-110; US-PATENT-CLASS-165-903; US-PATENT-CLASS-165-913) Avail: US Patent and Trademark Office

Various heat exchange apparatuses are described in which an oscillating flow of primary coolant is used to dissipate an incident heat flux. The oscillating flow may be imparted by a reciprocating piston, a double action twin reciprocating piston, fluidic oscillators or electromagnetic pumps. The oscillating fluid flows through at least

one conduit in either an open loop or a closed loop. A secondary flow of coolant may be used to flow over the outer walls of at least one conduit to remove heat transferred from the primary coolant to the walls of the conduit.

Official Gazette of the U.S. Patent and Trademark Office



N94-20588* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

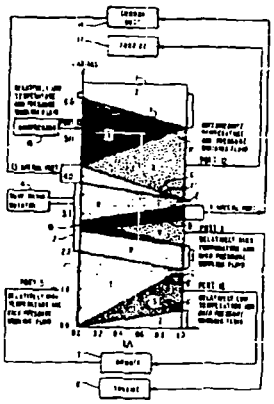
SYSTEM AND METHOD FOR CANCELLING EXPANSION WAVES IN A WAVE ROTOR Patent

DANIEL E. PAXSON, inventor (to NASA) 7 Dec. 1993 9 p Filed 26 May 1992 Supersedes N93-11172 (31 - 2, p 297)

(NASA-CASE-LEW-15218-1; US-PATENT-5,267,432; US-PATENT-APPL-SN-889003; US-PATENT-CLASS-60-39.45; US-PATENT-CLASS-417-64; INT-PATENT-CLASS-F02C-3/02) Avail: US Patent and Trademark Office

A wave rotor system that is comprised of a wave rotor coupled to first and second plates is described. Special ports are provided, one in each of the first and second end plates, to cancel expansion waves generated by the release of working fluid from the wave rotor. One of the expansion waves is reflected in the wave rotor from a reflecting portion and provided to the special port in the second end plate. Fluid present at the special port in the second end plate has a stagnation pressure and mass flow which is the same as that of the cells of the wave rotor communicating with such special port. This allows for cancellation of the expansion wave generated by the release of working fluid from the wave rotor. The special port in the second end plate has a first end corresponding to the head of the expansion wave and a second end corresponding to the tail of the expansion wave. Also, the special port is configured to continually change along the circumference of the second end plate to affect expansion wave cancellation. An expansion wave generated by a second release of working fluid from the wave rotor is cancelled in a similar manner to that described above using a special port in the first end plate. The cycle of operation of the wave rotor system is designed so that the stagnation pressure and mass flow of the fluid present at the special ports is the same so that the special ports may be connected by a common duct.

Official Gazette of the U.S. Patent and Trademark Office



N94-23077* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

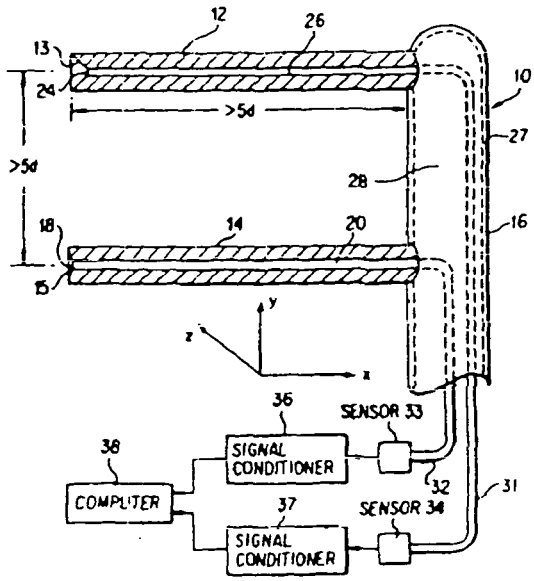
PROBE SHAPES THAT MEASURE TIME-AVERAGED STREAMWISE MOMENTUM AND CROSS-STREAM TURBULENCE INTENSITY Patent

VERNON J. ROSSOW, inventor (to NASA) 7 Sep. 1993 21 p Filed 21 Feb. 1991

(NASA-CASE-ARC-11934-1; US-PATENT-5,241,866; US-PATENT-APPL-SN-660473; US-PATENT-CLASS-73-861.66; US-PATENT-CLASS-73-170.14; US-PATENT-CLASS-73-147; US-PATENT-CLASS-73-180; INT-PATENT-CLASS-G01F-1/46) Avail: US Patent and Trademark Office

A method and apparatus for directly measuring the time-averaged streamwise momentum in a turbulent stream use a probe which has total head response which varies as the cosine-squared of the angle of incidence. The probe has a nose with a slight indentation on its front face for providing the desired response. The method of making the probe incorporates unique design features. Another probe may be positioned in a side-by-side relationship to the first probe to provide a direct measurement of the total pressure. The difference between the two pressures yields the sum of the squares of the cross-stream components of the turbulence level.

Official Gazette of the U.S. Patent and Trademark Office



N94-23306* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

PROBE SYSTEMS FOR MEASURING STATIC PRESSURE AND TURBULENCE INTENSITY IN FLUID STREAMS Patent

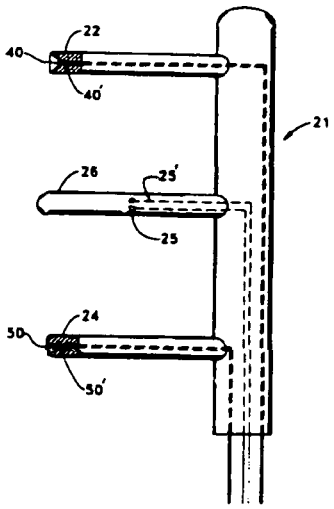
VERNON J. ROSSOW, inventor (to NASA) 10 Aug. 1993 19 p Filed 24 Apr. 1991

(NASA-CASE-ARC-11935-1; US-PATENT-5,233,865; US-PATENT-APPL-SN-690440; US-PATENT-CLASS-73-147; US-PATENT-CLASS-73-861.65; INT-PATENT-CLASS-G01F-1/46; INT-PATENT-CLASS-G01P-5/165) Avail: US Patent and Trademark Office

A method and an apparatus for measuring time-averaged static or ambient pressure and turbulence intensity in a turbulent stream are discussed. The procedure involves placing a plurality of probes in the stream. Each probe responds in a different manner to charac-

teristics of the fluid stream, preferably as a result of having varying cross sections. The responses from the probes are used to eliminate unwanted components in the measured quantities for accurate determination of selected characteristics.

Official Gazette of the U.S. Patent and Trademark Office



35

INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

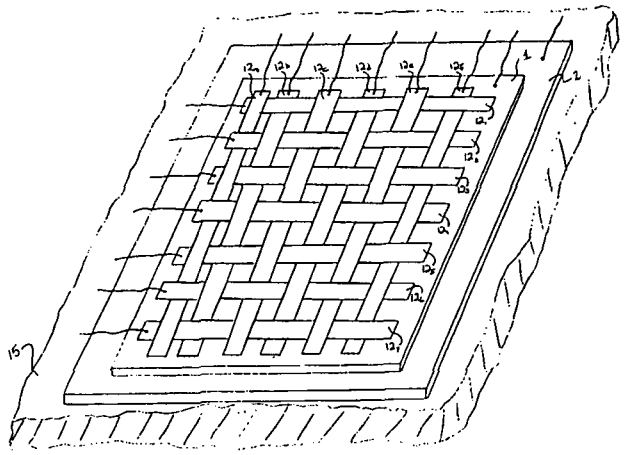
N94-15872*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

CAPACIFLECTOR CAMERA Patent Application

JOHN M. VRANISH, inventor (to NASA) 12 Jul. 1993 39 p (NASA-CASE-GSC-13564-1; NAS 1.71:GSC-13564-1; US-PATENT-APPL-SN-090230) Avail: CASI HC A03/MF A01

A capacitive type proximity sensor having improved range and sensitivity between a surface and an intruding object in the vicinity of the surface having a voltage source, a number of outer electrical conductors on the surface with each forming one electrode of a number of sensor capacitors, the other electrode for each sensor capacitor being the object is described. The outer conductors are made from thin sheets of conductive material covered with insulation. An intermediate electrical conductor is located between the outer conductors and the surface and is of a size larger than the outer conductors to act as a shield for reducing the parasitic capacitance between the outer conductors and the surface. The intermediate conductor is also made from a thin sheet of conductive material covered with insulation. The outer conductors and the intermediate conductor are attached to the surface with no gap between the insulation on the conductors and no gap between the surface and the insulation on intermediate conductor, the outer conductors and the intermediate conductor conjoining with each other and with the surface, with the surface acting as a ground plane. A current-measuring voltage follower circuit is connected to the voltage source for coupling in phase and amplitude the instantaneous voltage at the voltage source to the outer electrical conductors and the intermediate electrical conductor. This circuit is responsive to the change in capacitance of the sensor capacitors and generates a number of output signals.

NASA



N94-15875*# National Aeronautics and Space Administration. Pasadena Office, CA.

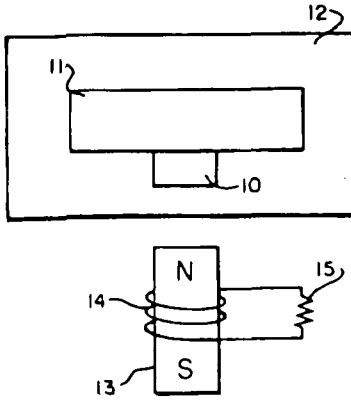
SUPERCONDUCTIVE MATERIAL AND MAGNETIC FIELD FOR DAMPING AND LEVITATION SUPPORT AND DAMPING OF CRYOGENIC INSTRUMENTS Patent Application

BENJAMIN P. DOLGIN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 15 Jun. 1993 14 p (Contract NAS7-918)

(NASA-CASE-NPO-18458-1-CU;NAS 1.71:NPO-18458-1-CU; US-PATENT-APPL-SN-077470) Avail: CASI HC A03/MF A01

A superconductive load bearing support without a mechanical contact and vibration damping for cryogenic instruments in space is presented. The levitation support and vibration damping is accomplished by the use of superconducting magnets and the 'Meissner' effect. The assembly allows for transfer of vibration energy away from the cryogenic instrument which then can be damped by the use of either an electronic circuit or conventional vibration damping mean.

NASA



N94-15877*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
IMPROVEMENTS TO PULSED PHASE LOCKED LOOP STRAIN MONITOR Patent Application
MARK E. FROGGATT, inventor (to NASA) 12 Aug. 1993 58 p (NASA-CASE-LAR-14887-1; NAS 1.71:LAR-14887-1; US-PATENT-APPL-SN-105161) Avail: CASI HC A04/MF A01

A pulse phase locked loop system according to the present invention is described. A frequency generator such as a voltage controlled oscillator (VCO) generates an output signal and a reference signal having a frequency equal to that of the output signal. A transmitting gate gates the output frequency signal and this gated signal drives a transmitting transducer which transmits an acoustic wave through a material. A sample/hold samples a signal indicative of the transmitted wave which is received by a receiving transducer. Divide-by-n counters control these gating and sampling functions in response to the reference signal of the frequency generator. Specifically, the output signal is gated at a rate of F/h, wherein F is the frequency of the output signal and h is an integer; and the received signal is sampled at a delay of F/n wherein n is an integer.

NASA

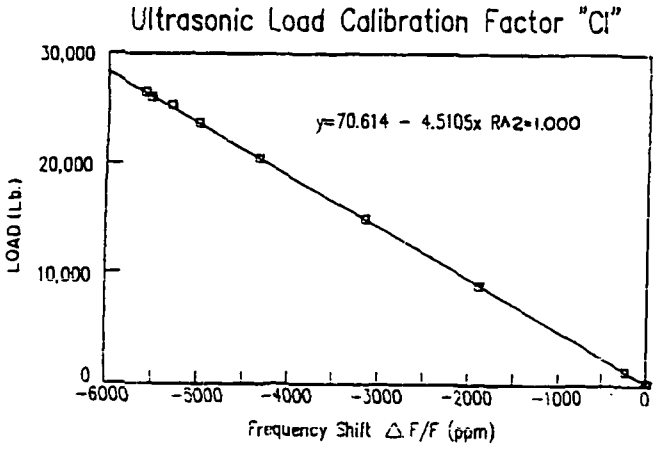
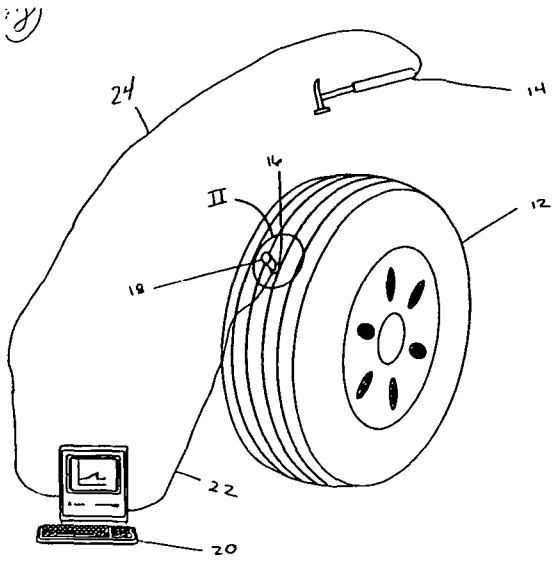


FIG. 2

N94-15884*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
REMOTE TIRE PRESSURE SENSING TECHNIQUE Patent Application
HOWARD H. ROBINSON, inventor (to NASA), TIMOTHY A. MCGINNIS, inventor (to NASA) (Wyle Labs., Inc., Hampton, VA.), and ROBERT H. DAUGHERTY, inventor (to NASA) 23 Aug. 1993 9 p
(NASA-CASE-LAR-14160-1; NAS 1.71:LAR-14160-1; US-PATENT-APPL-SN-111321) Avail: CASI HC A02/MF A01

A remote tire pressure sensing technique is provided which uses vibration frequency to determine tire pressure. A vibration frequency measuring device is attached to the external surface of a tire which is then struck with an object, causing the tire to vibrate. The frequency measuring device measures the vibrations and converts the vibrations into corresponding electrical impulses. The electrical impulses are then fed into the frequency analyzing system which uses the electrical impulses to determine the relative peaks of the vibration frequencies as detected by the frequency measuring device. The measured vibration frequency peaks are then compared to predetermined data describing the location of vibration frequency peaks for a given pressure, thereby determining the air pressure of the tire.

NASA



N94-15928*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
DUAL ACTIVE SURFACE, MINIATURE, PLUG-TYPE HEAT FLUX GAUGE Patent Application
CURT H. LIEBERT, inventor (to NASA) and JOHN KOCH, JR., inventor (to NASA) 16 Apr. 1993 15 p
(NASA-CASE-LEW-15643-1; NAS 1.71:LEW-15643-1; US-PATENT-APPL-SN-047120) Avail: CASI HC A03/MF A01

A plug-type heat flux gauge can simultaneously measure heat flux on two opposite surfaces of thick or very thin convection or impingement cooled metal walls. The gauge is capable of continuously measuring transient and steady heat flux under transient and steady state gauge temperature operating conditions. The length of the gauge extends through the entire thickness of the material. A non-linear temperature gradient through the gauge can be measured by attaching 3-5 thermocouples along the length of the gauge.

NASA

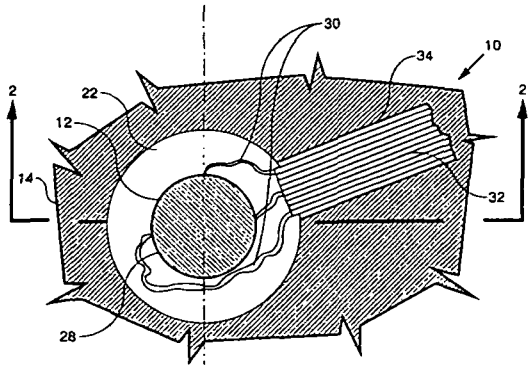


FIG. 1

N94-15987*# National Aeronautics and Space Administration. Pasadena Office, CA.

ABERRATION CORRECTION OF UNSTABLE RESONATORS Patent Application

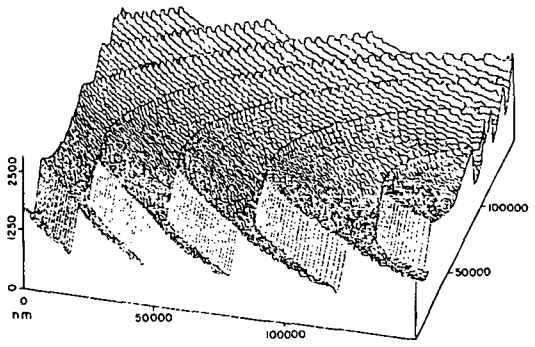
PAUL D. MAKER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and RICHARD E. MULLER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 27 May 1993 35 p

(Contract NAS7-918)

(NASA-CASE-NPO-18791-1-CU; NAS 1.71:NPO-18791-1-CU; US-PATENT-APPL-SN-071131) Avail: CASI HC A03/MF A01

A method for producing a phase hologram using e-beam lithography provides n-ary levels of phase and amplitude by first producing an amplitude hologram on a transparent substrate by e-beam exposure of a resist over a film of metal by exposing n is less than or equal to m x m spots of an array of spots for each pixel, where the spots are randomly selected in proportion to the amplitude assigned to each pixel, and then after developing and etching the metal film producing a phase hologram by e-beam lithography using a low contrast resist, such as PMMA, and n-ary levels of low doses less than approximately 200 micro-C/sq cm and preferably in the range of 20-200 micro-C/sq cm and aggressive development using pure acetone for an empirically determined time (about 6 sec.) controlled to within 1/10 sec. to produce partial development of each pixel in proportion to the n-ary level of dose assigned to it.

NASA



N94-23826* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

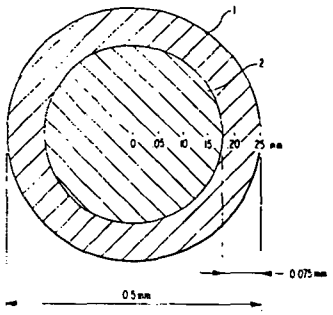
HIGH TEMPERATURE, OXIDATION RESISTANT NOBLE METAL-AL ALLOY THERMOCOUPLE Patent

JAMES L. SMIALEK, inventor (to NASA) and MICHAEL G. GEDWILL, inventor (to NASA) 4 Jan. 1994 7 p Filed 6 Jul. 1993 Supersedes N93-31298 (31 - 12, p 3729)

(NASA-CASE-LEW-15515-1; US- PATENT-5,275,670; US-PATENT-APPL-SN-086584; US- PATENT-CLASS-136-236.1; US-PATENT-CLASS-136-241; INT-PATENT-CLASS-H01L-35/12) Avail: US Patent and Trademark Office

A thermocouple is disclosed. The thermocouple is comprised of an electropositive leg formed of a noble metal-Al alloy and an electronegative leg electrically joined to form a thermocouple junction. The thermocouple provides for accurate and reproducible measurement of high temperatures (600 - 1300 C) in inert, oxidizing or reducing environments, gases, or vacuum. Furthermore, the thermocouple circumvents the need for expensive, strategic precious metals such as rhodium as a constituent component. Selective oxidation of rhodium is also thereby precluded.

Official Gazette of the U.S. Patent and Trademark Office



36
LASERS AND MASERS

Includes parametric amplifiers.

N94-15932*# National Aeronautics and Space Administration. Pasadena Office, CA.

LASER WITH OPTICALLY DRIVEN Q-SWITCH Patent Application

HAMID HEMMATI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 15 Jul. 1993 12 p

(Contract NAS7-918)

(NASA-CASE-NPO-18470-1-CU; NAS 1.71:NPO-18470-1-CU; US-PATENT-APPL-SN-094332) Avail: CASI HC A03/MF A01

An optically driven interactive Q-switch, i.e., a Q-switch that responds to a short pulse of light, for example, from external light-emitting diodes (LEDs) or diode lasers, is provided for producing an output laser pulse from electronic energy stored in a laser medium. Q-switching is thus achieved on demand by electrically pulsing the light source to produce a pulse of light directed onto a Q-switch medium in the laser cavity. Electronic control of the light pulse from the external source will thus provide not only efficient Q-switching frequency but also independent control of output laser pulse.

NASA

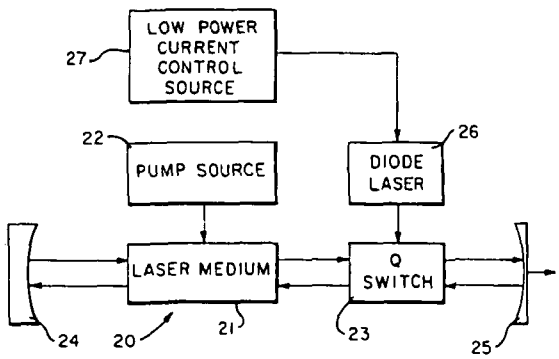


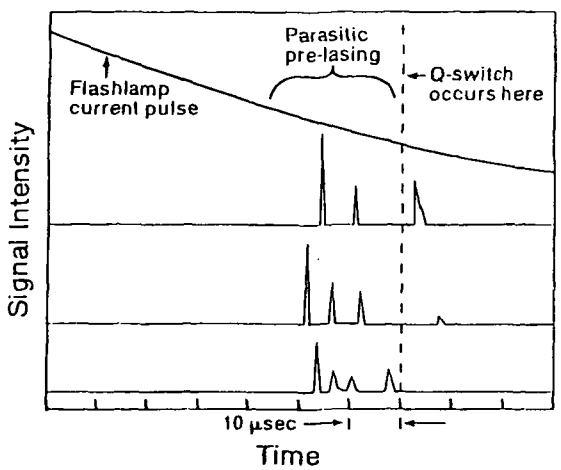
FIG. 2

36 LASERS AND MASERS

N94-15942*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
REDUCTION OF PARASITIC LASING Patent Application
MARK E. STORM, inventor (to NASA) (STX Corp., Hampton, VA.) 11 Aug. 1993 24 p
(NASA-CASE-LAR-14645-1-SB; NAS 1.71:LAR-14645-1-SB; US-PATENT-APPL-SN-105528) Avail: CASI HC A03/MF A01

A technique was developed which carefully retro-reflects precisely controlled amounts of light back into a laser system thereby intentionally forcing the laser system components to oscillate in a new resonator called the parasitic oscillator. The parasitic oscillator uses the laser system to provide the gain and an external mirror is used to provide the output coupling of the new resonator. Any change of gain or loss inside the new resonator will directly change the lasing threshold of the parasitic oscillator. This change in threshold can be experimentally measured as a change in the absolute value of reflectivity, provided by the external mirror, necessary to achieve lasing in the parasitic oscillator. Discrepancies between experimental data and a parasitic oscillator model are direct evidence of optical misalignment or component performance problems. Any changes in the optical system can instantly be measured as a change in threshold for the parasitic oscillator. This technique also enables aligning the system for maximum parasitic suppression with the system fully operational.

NASA



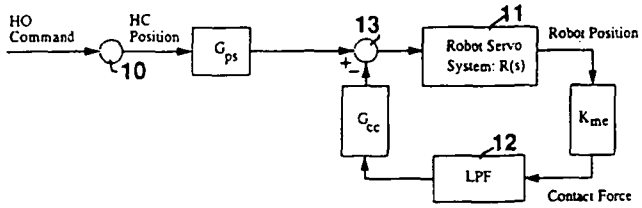
37
MECHANICAL ENGINEERING

Includes auxiliary systems (nonpower); machine elements and processes; and mechanical equipment.

N94-10654* National Aeronautics and Space Administration. Pasadena Office, CA.
FORCE REFLECTION WITH COMPLIANCE CONTROL Patent
WON S. KIM, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 24 Aug. 1993 18 p Filed 8 Jul. 1991 Supersedes N92-29765 (30 - 20, p 3479)
(NASA-CASE-NPO-18668-1-CU;US-PATENT-5,239,246; US-PATENT-APPL-SN-912955; US-PATENT-CLASS-318-568.11; US-PATENT-CLASS-318-560;US-PATENT-CLASS-318-568.21; US-PATENT-CLASS-318-568.17;US-PATENT-CLASS-318-568.12; US-PATENT-CLASS-901-9; US-PATENT-CLASS-901-19) Avail: US Patent and Trademark Office

Two types of systems for force-reflecting control, which enables high force-reflection gain, are presented: position-error-based force reflection and low-pass-filtered force reflection. Both of the systems are combined with shared compliance control. In the position-error-based class, the position error between the commanded and the actual position of a compliantly controlled robot is used to provide force reflection. In the low-pass-filtered force reflection class, the low-pass-filtered output of the compliance control is used to provide force reflection. The increase in force reflection gain can be more than 10-fold as compared to a conventional high-bandwidth pure force reflection system, when high compliance values are used for the compliance control.

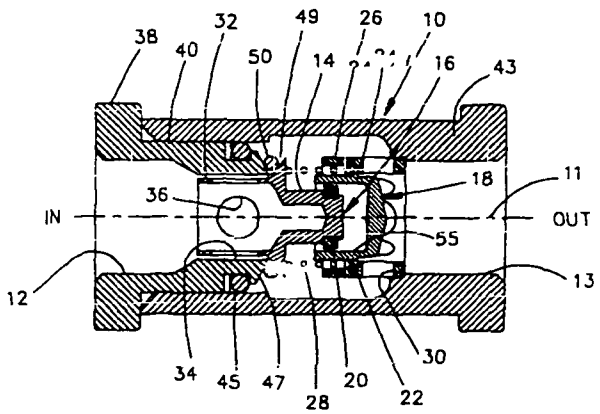
Official Gazette of the U.S. Patent and Trademark Office



N94-10655* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
CHECK VALVE WITH POPPET DAMPING MECHANISM Patent
BRIAN G. MORRIS, inventor (to NASA) 3 Aug. 1993 5 p Filed 22 Jun. 1992 Supersedes N92-30101 (30 - 20, p 3480)
(NASA-CASE-MSC-21903-1; US-PATENT-5,232,013; US-PATENT-APPL-SN-902266; US-PATENT-CLASS-137-514.7; INT-PATENT-CLASS-F16K-15/06) Avail: US Patent and Trademark Office

An inline check valve for a flow line is presented where the valve element is guided for inline travel forward and rearward of a valve sealing member and is spring biased to a closed sealing condition. One of the guides for the valve element includes a dashpot bore and plunger member to control the rate of travel of the valve element in either direction as well as provided a guiding function. The dashpot is not anchored to the valve body so that the valve can be functional even if the plunger member becomes jammed in the dashpot.

Official Gazette of the U.S. Patent and Trademark Office



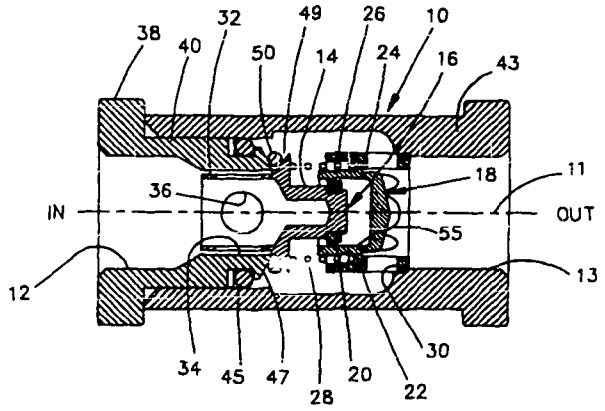
N94-10658* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

CHECK VALVE WITH POPPET DASHPOT/FRICTIONAL DAMPING MECHANISM Patent

BRIAN G. MORRIS, inventor (to NASA) 31 Aug. 1993 5 p Filed 22 Jun. 1992 Supersedes N92-34242 (30 - 24, p 4189) (NASA-CASE-MSC-21950-1; US-PATENT-5,240,036; US-PATENT-APPL-SN-902265; US-PATENT-CLASS-137-514.7; US-PATENT-CLASS-137-514; INT-PATENT-CLASS-F16K-15/06) Avail: US Patent and Trademark Office

An inline check valve for a flow line where the valve element is guided for inline travel forward and rearward of a valve sealing member and is spring biased to a closed sealing condition is presented. One of the guides for the valve element includes a dashpot housing with a bore and plunger member to control the rate of travel of the valve element in either direction, providing a guiding function. The plunger member is arranged with a dashpot ring to frictionally contact the dashpot bore and has an interior tortuous flow path from one side to the other side of the dashpot ring. The dashpot housing is not anchored to the valve body so that the valve can be functional even if the dashpot ring becomes jammed in the dashpot housing.

Official Gazette of the U.S. Patent and Trademark Office



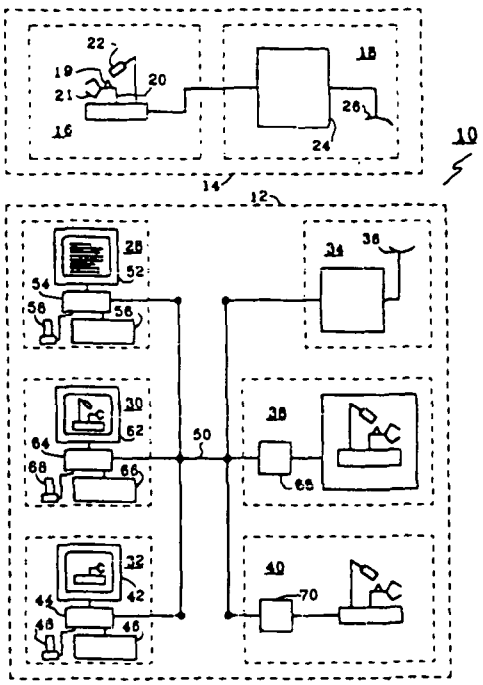
N94-10670* National Aeronautics and Space Administration. Pasadena Office, CA.

TELEROBOT CONTROL SYSTEM Patent

PAUL G. BACKES, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and KAM S. TSO, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 27 Jul. 1993 8 p Filed 9 May 1991 Supersedes N91-32509 (29 - 24, p 4028) (NASA-CASE-NPO-18116-1-CU; US-PATENT-5,231,693; US-PATENT-APPL-SN-699299; US-PATENT-CLASS-395-99; US-PATENT-CLASS-395-84; US-PATENT-CLASS-395-905; US-PATENT-CLASS-318-568.1; INT-PATENT-CLASS-G06F-15/00; INT-PATENT-CLASS-G06F-15/46; INT-PATENT-CLASS-G05B-19/24) Avail: US Patent and Trademark Office

This invention relates to an operator interface for controlling a telerobot to perform tasks in a poorly modeled environment and/or within unplanned scenarios. The telerobot control system includes a remote robot manipulator linked to an operator interface. The operator interface includes a setup terminal, simulation terminal, and execution terminal for the control of the graphics simulator and local robot actuator as well as the remote robot actuator. These terminals may be combined in a single terminal. Complex tasks are developed from sequential combinations of parameterized task primitives and recorded teleoperations, and are tested by execution on a graphics simulator and/or local robot actuator, together with adjustable time delays. The novel features of this invention include the shared and supervisory control of the remote robot manipulator via operator interface by pretested complex tasks sequences based on sequences of parameterized task primitives combined with further teleoperation and run-time binding of parameters based on task context.

Official Gazette of the U.S. Patent and Trademark Office



N94-10674* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

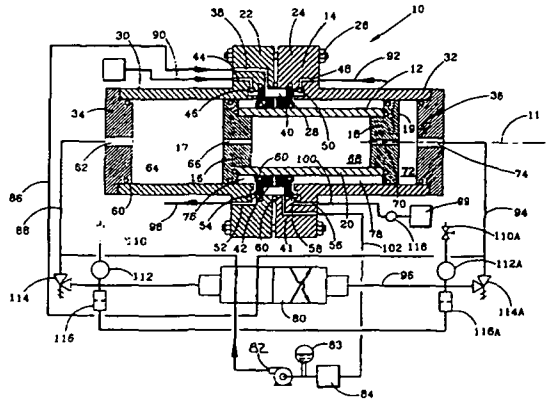
COOLED SPOOL PISTON COMPRESSOR Patent

BRIAN G. MORRIS, inventor (to NASA) 24 Aug. 1993 11 p Filed 29 Dec. 1992 Supersedes N93-19331 (31 - 6, p 1550) (NASA-CASE-MSC-22020-1; US-PATENT-5,238,372; US-PATENT-APPL-SN-998062; US-PATENT-CLASS-417-393; US-PATENT-CLASS-417-404; INT-PATENT-CLASS-F04B-35/00) Avail: US Patent and Trademark Office

A hydraulically powered gas compressor receives low pressure gas and outputs a high pressure gas. The housing of the compressor defines a cylinder with a center chamber having a cross-sectional area less than the cross-sectional area of a left end chamber and a right end chamber, and a spool-type piston assembly is movable within the cylinder and includes a left end closure, a right end closure, and a center body that are in sealing engagement with the respective cylinder walls as the piston reciprocates. First and second annual compression chambers are provided between the piston enclosures and center housing portion of the compressor, thereby minimizing the spacing between the core gas and a cooled surface of the compressor. Restricted flow passageways are provided in the

piston closure members and a path is provided in the central body of the piston assembly, such that hydraulic fluid flows through the piston assembly to cool the piston assembly during its operation. The compressor of the present invention may be easily adapted for a particular application, and is capable of generating high gas pressures while maintaining both the compressed gas and the compressor components within acceptable temperature limits.

Official Gazette of the U.S. Patent and Trademark Office



N94-15707*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

CONNECTOR SYSTEMS FOR STRUCTURES Patent Application

CHRISTIAN LUPO, inventor (to NASA), ERIK EVENSON, inventor (to NASA), and CLARENCE WESSELSKI, inventor (to NASA) (Lockheed Engineering and Sciences Co., Houston, TX.) 25 May 1993 19 p

(NASA-CASE-MSC-21998-1; NAS 1.71:MSC-21998-1; US-PATENT-APPL-SN-066271) Avail: CASI HC A03/MF A01

A releasable coupling device for connecting two members to one another where a collet type fastener has normally retracted latching fingers insertable into a latching recess and a longitudinally movable expander for activating the fastener is described. The longitudinal movement is retained with a paraffin actuated system which can reset. The longitudinal movement of the expander in one direction is through a one way threaded ratchet system which provides an automatic locking action and the expander is movable in either direction by an independently operated threaded action.

NASA

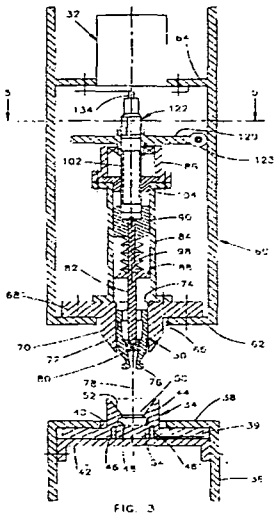


FIG. 3

N94-15882*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

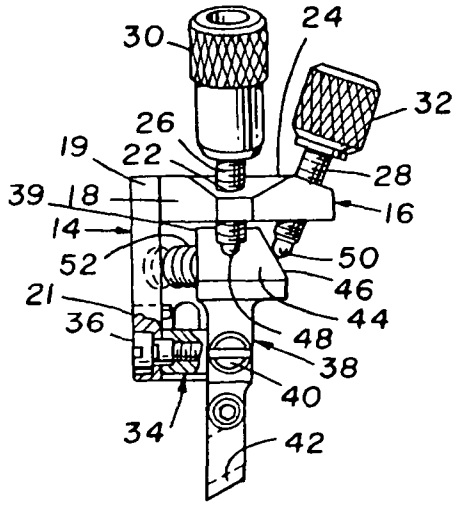
WELDING NOZZLE POSITION MANIPULATOR Patent Application

JEFFREY L. GILBERT, inventor (to NASA) (Rockwell International Corp., Canoga Park, CA.) and DAVID A. GUTOW, inventor (to NASA) (Rockwell International Corp., Canoga Park, CA.) 31 Aug. 1993 16 p

(NASA-CASE-MFS-29837-1; NAS 1.71:MFS-29837-1; US-PATENT-APPL-SN-114043) Avail: CASI HC A03/MF A01

The present invention is directed to a welding nozzle position manipulator. The manipulator consists of an angle support to which the remaining components of the device are attached either directly or indirectly. A pair of pivotal connections attach a weld nozzle holding link to the angle support and provide a two axis freedom of movement of the holding link with respect to the support angle. The manipulator is actuated by a pair of adjusting screws angularly mounted to the angle support. These screws contact a pair of tapered friction surfaces formed on the upper portion of the welding nozzle holding link. A spring positioned between the upper portions of the support angle and the holding link provides a constant bias engagement between the friction surfaces of the holding link and the adjustment screws, so as to firmly hold the link in position and to eliminate any free play in the adjustment mechanism. The angular relationships between the adjustment screws, the angle support and the tapered friction surfaces of the weld nozzle holding link provide a geometric arrangement which permits precision adjustment of the holding link with respect to the angle support and also provides a solid holding link mount which is resistant to movement from outside forces.

NASA



N94-15925*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

ATTACHMENT DEVICE Patent Application

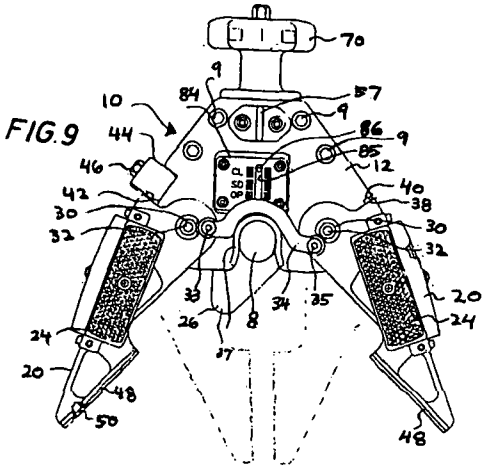
RONALD J. ZAGULI, inventor (to NASA) 14 Apr. 1993 26 p

(NASA-CASE-MSC-21885-1; NAS 1.71:MSC-21885-1; US-PATENT-APPL-SN-048041) Avail: CASI HC A03/MF A01

An apparatus is disclosed for capturing and holding a rod, bar or similar member; the apparatus having in one aspect a body member with a recess 5 therein and a hook extending from the body member, the hook and recess defining a capture envelope for receiving and confining the rod, etc. In one aspect such an apparatus is disclosed in which the hook is movable with respect to the

body member to vary the 10 size of the capture envelope, both to initially facilitate emplacement of the apparatus about the rod, etc., and then to provide for tightening of the apparatus about the rod, etc., if desired.

NASA



N94-15949*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

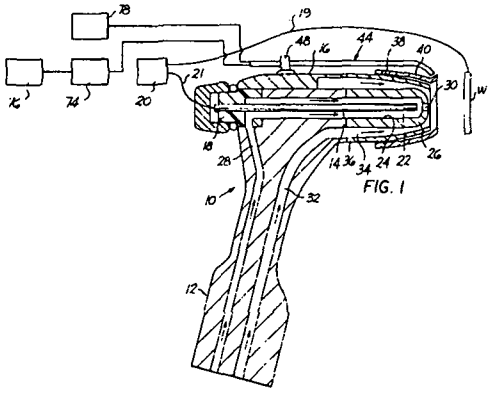
PLASMA ARC WELDING WELD IMAGING Patent Application

DANIEL J. RYBICKI, inventor (to NASA) (Martin Marietta Space Systems, Inc., Huntsville, AL.) and WILLIAM F. MCGEE, inventor (to NASA) (Martin Marietta Space Systems, Inc., Huntsville, AL.) 29 Jul. 1993 12 p

(NASA-CASE-MFS-28797-1; NAS 1.71: MFS- 28797-1; US-PATENT-APPL-SN-098918) Avail: CASI HC A03/MF A01

A welding torch for plasma arc welding apparatus has a transparent shield cup disposed about the constricting nozzle, the cup including a small outwardly extending polished lip. A guide tube extends externally of the torch and has a free end adjacent to the lip. First and second optical fiber bundle assemblies are supported within the guide tube. Light from a strobe light is transmitted along one of the assemblies to the free end and through the lip onto the weld site. A lens is positioned in the guide tube adjacent to the second assembly and focuses images of the weld site onto the end of the fiber bundle of the second assembly and these images are transmitted along the second assembly to a video camera so that the weld site may be viewed continuously for monitoring the welding process.

NASA



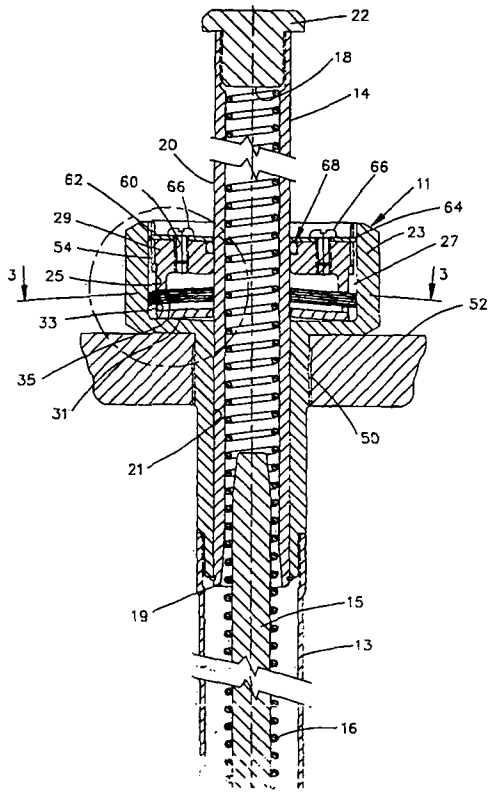
N94-15966*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

MECHANICAL ENERGY ABSORBER Patent Application

CLARENCE J. WESSELSKI, inventor (to NASA) (Lockheed Engineering and Sciences Co., Houston, TX.) 29 Jul. 1993 19 p (NASA-CASE-MSC-22111-1; NAS 1.71:MSC-22111-1; US-PATENT-APPL-SN-098911) Avail: CASI HC A03/MF A01

An energy absorbing system for controlling the force where a moving object engages a stationary stop and where the system utilized telescopic tubular members, energy absorbing diaphragm elements, force regulating disc springs, and a return spring to return the telescoping member to its start position after stroking is presented. The energy absorbing system has frusto-conical diaphragm elements frictionally engaging the shaft and are opposed by a force regulating set of disc springs. In principle, this force feedback mechanism serves to keep the stroking load at a reasonable level even if the friction coefficient increases greatly. This force feedback device also serves to desensitize the singular and combined effects of manufacturing tolerances, sliding surface wear, temperature changes, dynamic effects, and lubricity.

NASA



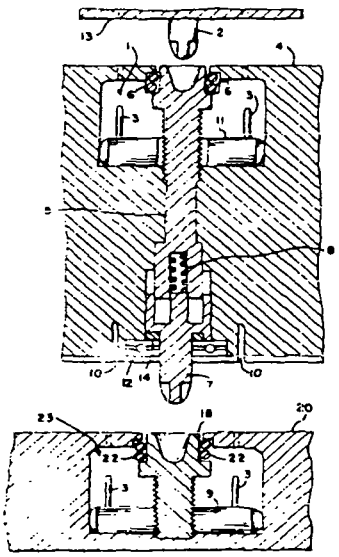
N94-20126* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

SPLINE SCREW PAYLOAD FASTENING SYSTEM Patent

JOHN M. VRANISH, inventor (to NASA) 14 Sep. 1993 16 p Filed 21 Sep. 1992 Supersedes N94-15871 (32 - 3, p 1046) (NASA-CASE-GSC-13454-1; US-PATENT-5,244,406; US-PATENT- APPL-SN-947612; US-PATENT-CLASS-439-362; INT-PATENT-CLASS-H01R-13/00) Avail: US Patent and Trademark Office

A system for coupling an orbital replacement unit (ORU) to a space station structure via the actions of a robot and/or astronaut is described. This system provides mechanical and electrical connections both between the ORU and the space station structure and between the ORU and the ORU and the robot/astronaut hand tool. Alignment and timing features ensure safe, sure handling and precision coupling. This includes a first female type spline connector selectively located on the space station structure, a male type spline connector positioned on the orbital replacement unit so as to mate with and connect to the first female type spline connector, and a second female type spline connector located on the orbital replacement unit. A compliant drive rod interconnects the second female type spline connector and the male type spline connector. A robotic special end effector is used for mating with and driving the second female type spline connector. Also included are alignment tabs exteriorally located on the orbital replacement unit for berthing with the space station structure. The first and second female type spline connectors each include a threaded bolt member having a captured nut member located thereon which can translate up and down the bolt but are constrained from rotation thereabout, the nut member having a mounting surface with at least one first type electrical connector located on the mounting surface for translating with the nut member. At least one complementary second type electrical connector on the orbital replacement unit mates with at least one first type electrical connector on the mounting surface of the nut member. When the driver on the robotic end effector mates with the second female type spline connector and rotates, the male type spline connector and the first female type spline connector lock together, the driver and the second female type spline connector lock together, and the nut members translate up the threaded bolt members carrying the first type electrical connector up to the complementary second type connector for interconnection therewith.

Official Gazette of the U.S. Patent and Trademark Office



N94-20127* *National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.*

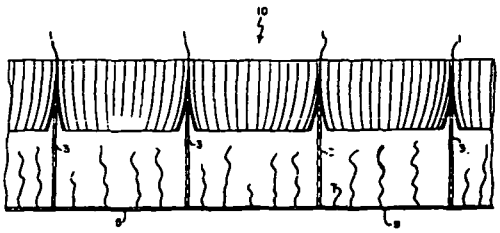
AN IMPROVED PATCH FOR RADIATIVE COOLERS Patent

VINCENT T. BLY, inventor (to NASA) 7 Sep. 1993 7 p Filed 25 Jan. 1993 Supersedes N94-15873 (32 - 3, p 1046)

(NASA-CASE-GSC-13503-1; US-PATENT-5,241,836; US-PATENT-APPL-SN-008427; US-PATENT-CLASS-62-467; US-PATENT-CLASS-165-41; US-PATENT-CLASS-165-904; US-PATENT-CLASS-244-158R; US-PATENT-CLASS-244-158A; US-PATENT-CLASS-244-163; INT-PATENT-CLASS-F25B-23/00) Avail: US Patent and Trademark Office

A unique structure for constructing the emissive patch of a spaceborne radiative cooler is shown. The structure has very high emissivity for all angles up to a designed-in maximum angle and near zero emissivity for greater angles. The structure also allows the use of high emissivity, nonconducting paints while fully complying with the NASA Electrostatic Discharge Susceptibility requirements for spacecraft. To accomplish these tasks, two previous disadvantages of prior art methods are addressed; eliminating background thermal radiation sources and problems concerning the high emissivity paints used in association with the black body radiator. A reflector consisting of an array of parabolic concentrators is separated from a black body element by an electrically conductive spacer. The concentrators serve to limit the field of view while the conductive spacer eliminates the need to use a conductive paint on the emissive element.

Official Gazette of the U.S. Patent and Trademark Office



N94-20365* *National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.*

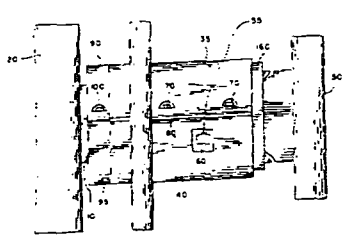
SHAFT MOUNT FOR DATA COUPLER SYSTEM Patent

JAMES R. ELLIOTT, JR., inventor (to NASA) and MARK T. LORD, inventor (to NASA) 16 Nov. 1993 5 p Filed 3 Oct. 1991 Supersedes N92-30097 (30 - 20, p 3480)

(NASA-CASE-LAR-13805-1; US-PATENT-5,261,757; US-PATENT-APPL-SN-770509; US-PATENT-CLASS-403-344; US-PATENT-CLASS-403-24; US-PATENT-CLASS-403-27; US-PATENT-CLASS-403-6; US-PATENT-CLASS-416-61; INT-PATENT-CLASS-F16B-3/06) Avail: US Patent and Trademark Office

A device for mounting a data transmission apparatus to a rotating, tapered, and instrumented shaft is provided. This device permits attachment without interfering with shaft rotation or the accuracy of data output, and prevents both radial and axial slippage of the data transmission apparatus. The mounting device consists of a sleeve assembly which is attached to the shaft by means of clamps that are situated at some distance removed from the instrumented area of the shaft. The data transmission device is secured to the sleeve such that the entire assembly rotates with the shaft. Shim adjustments between sleeve sections assure that a minimum compressive load is transferred to the instrumented area of the shaft and a rubber lining is affixed to a large portion of the interior surface of the sleeve to absorb vibration.

Official Gazette of the U.S. Patent and Trademark Office



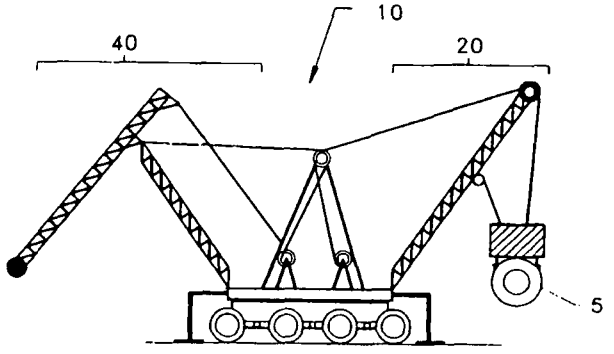
N94-20369* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

COUNTER-BALANCED, MULTIPLE CABLE CONSTRUCTION CRANE Patent

MARTIN M. MIKULAS, JR., inventor (to NASA) and LI-FARN YANG, inventor (to NASA) 19 Oct. 1993 16 p Filed 18 Nov. 1991 Supersedes N92-34212 (30 - 24, p 4189)
(NASA-CASE-LAR-14565-1-CU;US-PATENT-5,253,771; US-PATENT-APPL-SN-793974;US-PATENT-CLASS-212-148; US-PATENT-CLASS-212-196;US-PATENT-CLASS-212-262; INT-PATENT- CLASS-B66C-23/76 Avail: US Patent and Trademark Office

The invention is a counter-balanced, multiple cable construction crane. The apparatus for hoisting payloads comprises a crane having a lifting means, the lifting means comprising an end effector means and three suspension means or cables. One end of each cable attaches to a different winding means located on the lifting means, and the other end of each cable attaches to a different point on the end effector, such that the three cables have a theoretical point of convergence with this point corresponding to the center of mass of the payload. Three controls command rotation of the winding means to a predetermined position. Accordingly, the crane provides precise and autonomous positioning of the payload without human guidance. The crane further comprises a counter-balancing means. Two controls position the counter-balancing means to offset the overturning moment which arises during the lifting of heavy payloads.

Official Gazette of the U.S. Patent and Trademark Office



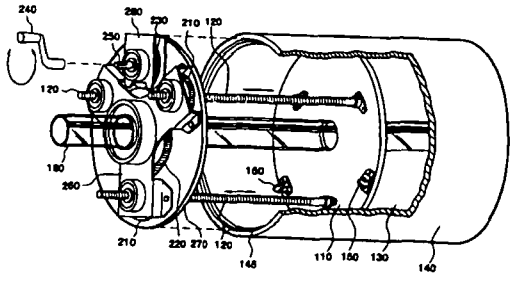
N94-20375* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

THREE POINT LEAD SCREW POSITIONING APPARATUS FOR A CAVITY TUNING PLATE Patent

FRANK S. CALCO, inventor (to NASA) 7 Sep. 1993 7 p Filed 27 Jan. 1992 Supersedes N92-17678 (30 - 8, p 1307)
(NASA-CASE-LEW-15216-1; US-PATENT-5,243,310; US-PATENT-APPL-SN-826547; US-PATENT-CLASS-333-233; US-PATENT-CLASS-315-5.54; INT-PATENT-CLASS-H01P-7/06) Avail: US Patent and Trademark Office

Three lead screws are provided for adjusting the position of a traversing plate. Each of the three lead screws is threaded through a collar that is press fitted through the center of one of three pinion gears. A sun gear meshes with all three pinion gears and transversely moves the three lead screws upon actuation of a drive gear. The drive gear meshes with the sun gear and is driven by a handle or servomotor. When the handle or servomotor rotates the drive gear, the sun gear rotates causing the three pinion gears to rotate, thus, causing transverse movement of the three lead screws and, accordingly, transverse movement of the transversing plate. When the drive gear rotates, the traversing plate is driven in and out of a microwave cavity. Thus, the length or size of the cavity can be tuned while maintaining the traversing plate in an exact parallel relationship with an opposing plate on another end of the cavity.

Official Gazette of the U.S. Patent and Trademark Office



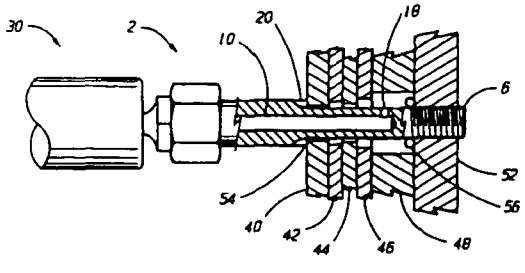
N94-20379* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

MOLD BOLT AND MEANS FOR ACHIEVING CLOSE TOLERANCES BETWEEN BOLTS AND BOLT HOLES Patent

DAVID L. JOHNSTON, inventor (to NASA) and PHILLIP G. BRYANT, inventor (to NASA) 30 Nov. 1993 5 p Filed 27 Jan. 1993 Supersedes N93-30567 (31 - 11, p 3447)
(NASA-CASE-MFS-28720-1;US-PATENT-5,265,994; US-PATENT-APPL-SN-009909;US-PATENT-CLASS-411-82;US-PATENT-CLASS-411-258;US-PATENT-CLASS-411-930;US-PATENT-CLASS-425-129.1;INT-PATENT-CLASS-F16B-39/02; INT-PATENT-CLASS-F16B-39/00) Avail: US Patent and Trademark Office

In the space shuttle, a cargo bay storage rack was required which was to be manufactured from a metal-plastic composite and bolted to a cargo structure. Following completion, utilization of the rack was disallowed due to tolerances, that is, the size differences between the outside bolt diameter and the inside hole diameter. In addition to the space shuttle problem there are other close tolerance requirements for bolts. Such environments often benefit from close tolerance bolting. Frequently such fabrication is not cost effective. Consequently there is a need for means of achieving close tolerances between bolts and bolt holes. Such means are provided. After compressing the elements together a strong rigid plastic, ceramic, or ceramic plastic fluid is forced into a channel extending through the bolt.

Official Gazette of the U.S. Patent and Trademark Office



N94-20380* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

TURNTABLE MECHANISM Patent

WILLIAM NEILL MYERS, inventor (to NASA) 19 Oct. 1993 7 p Filed 31 Jan. 1992 Supersedes N93-31313 (31 - 12, p 3734) (NASA-CASE-MFS-28522-1; US-PATENT-5,254,173; US-PATENT-APPL-SN-828612; US-PATENT-CLASS-118-728; US-PATENT-CLASS-118-500; US-PATENT-CLASS-118-730; US-PATENT-CLASS-269-71; INT-PATENT-CLASS-B05C-13/00) Avail: US Patent and Trademark Office

In vacuum plasma spraying a turntable must be provided which not only makes it possible to rotate and tilt a heavy workpiece, but to operate at vacuum plasma temperatures to do so. In the vacuum plasma coating of large parts such as combustion chambers of rocket engines, the workpiece must not only be rotated, but it must be tilted. Hence, the turntable must be capable not only of supporting heavy parts, but of angulating such heavy workpieces. And this must be done without drive means failure due to extremely high temperatures under which the turntable mechanism is operated. A turntable mechanism is provided which is capable of operating under such conditions. For cooling the turntable drive mechanism, internal cooling means are included.

Official Gazette of the U.S. Patent and Trademark Office

N94-20494*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

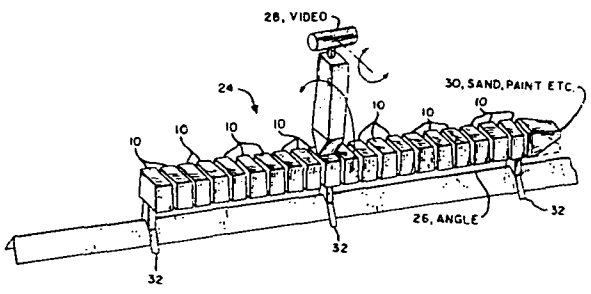
CLIMBING ROBOT Patent

JAMES J. KERLEY, inventor (to NASA), EDWARD L. MAY, inventor (to NASA), and WAYNE D. ECKLUND, inventor (to NASA) 2 Nov. 1993 21 p Filed 10 Feb. 1992 Supersedes N92-23547 (30 - 14, p 2382)

(NASA-CASE-GSC-13442-1; US-PATENT-5,257,669; US-PATENT-APPL-SN-843861; US-PATENT-CLASS-180-7.1; US-PATENT-CLASS-901-1; INT-PATENT-CLASS-B62D-57/024; INT-PATENT-CLASS-B25J-5/00) Avail: US Patent and Trademark Office

A mobile robot for traversing any surface consisting of a number of interconnected segments, each interconnected segment having an upper 'U' frame member, a lower 'U' frame member, a compliant joint between the upper 'U' frame member and the lower 'U' frame member, a number of linear actuators between the two frame members acting to provide relative displacement between the frame members, a foot attached to the lower 'U' frame member for adherence of the segment to the surface, an inter-segment attachment attached to the upper 'U' frame member for interconnecting the segments, a power source connected to the linear actuator, and a computer/controller for independently controlling each linear actuator in each interconnected segment such that the mobile robot moves in a caterpillar like fashion.

Official Gazette of the U.S. Patent and Trademark Office



N94-20587* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

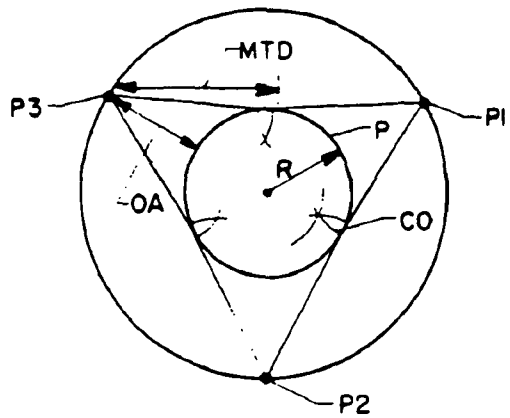
METHOD FOR REMOTELY POWERING A DEVICE SUCH AS A LUNAR ROVER Patent

RUSSELL J. DEYOUNG, inventor (to NASA), MICHAEL D. WILLIAMS, inventor (to NASA), GILBERT H. WALKER, inventor (to NASA), GREGORY L. SCHUSTER, inventor (to NASA), and JA H. LEE, inventor (to NASA) 9 Nov. 1993 13 p Filed 6 Jan. 1992 Supersedes N92-30388 (30 - 21, p 3658)

(NASA-CASE-LAR-14789-1; US-PATENT-5,260,639; US-PATENT-APPL-SN-822457; US-PATENT-CLASS-322-2R; US-PATENT-CLASS-244-1R; US-PATENT-CLASS-372-43; INT-PATENT-CLASS-B64G-1/10) Avail: US Patent and Trademark Office

A method of supplying power to a device such as a lunar rover located on a planetary surface is provided. At least one, and preferably three, laser satellites are set in orbit around the planet. Each satellite contains a nuclear reactor for generating electrical power. This electrical power is converted into a laser beam which is passed through an amplifying array and directed toward the device such as a lunar rover. The received laser beam is then converted into electrical power for use by the device.

Official Gazette of the U.S. Patent and Trademark Office



N94-20589* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

HIGH-TEMPERATURE, HIGH-PRESSURE OXYGEN METERING VALVE Patent

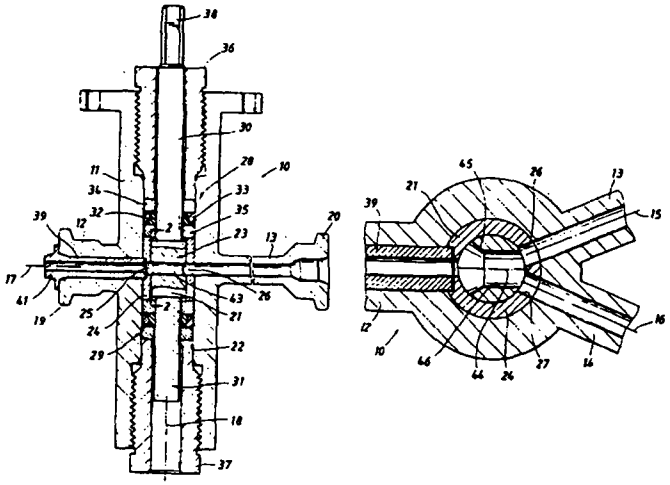
ROLLIN C. CHRISTIANSON, inventor (to NASA), PETER P. LYCOU, inventor (to NASA), and JAMES A. DANIEL, inventor (to NASA) 12 Oct. 1993 9 p Filed 14 Aug. 1992 Supersedes N93-14843 (31 - 4, p 891)

(NASA-CASE-MSC-21823-1; US-PATENT-5,251,663; US-PATENT-APPL-SN-929552; US-PATENT-CLASS-137-876; US-PATENT-CLASS-251-214; US-PATENT-CLASS-137-625.47; INT-PATENT-CLASS-F16K-5/04) Avail: US Patent and Trademark Office

A control valve includes a body defining a central cavity arranged between a fluid inlet and outwardly-diverging first and second fluid outlets respectively disposed in a common transverse plane. A valve member is arranged in the cavity for rotation between first and second operating positions where a transverse fluid passage through the valve member alternatively communicates the fluid inlet with one or the other of the fluid outlets. To minimize fluid turbulence when the valve member is rotated to an alternate operating position, the fluid passage has a convergent entrance for maintaining the passage in

permanent communication with the fluid inlet as well as an oblong exit opening with spaced side walls for enabling the exit opening to temporarily span the first and second fluid outlets as the valve member is turned between its respective operating positions.

Official Gazette of the U.S. Patent and Trademark Office



N94-23078* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

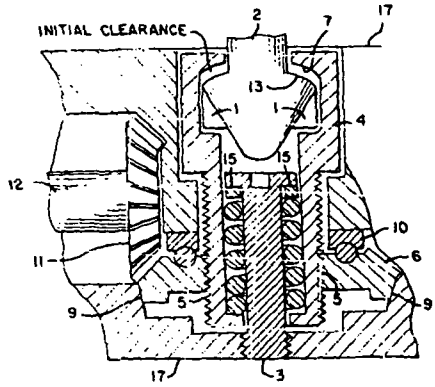
SPLINE SCREW MULTIPLE ROTATIONS MECHANISM Patent

JOHN M. VRANISH, inventor (to NASA) 21 Dec. 1993 10 p Filed 17 Sep. 1992

(NASA-CASE-GSC-13452-1; US-PATENT-5,271,286; US-PATENT-APPL-SN-946111; US-PATENT-CLASS-74-89.15; US-PATENT-CLASS-244-161; US-PATENT-CLASS-403-13; US-PATENT-CLASS-403-24; US-PATENT-CLASS-439-362; INT-PATENT-CLASS-F16H-25/20; INT-PATENT-CLASS-F16D-1/00) Avail: US Patent and Trademark Office

A system for coupling two bodies together and for transmitting torque from one body to another with mechanical timing and sequencing is reported. The mechanical timing and sequencing is handled so that the following criteria are met: (1) the bodies are handled in a safe manner and nothing floats loose in space, (2) electrical connectors are engaged as long as possible so that the internal processes can be monitored throughout by sensors, and (3) electrical and mechanical power and signals are coupled. The first body has a splined driver for providing the input torque. The second body has a threaded drive member capable of rotation and limited translation. The embedded drive member will mate with and fasten to the splined driver. The second body has an embedded bevel gear member capable of rotation and limited translation. This bevel gear member is coaxial with the threaded drive member. A compression spring provides a preload on the rotating threaded member, and a thrust bearing is used for limiting the translation of the bevel gear member so that when the bevel gear member reaches the upward limit of its translation the two bodies are fully coupled and the bevel gear member then rotates due to the input torque transmitted from the splined driver through the threaded drive member to the bevel gear member. An output bevel gear with an attached output drive shaft is embedded in the second body and meshes with the threaded rotating bevel gear member to transmit the input torque to the output drive shaft.

Official Gazette of the U.S. Patent and Trademark Office



N94-23082* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

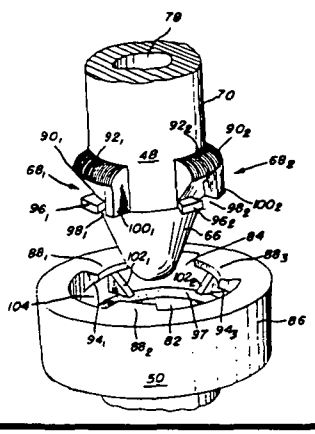
SPLIT SPLINE SCREW Patent

JOHN M. VRANISH, inventor (to NASA) 16 Nov. 1993 8 p Filed 27 Jul. 1992

(NASA-CASE-GSC-13434-1; US-PATENT-5,261,758; US-PATENT-APPL-SN-918747; US-PATENT-CLASS-403-348; US-PATENT-CLASS-403-359; US-PATENT-CLASS-901-30; INT-PATENT-CLASS-F16B-3/00; INT-PATENT-CLASS-B25J-11/00) Avail: US Patent and Trademark Office

A split spline screw type payload fastener assembly, including three identical male and female type split spline sections, is discussed. The male spline sections are formed on the head of a male type spline driver. Each of the split male type spline sections has an outwardly projecting load baring segment including a convex upper surface which is adapted to engage a complementary concave surface of a female spline receptor in the form of a hollow bolt head. Additionally, the male spline section also includes a horizontal spline releasing segment and a spline tightening segment below each load bearing segment. The spline tightening segment consists of a vertical web of constant thickness. The web has at least one flat vertical wall surface which is designed to contact a generally flat vertically extending wall surface tab of the bolt head. Mutual interlocking and unlocking of the male and female splines results upon clockwise and counter clockwise turning of the driver element.

Official Gazette of the U.S. Patent and Trademark Office



N94-23822* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

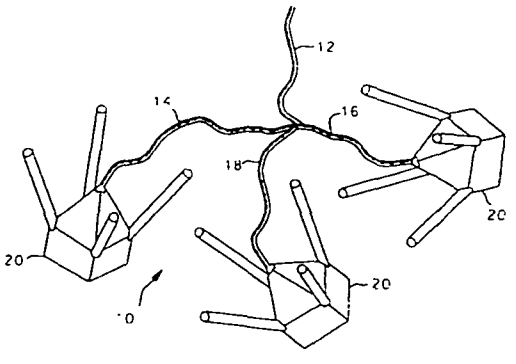
FINGERED BOLA BODY, BOLA WITH SAME, AND METHODS OF USE Patent

JOHN M. DZENITIS, inventor (to NASA) and LINDA W. BILLICA, inventor (to NASA) 18 Jan. 1994 7 p Filed 5 Jun. 1992 Supersedes N92-30026 (30 - 20, p 3479)

(NASA-CASE-MSC-21967-1; US-PATENT-5,279,482; US-PATENT-APPL-SN-892053; US-PATENT-CLASS-244-161; US-PATENT-CLASS-294-86.1; US-PATENT-CLASS-294-66.1; US-PATENT-CLASS-273-84R; US-PATENT-CLASS-102-504; INT-PATENT-CLASS-B64G-1/64) Avail: US Patent and Trademark Office

The present invention discloses bola bodies, bolas, and a snaring method which makes use such devices. A bola body, according to the present invention, is nonspherical or irregular in shape rather than a smooth sphere or ovoid body. One or more fingers extends from the bola body. These fingers may be relatively straight or they may have crooked or bent portions to enhance entanglement with a bola line or lines or with each other. Two or more of such fingers may be used and may be regularly or irregularly spaced apart on a bola body. A bola with such bodies includes lines which are connected to the other bodies. In one particular embodiment of a bola body, according to the present invention, the body has an irregular shape with a bottom rectangular portion and a top pyramid portion forming a nose. A plurality of fingers is extended from the pyramidal top portion with one finger extended up and away from each of four corners of the top portion. Such a bola body tends to be initially oriented with its nose and fingers against an object being snared since the body is pulled nose first when a bola line is secured at the tip of the pyramidal portion of the bola body. With such a bola, an unwrapping bola body can slip around a target member so that two of the rod-shaped fingers catch a bola line and guide it into an area or crook between the fingers and a side of the top pyramidal portion of the bola body. Tension on the bola line maintains the line in the crook and tends to press the fingers against the unwrapped target member to stabilize the wrapping of the line about the target member. With such a bola, it is difficult for two or more lines unwrapping in different directions to move past one another without being forced together by line tension. Also, the fingers of such bola bodies may hook and hold each other. The fingers may also hook or entangle some object on or portion of the target member. A probable known target member has known dimensions and shapes so that the bola may be sized and configured to reliably snare such a known target. The bolas can be optimally sized, fashioned, and configured to contact and hold a probable target of known size, dimension, and shape.

Official Gazette of the U.S. Patent and Trademark Office



N94-23831* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

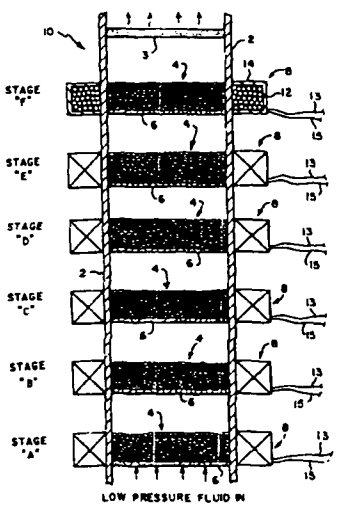
MAGNETIC POWER PISTON FLUID COMPRESSOR Patent

MAX G. GASSER, inventor (to NASA) 4 Jan. 1994 9 p Filed 2 Mar. 1993

(NASA-CASE-GSC-13565-1; US-PATENT-5,275,537; US-PATENT-APPL-SN-024971; US-PATENT-CLASS-417-48; US-PATENT-CLASS-417-50; INT-PATENT-CLASS-F04B-37/00) Avail: US Patent and Trademark Office

A compressor with no moving parts in the traditional sense having a housing having an inlet end allowing a low pressure fluid to enter and an outlet end allowing a high pressure fluid to exit is described. Within the compressor housing is at least one compression stage to increase the pressure of the fluid within the housing. The compression stage has a quantity of magnetic powder within the housing, is supported by a screen that allows passage of the fluid, and a coil for selectively providing a magnetic field across the magnetic powder such that when the magnetic field is not present the individual particles of the powder are separated allowing the fluid to flow through the powder and when the magnetic field is present the individual particles of the powder pack together causing the powder mass to expand preventing the fluid from flowing through the powder and causing a pressure pulse to compress the fluid.

Official Gazette of the U.S. Patent and Trademark Office



N94-23969* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

ELECTROMAGNETIC BRAKE/CLUTCH DEVICE Patent

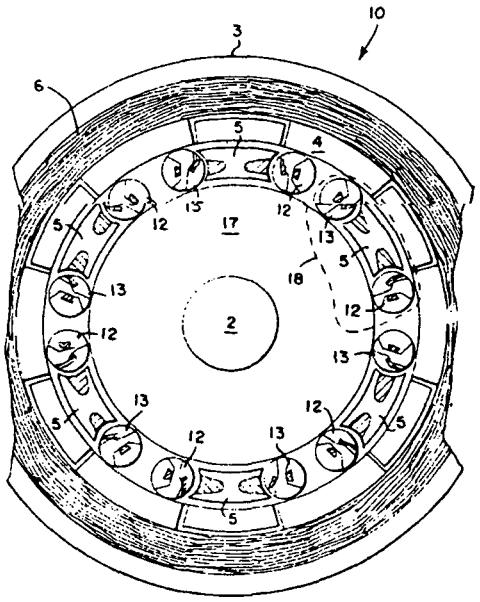
JOHN M. VRANISH, inventor (to NASA) 4 Jan. 1994 11 p Filed 3 Dec. 1992

(NASA-CASE-GSC-13502-1; US-PATENT-5,275,261; US-PATENT-APPL-SN-986632; US-PATENT-APPL-CLASS-188-82.2; US-PATENT-CLASS-188-82.3; US-PATENT-CLASS-188-82.84; US-PATENT-CLASS-188-163; US-PATENT-CLASS-188-171; US-PATENT-CLASS-192-44; US-PATENT-CLASS-192-45.1) Avail: US Patent and Trademark Office

An electromagnetic brake/clutch device includes a drive shaft supported by at least one bearing for transmitting torque, a housing, affixed to prevent its rotation, surrounding the drive shaft, and an electromagnetically activated device within the housing to selectively prevent and allow rotation of the drive shaft. The electromagnetically activated device includes a plurality of cammed rollers to

prevent counter-clockwise rotation of the drive shaft. The drive shaft includes a circumferential disk and the housing includes a reaction ring for engagement with the plurality of cammed rollers. The plurality of cammed rollers are released from engagement with the circumferential disk and the reaction ring by a plurality of tripping mechanisms within the housing. The tripping action uses the locking force to act as a release force merely by changing the boundary conditions of the roller interface angles. The tripping mechanisms include trippers for disengaging the plurality of cammed rollers and an anvil shaped portion for providing lateral movement of the trippers. The plurality of cammed rollers is preloaded to engagement with the circumferential disk and reaction ring by a spring, and is located with respect to an adjacent tripping mechanism with another spring.

Official Gazette of the U.S. Patent and Trademark Office



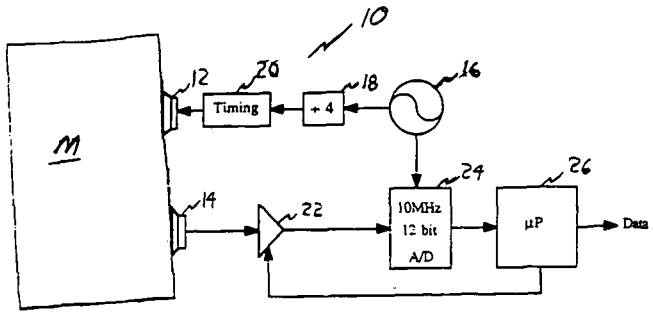
38
QUALITY ASSURANCE AND RELIABILITY

Includes product sampling procedures and techniques; and quality control.

N94-15870*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
SYNCHRONOUS SAMPLING PHASE AND AMPLITUDE DETECTION METHOD AND APPARATUS Patent Application
MARK E. FROGGATT, inventor (to NASA) 19 Aug. 1993 26 p (NASA-CASE-LAR-14725-1; NAS 1.71:LAR-14725-1; US-PATENT-APPL-SN-110255) Avail: CASI HC A03/MF A01

A synchronous sampling phase and amplitude detection method and apparatus is described. An oscillator generates a signal at a particular frequency and then a frequency dividing circuit divides this signal frequency by a factor of four. This divided signal is transmitted via a transducer through a material and received by the same or another transducer. The received signal is then digitized. The received signal is next sampled at four times its frequency based on a reference signal from the oscillator and then characterized as a phasor. The phase and amplitude of the received signal are then calculated via trigonometric relationship of at least two samples separated by 90 degrees. The remaining samples are employed to reduce the noise equivalent bandwidth.

NASA



39
STRUCTURAL MECHANICS

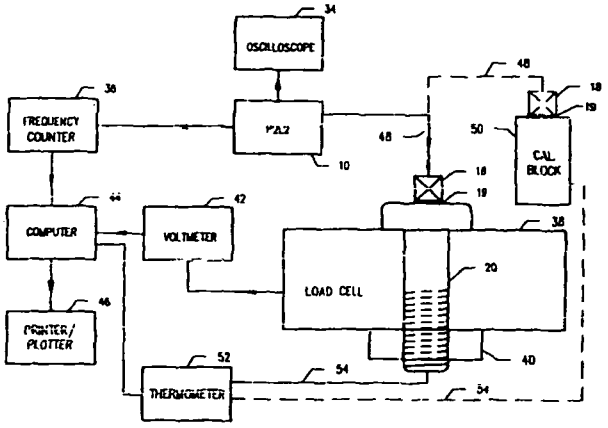
Includes structural element design and weight analysis; fatigue; and thermal stress.

N94-10671* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
METHOD OF RECERTIFYING A LOADED BEARING MEMBER USING A PHASE POINT Patent
JOSEPH S. HEYMAN, inventor (to NASA) 17 Aug. 1993 13 p Filed 19 Jun. 1991 Supersedes N92-11384 (29 - 2, p 249) (NASA-CASE-LAR-14741-1; US-PATENT-5,237,516; US-PATENT-APPL-SN-720153; US-PATENT-CLASS-364-508; US-PATENT-CLASS-73-761; US-PATENT-CLASS-73-862.59; US-PATENT-CLASS-364-571.03; INT-PATENT-CLASS-G01H-1/00; INT-PATENT-CLASS-G01N-29/16) Avail: US Patent and Trademark Office

A method of recertifying a load on a bearing member using a pulsed phase locked loop (P2L2) system is disclosed. A first tone burst signal with a corresponding first phase signal is generated in the bearing member in a first load condition. The sample/hold of the P2L2 is adjusted to a determined phase point on the first phase signal and then the P2L2 is locked at this phase period to determine a first load measurement. Next, the phase sample point is correlated with a corresponding position, w, on the first tone burst signal. A second tone burst with a corresponding second phase signal is then generated at some later time in the bearing member in a second load condition. The sample/hold is adjusted to the sample/hold phase point as before and then the output frequency of the P2L2 is adjusted

until the sample/hold is positioned at the previously determined phase point corresponding to position w on the second tone burst signal. The P2L2 is then locked at this phase point to determine a frequency indicative of the load of the second loading condition.

Official Gazette of the U.S. Patent and Trademark Office



N94-23308* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

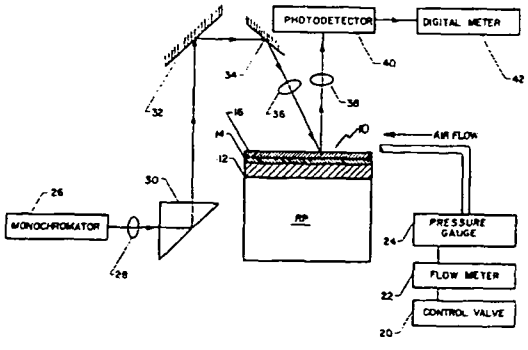
METHOD OF DETERMINING SHEAR STRESS EMPLOYING A MONOMER-POLYMER LAMINATE STRUCTURE Patent

JAG J. SINGH, inventor (to NASA), ABE EFTEKHARI, inventor (to NASA), and DEVENDRA S. PARMAR, inventor (to NASA) 14 Dec. 1993 12 p Filed 8 Feb. 1993 Division of US- Patent- Appl-SN-849612, filed 2 Mar. 1992

(NASA-CASE-LAR-14654-2;US-PATENT-5,270,781;US-PATENT-APPL-SN-014960;US-PATENT-APPL-SN-849612; US-PATENT-CLASS-356-32;US-PATENT-CLASS-428-1; US-PATENT-CLASS-428-409;US-PATENT-CLASS-428-480; US-PATENT-CLASS-428-913; US-PATENT- CLASS-359-67) Avail: US Patent and Trademark Office

A laminate structure attached to the test surface of an article is presented. The laminate structure is comprised of a liquid crystal polymer substrate. A light absorbing coating is applied to the substrate and is thin enough to permit bonding steric interaction between the liquid crystal polymer substrate and an overlying liquid crystal monomer thin film. Light is directed through and reflected by the liquid crystal monomer thin film and unreflected light is absorbed by the underlying coating. The wavelength of the reflected light is indicative of the shear stress experienced by the test surface.

Official Gazette of the U.S. Patent and Trademark Office



44
ENERGY PRODUCTION AND CONVERSION

Includes specific energy conversion systems, e.g., fuel cells; global sources of energy; geophysical conversion; and windpower.

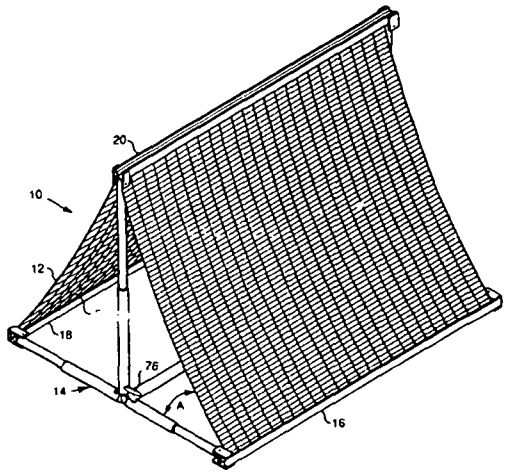
N94-20196* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

SELF-DEPLOYING PHOTOVOLTAIC POWER SYSTEM Patent

ANTHONY J. COLOZZA, inventor (to NASA) 14 Sep. 1993 8 p Filed 2 Apr. 1992 Supersedes N92-24057 (30 - 14, p 2404) (NASA-CASE-LEW-15308-1; US-PATENT-5,244,508; US-PATENT-APPL-SN-862113; US-PATENT-CLASS-136-245; US-PATENT-CLASS-136-292; INT-PATENT-CLASS-H01L-31/45) Avail: US Patent and Trademark Office

A lightweight flexible photovoltaic (PV) blanket is attached to a support structure of initially stowed telescoping members. The deployment mechanism comprises a series of extendable and rotatable columns. As these columns are extended the PV blanket is deployed to its proper configuration.

Official Gazette of the U.S. Patent and Trademark Office



51
LIFE SCIENCES (GENERAL)

N94-15967*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

QUANTITATIVE METHOD OF MEASURING CANCER CELL UROKINASE AND METASTATIC POTENTIAL Patent Application

DENNIS R. MORRISON, inventor (to NASA) 27 Jul. 1993 27 p (NASA-CASE-MSC-21715-1; NAS 1.71:MSC-21715-1; US-PATENT-APPL-SN-097186) Avail: CASI HC A03/MF A01

The metastatic potential of tumors can be evaluated by the quantitative detection of urokinase and DNA. The cell sample selected for examination is analyzed for the presence of high levels of urokinase and abnormal DNA using analytical flow cytometry and digital image analysis. Other factors such as membrane associated urokinase, increased DNA synthesis rates and certain receptors can be used in the method for detection of potentially invasive tumors.

NASA

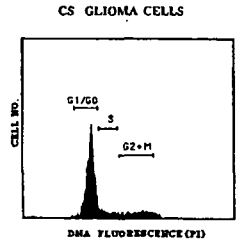


Figure 1A

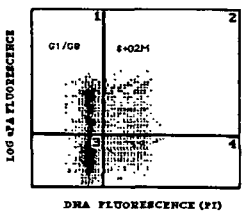


Figure 1B

N94-15969*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

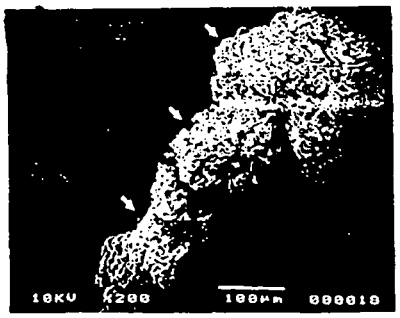
CULTURED NORMAL MAMMALIAN TISSUE AND PROCESS Patent Application

THOMAS J. GOODWIN, inventor (to NASA) (Krug Life Sciences, Inc., Houston, TX.), TACEY L. PREWETT, inventor (to NASA), DAVID A. WOLF, inventor (to NASA), and GLENN F. SPAULDING, inventor (to NASA) 25 May 1993 40 p

(NASA-CASE-MSC-21984-1; NAS 1.71:MSC-21984-1; US-PATENT-APPL-SN-066292) Avail: CASI HC A03/MF A01

Normal mammalian tissue and the culturing process has been developed for the three groups of organ, structural and blood tissue. The cells are grown in vitro under microgravity culture conditions and form three dimensional cell aggregates with normal cell function. The microgravity culture conditions may be microgravity or simulated microgravity created in a horizontal rotating wall culture vessel.

NASA



52
AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

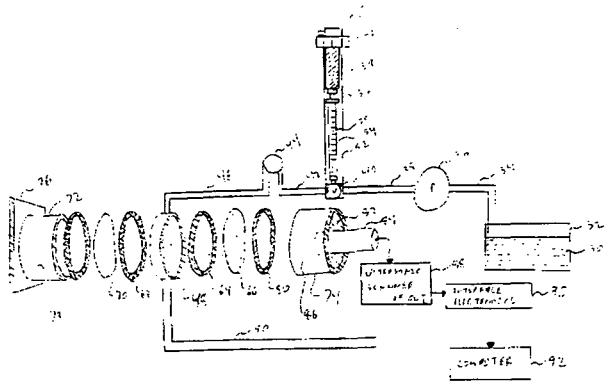
N94-17085*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

METHOD AND APPARATUS TO CHARACTERIZE ULTRASONICALLY REFLECTIVE CONTRAST AGENTS Patent Application

ROBERT A. PRETLOW, III, inventor (to NASA) (Lockheed Engineering and Sciences Co., Hampton, VA.) 15 Nov. 1993 27 p (NASA-CASE-LAR-14969-1; NAS 1.71:LAR-14969-1; US-PATENT-APPL-SN-153930) Avail: CASI HC A03/MF A01

A method and apparatus for characterizing the time and frequency response of an ultrasonically reflective contrast agent is disclosed. An ultrasonically reflective contrast agent is injected, under constant pressure, into a fluid flowing through a pump flow circuit. The fluid and the ultrasonically reflective contrast agent are uniformly mixed in a mixing chamber, and the uniform mixture is passed through a contrast agent chamber. The contrast agent chamber is acoustically and axially interposed between an ultrasonic transducer chamber and an acoustic isolation chamber. A pulse of ultrasonic energy is transmitted into the contrast agent chamber from the ultrasonic transducer chamber. An echo waveform is received from the ultrasonically reflective contrast agent, and it is analyzed to determine the time and frequency response of the ultrasonically reflective contrast agent.

NASA



N94-20372* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

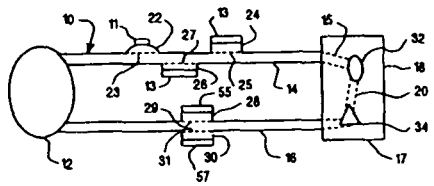
EXTRA-CORPOREAL BLOOD ACCESS, SENSING, AND RADIATION METHODS AND APPARATUSES Patent

KENT D. CASTLE, inventor (to NASA) 16 Nov. 1993 10 p Filed 16 Sep. 1991 Supersedes N92-11627 (30 - 2, p 289) (NASA-CASE-MSC-21775-1; US-PATENT-5,261,874; US-PATENT-APPL-SN-760633; US-PATENT-CLASS-604-4; US-PATENT-CLASS-604-28; INT-PATENT-CLASS-A61M-1/03) Avail: US Patent and Trademark Office

The described invention is related to extra-corporeal blood access and radiation methods and apparatuses and, in particular, to subjecting flowing blood to energy in variety of forms, including radiation, electromagnetic force fields or atomic particles. It is

directed to methods and apparatuses for accessing flowing blood and for subjecting the blood to electrical conductive, electrostatic or electromagnetic fields or for radiating the blood with some type of radiation, e.g., radio waves, ultrasonic or audio waves, microwaves, IR rays, visible light, UV radiation, x-rays, alpha, beta or gamma rays. An apparatus is employed which includes one or more access ports or windows for radiating blood and/or for sensing/analyzing blood. This invention is useful for killing viruses and bacteria in blood, monitoring blood for medical purposes, genetic modification of blood, and analyzing and/or treating blood components.

Official Gazette of the U.S. Patent and Trademark Office



54

MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

N94-15883*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

INFLATABLE RESCUE DEVICE Patent Application

SCOTT A. SWAN, inventor (to NASA) 4 May 1993 21 p (NASA-CASE-MSC-22244-1; NAS 1.71:MSC-22244-1; US-PATENT-APPL-SN-066274) Avail: CASI HC A03/MF A01

This invention discloses, in one aspect, a personal rescue device for use in outer space which has an inflatable flexible tube with a shaper apparatus herein. Gas under pressure flows through the shaper apparatus and into the flexible tube. The flexible tube is mounted to the shaper so that as it inflates it expands and deploys lengthwise away from the shaper. In one embodiment a housing contains the shaper and the flexible tube and the housing is designed to facilitate movement of the expanding tube from the housing so the expanding tube does not bunch up in the housing.

NASA

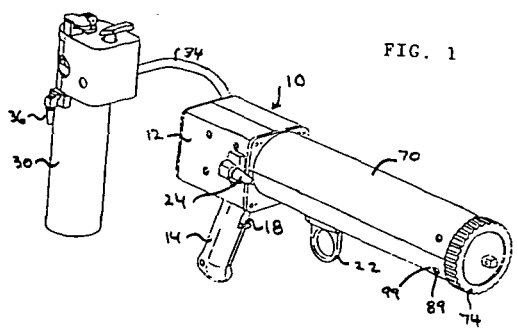


FIG. 1

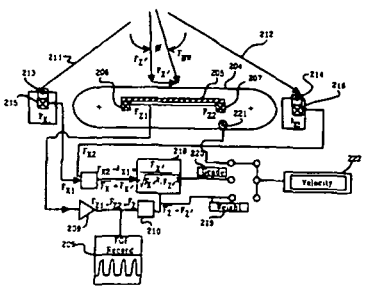
N94-20194* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

APPARATUS AND METHOD FOR MEASURING SUBJECT WORK RATE ON AN EXERCISE DEVICE Patent

WILLIAM E. THORNTON, inventor (to NASA) 7 Sep. 1993 19 p Filed 15 Oct. 1991 Supersedes N92-17910 (30 - 8, p 1335) (NASA-CASE-MSC-21752-1; US-PATENT-5,242,339; US-PATENT-APPL-SN-775404; US-PATENT-CLASS-482-8; US-PATENT-CLASS-482-54; US-PATENT-CLASS-73-379.01; INT-PATENT-CLASS-A63B-22/02; INT-PATENT-CLASS-A63B-71/00) Avail: US Patent and Trademark Office

Method and apparatus for accurately simulating locomotion in a weightless environment, especially to prevent atrophy of a subject's musculoskeletal and cardiorespiratory systems during space travel, are disclosed. Forces, including the vertical, horizontal, and lateral force generated by an individual during locomotion on a treadmill using a rigid belt with rigid transfer elements supported by low friction bogies, are measured by strain gauges sensitive in their respective direction. The vertical forces produced by securing the subject to the treadmill via bungee cords, in conjunction with the measured velocity of the treadmill and the mode of locomotion, are used to determine the subject's equivalent weight. The other horizontal and lateral forces are used to determine the external work produced by the subject when locomotion is performed on a nonlevel surface with an effective grade angle. The measured forces are related in such a way that the grade angle is easily determined. A motor and additional circuitry can be added to the apparatus to measure and force a subject to maintain a predetermined work rate associated with a preselected grade angle and tread velocity.

Official Gazette of the U.S. Patent and Trademark Office



N94-20493* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

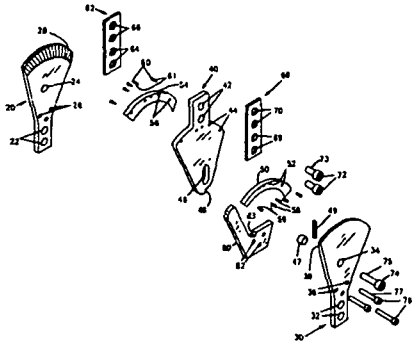
AUTOMATIC LOCKING ORTHOTIC KNEE DEVICE Patent

BRUCE C. WEDDENDORF, inventor (to NASA) 7 Dec. 1993 8 p Filed 26 Dec. 1991 Supersedes N92-17866 (30 - 8, p 1335) (NASA-CASE-MFS-28633-1; US-PATENT-5,267,950; US-PATENT-APPL-SN-813629; US-PATENT-CLASS-602-26; US-PATENT-CLASS-602-16; US-PATENT-CLASS-623-43; US-PATENT-CLASS-623-44; INT-PATENT-CLASS-A61F-5/00) Avail: US Patent and Trademark Office

An articulated tang in clevis joint for incorporation in newly manufactured conventional strap-on orthotic knee devices or for replacing such joints in conventional strap-on orthotic knee devices is discussed. The instant tang in clevis joint allows the user the freedom to extend and bend the knee normally when no load (weight) is applied to the knee and to automatically lock the knee when the user transfers weight to the knee, thus preventing a damaged knee from bending uncontrollably when weight is applied to the knee. The tang in clevis joint of the present invention includes first and second clevis plates, a tang assembly and a spacer plate secured between the clevis plates. Each clevis plate includes a

bevelled serrated upper section. A bevelled shoe is secured to the tank in close proximity to the bevelled serrated upper section of the clevis plates. A coiled spring mounted within an oblong bore of the tang normally urges the shoes secured to the tang out of engagement with the serrated upper section of each clevic plate to allow rotation of the tang relative to the clevis plate. When weight is applied to the joint, the load compresses the coiled spring, the serrations on each clevis plate dig into the bevelled shoes secured to the tang to prevent relative movement between the tang and clevis plates. A shoulder is provided on the tang and the spacer plate to prevent overextension of the joint.

Official Gazette of the U.S. Patent and Trademark Office



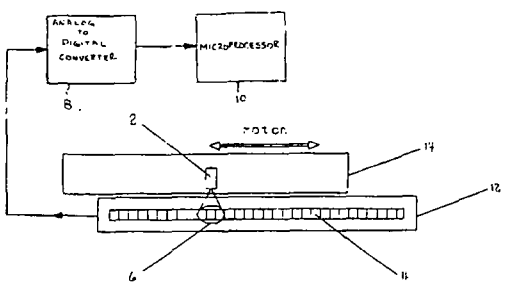
61
COMPUTER PROGRAMMING AND SOFTWARE

Includes computer programs, routines, and algorithms, and specific applications, e.g., CAD/CAM.

N94-15703*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
LINEAR ENCODING DEVICE Patent Application
DOUGLAS B. LEVITON, inventor (to NASA) 29 Mar. 1993 22 p (NASA-CASE-GSC-13562-1; NAS 1.71:GSC-13562-1; US-PATENT-APPL-SN-037876) Avail: CASI HC A03/MF A01

A Linear Motion Encoding device for measuring the linear motion of a moving object is disclosed in which a light source is mounted on the moving object and a position sensitive detector such as an array photodetector is mounted on a nearby stationary object. The light source emits a light beam directed towards the array photodetector such that a light spot is created on the array. An analog-to-digital converter, connected to the array photodetector is used for reading the position of the spot on the array photodetector. A microprocessor and memory is connected to the analog-to-digital converter to hold and manipulate data provided by the analog-to-digital converter on the position of the spot and to compute the linear displacement of the moving object based upon the data from the analog-to-digital converter.

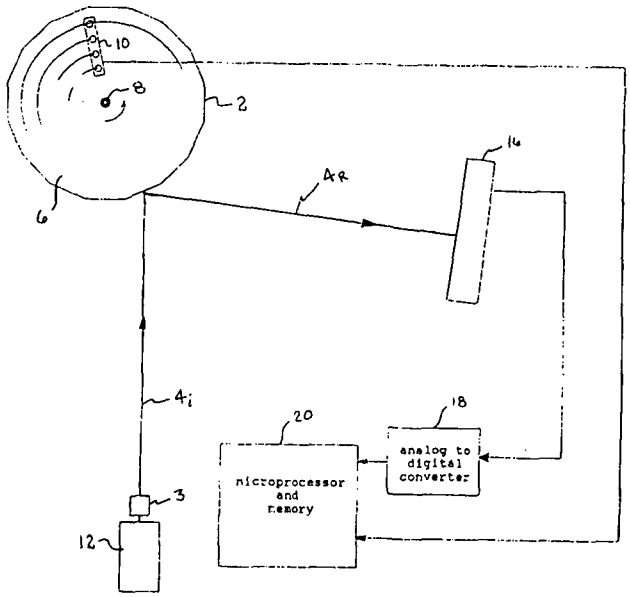
NASA



N94-15943*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
ROTARY ENCODING DEVICE Patent Application
DOUGLAS B. LEVITON, inventor (to NASA) 25 Feb. 1993 26 p (NASA-CASE-GSC-13556-1; NAS 1.71:GSC-13556-1; US-PATENT-APPL-SN-022219) Avail: CASI HC A03/MF A01

A device for position encoding of a rotating shaft in which a polygonal mirror having a number of facets is mounted to the shaft and a light beam is directed towards the facets is presented. The facets of the polygonal mirror reflect the light beam such that a light spot is created on a linear array detector. An analog-to-digital converter is connected to the linear array detector for reading the position of the spot on the linear array detector. A microprocessor with memory is connected to the analog-to-digital converter to hold and manipulate the data provided by the analog-to-digital converter on the position of the spot and to compute the position of the shaft based upon the data from the analog-to-digital converter.

NASA

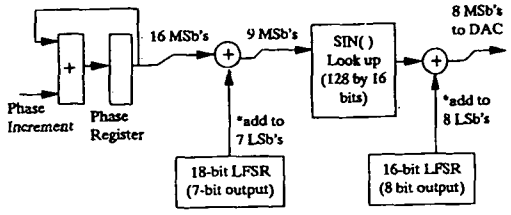


N94-17326*# National Aeronautics and Space Administration. Pasadena Office, CA.
METHOD AND APPARATUS FOR SPUR-REDUCED DIGITAL SINUSOID SYNTHESIS Patent Application
GEORGE A. ZIMMERMAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and MICHAEL J. FLANAGAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 20 Oct. 1993 56 p
(Contract NAS7-918)
(NASA-CASE-NPO-18789-1-CU; NAS 1.71:NPO-18789-1-CU; US-PATENT-APPL-SN-141295) Avail: CASI HC A04/MF A01

A technique for reducing the spurious signal content in digital sinusoid synthesis is presented. Spur reduction is accomplished through dithering both amplitude and phase values prior to word-length reduction. The analytical approach developed for analog quantization is used to produce new bounds on spur performance in these dithered systems. Amplitude dithering allows output word-length reduction without introducing additional spurs. Effects of periodic dither similar to that produced by a pseudo-noise (PN) generator are analyzed. This phase dithering method provides a spur reduction of 6(M + 1) dB per phase bit when the dither consists

of M uniform variates. While the spur reduction is at the expense of an increase in system noise, the noise power can be made white, making the power spectral density small. This technique permits the use of a smaller number of phase bits addressing sinusoid look-up tables, resulting in an exponential decrease in system complexity. Amplitude dithering allows the use of less complicated multipliers and narrower data paths in purely digital applications, as well as the use of coarse-resolution, highly-linear digital-to-analog converters (DACs) to obtain spur performance limited by the DAC linearity rather than its resolution.

NASA



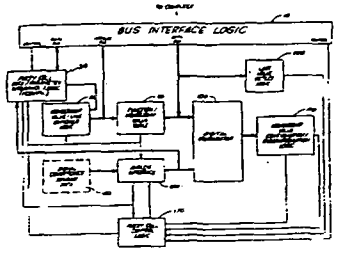
N94-20492* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

RECONFIGURABLE FUZZY CELL Patent

GEORGE A. SALAZAR, inventor (to NASA) 2 Nov. 1993 32 p Filed 18 Sep. 1991 Supersedes N92-10331 (30 - 1, p 62) (NASA-CASE-MSC-21613-1; US-PATENT-5,259,063; US-PATENT-APPL-SN-761566; US-PATENT-CLASS-395-3; US-PATENT-CLASS-395-61; US-PATENT-CLASS-395-900; INT-PATENT-CLASS-G06F-9/44; INT-PATENT-CLASS-G05B-13/00) Avail: US Patent and Trademark Office

This invention relates to a reconfigurable fuzzy cell comprising a digital control programmable gain operation amplifier, an analog-to-digital converter, an electrically erasable PROM, and 8-bit counter and comparator, and supporting logic configured to achieve in real-time fuzzy systems high throughput, grade-of-membership or membership-value conversion of multi-input sensor data. The invention provides a flexible multiplexing-capable configuration, implemented entirely in hardware, for effectuating S-, Z-, and PI-membership functions or combinations thereof, based upon fuzzy logic level-set theory. A membership value table storing 'knowledge data' for each of S-, Z-, and PI-functions is contained within a nonvolatile memory for storing bits of membership and parametric information in a plurality of address spaces. Based upon parametric and control signals, analog sensor data is digitized and converted into grade-of-membership data. In situ learn and recognition modes of operation are also provided.

Official Gazette of the U.S. Patent and Trademark Office



62
COMPUTER SYSTEMS

Includes computer networks and special application computer systems.

N94-17328*# National Aeronautics and Space Administration. Pasadena Office, CA.

NON-BLOCKING CROSSBAR PERMUTATION ENGINE WITH CONSTANT ROUTING LATENCY Patent Application

STEVE P. MONACOS, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 18 Aug. 1993 60 p (Contract NAS7-918)

(NASA-CASE-NPO-18864-1-CU; NAS 1.71:NPO- 18864-1-CU; US-PATENT-APPL-SN-111318) Avail: CASI HC A04/MF A01

The invention is embodied in an N x N crossbar for routing packets from a set of N input ports to a set of N output ports, each packet having a header identifying one of the output ports as its destination, including a plurality of individual links which carry individual packets. Each link has a link input end and a link output end, a plurality of switches. Each of the switches has at least top and bottom switch inputs connected to a corresponding pair of the link output ends and top and bottom switch outputs connected to a corresponding pair of link input ends, whereby each switch is connected to four different links. Each of the switches has an exchange state which routes packets from the top and bottom switch inputs to the bottom and top switch outputs, respectively, and a bypass state which routes packets from the top and bottom switch inputs to the top and bottom switch outputs, respectively. A plurality of individual controller devices governing respective switches for sensing from a header of a packet at each switch input for the identity of the destination output port of the packet and selecting one of the exchange and bypass states in accordance with the identity of the destination output port and with the location of the corresponding switch relative to the destination output port.

NASA

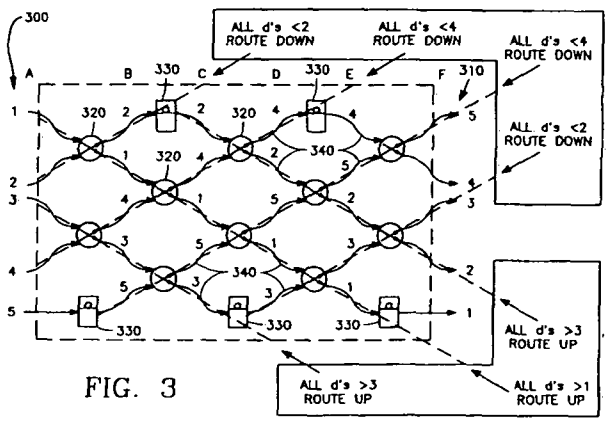


FIG. 3

N94-17330*# National Aeronautics and Space Administration. Pasadena Office, CA.

A SCALABLE WRAP-AROUND SHUFFLE EXCHANGE NETWORK WITH DEFLECTION ROUTING Patent Application

STEVE P. MONACOS, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 18 Aug. 1993 36 p (Contract NAS7-918)

(NASA-CASE-NPO-18983-1-CU; NAS 1.71:NPO- 18983-1-CU; US-PATENT-APPL-SN-112497) Avail: CASI HC A03/MF A01

The invention in one embodiment is a communication network including plural non-blocking crossbar nodes, first apparatus for connecting the nodes in a first layer of connecting links, and second apparatus for connecting the nodes in a second layer of connecting links independent of the first layer, whereby each layer is connected to the other layer at each one of the nodes. Preferably, each one of the layers of connecting links corresponds to one recirculating network topology that closes in on itself.

NASA

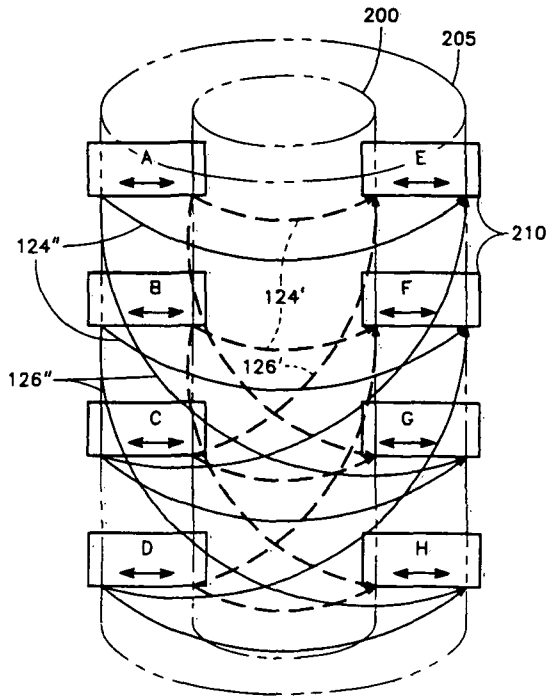


FIG. 2

63
CYBERNETICS

Includes feedback and control theory, artificial intelligence, robotics and expert systems.

N94-15704*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

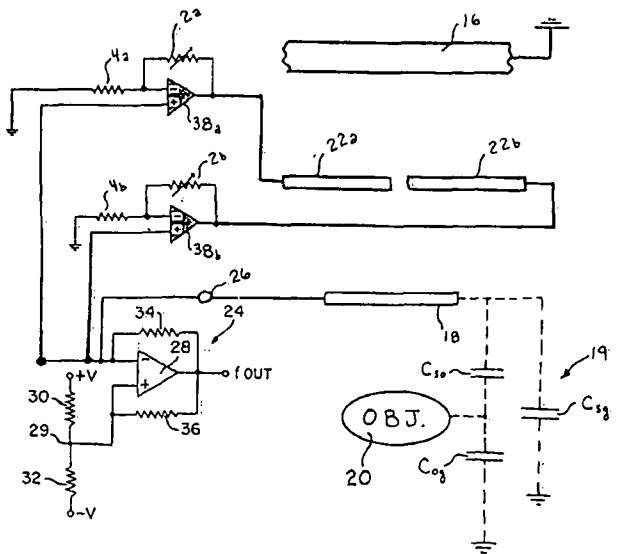
STEERING CAPACIFLECTOR SENSOR Patent Application

DEL T. JENSTROM, inventor (to NASA) and ROBERT L. MCCONNELL, inventor (to NASA) (West Virginia Univ., Morgantown.) 23 Nov. 1992 15 p

(NASA-CASE-GSC-13489-1; NAS 1.71: GSC- 13489-1; US-PATENT-APPL-SN-979987) Avail: CASI HC A03/MF A01

A capacitive type proximity sensor having substantial range and sensitivity between a machine and an intruding object in the immediate vicinity of the machine and having a steerable sensing field has an outer electrical conductor on the machine forming one electrode of a sensor capacitor, the other electrode is the object. The outer conductor is a thin sheet of conductive material with a pair (or more) of intermediate electrical conductors located between the outer conductor and the machine. The pair of intermediate electrical conductors are in close proximity to each other and together form a surface having a size substantially larger than the outer conductor to act as a shield for reducing the parasitic capacitance between the outer conductor and the machine and to steer the sensor field. The pair of intermediate conductors are thin sheets of conductive material substantially wider than the first conductor. The outer and pair of intermediate conductors are attached to a surface on the machine in electrical isolation and with no gaps between the conductors and no gap between the surface and the pair of intermediate conductors. The outer and pair of intermediate conductors are also in conformance with each other and the surface of the machine, and the surface of the machine acts as a ground plane. Variable gain voltage follower circuits are used for coupling, in phase, the instantaneous voltage at the outer electrical conductor to the pair of intermediate electrical conductors and a signal generator is coupled to the outer conductor and is responsive to the capacitance of the sensor capacitor for generating a control signal to the machine.

NASA



N94-15946*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

DOUBLE-DRIVEN SHIELD CAPACITIVE TYPE PROXIMITY SENSOR Patent Application

JOHN M. VRANISH, inventor (to NASA) 25 Jan. 1993 24 p (NASA-CASE-GSC-13541-1; NAS 1.71:GSC-13541-1; US-PATENT-APPL-SN-008426) Avail: CASI HC A03/MF A01

A capacity type proximity sensor comprised of a capacitance type sensor, a capacitance type reference, and two independent and mutually opposing driven shields respectively adjacent to the sensor and reference and which are coupled in an electrical bridge circuit configuration and driven by a single frequency crystal controlled oscillator is presented. The bridge circuit additionally includes a pair of fixed electrical impedance elements which form adjacent arms of the bridge and which comprise either a pair of

precision resistances or capacitors. Detection of bridge unbalance provides an indication of the mutual proximity between an object and the sensor. Drift compensation is also utilized to improve performance and thus increase sensor range and sensitivity.

NASA

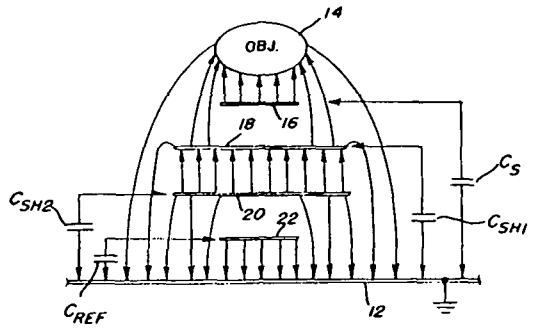


FIG. 2

N94-15958*# National Aeronautics and Space Administration. Pasadena Office, CA.

UNIPOLAR TERMINAL-ATTRACTOR BASED NEURAL ASSOCIATIVE MEMORY WITH ADAPTIVE THRESHOLD Patent Application

HUA-KUANG LIU, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), JACOB BARHEN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), NABIL H. FARHAT, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), and CHWAN-HWA WU, inventor (to NASA) 7 Jun. 1993 66 p

(Contract NAS7-918)

(NASA-CASE-NPO-18790-1-CU;NAS1.71:NPO-18790-1-CU; US-PATENT- APPL- SN-073018) Avail: CASI HC A04/MF A01

A unipolar terminal-attractor based neural associative memory (TABAM) system with adaptive threshold for perfect convergence is presented. By adaptively setting the threshold values for the dynamic iteration for the unipolar binary neuron states with terminal-attractors for the purpose of reducing the spurious states in a Hopfield neural network for associative memory and using the inner product approach, perfect convergence and correct retrieval is achieved. Simulation is completed with a small number of stored states (M) and a small number of neurons (N) but a large M/N ratio. An experiment with optical exclusive-OR logic operation using LCTV SLMs shows the feasibility of optoelectronic implementation of the models. A complete inner-product TABAM is implemented using a PC for calculation of adaptive threshold values to achieve a unipolar TABAM (UIT) in the case where there is no crosstalk, and a crosstalk model (CRIT) in the case where crosstalk corrupts the desired state.

NASA

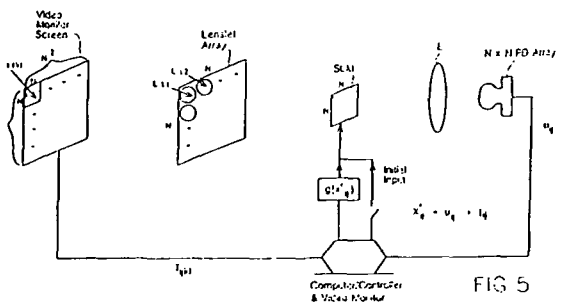


FIG 5

N94-20360* National Aeronautics and Space Administration. Pasadena Office, CA.

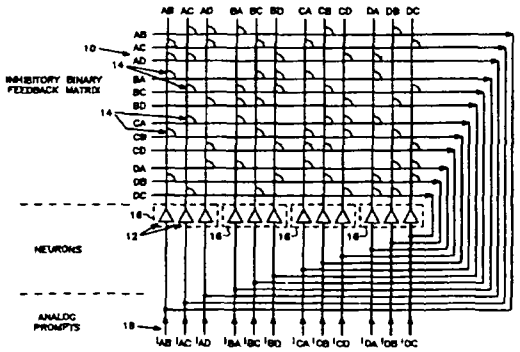
ELECTRONIC NEURAL NETWORK FOR SOLVING TRAVELING SALESMAN AND SIMILAR GLOBAL OPTIMIZATION PROBLEMS Patent

ANILKUMAR P. THAKOOR, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), ALEXANDER W. MOOPENN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), TUAN A. DUONG, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), and SILVIO P. EBERHARDT, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 19 Oct. 1993 15 p Filed 8 Nov. 1991 Supersedes N92-29955 (30 - 20, p 3529) Continuation-in-part of US-Patent-Appl-SN-470664, filed 26 Jan. 1990

(NASA-CASE-NPO-17807-2-CU;US-PATENT-5,255,349; US-PATENT-APPL-SN-789567;US-PATENT-APPL-SN-470664; US-PATENT-CLASS-395-27;US-PATENT-CLASS-395-24; INT-PATENT- CLASS-G06F-15/46; INT-PATENT-CLASS-G06G-7/12) Avail: US Patent and Trademark Office

This invention is a novel high-speed neural network based processor for solving the 'traveling salesman' and other global optimization problems. It comprises a novel hybrid architecture employing a binary synaptic array whose embodiment incorporates the fixed rules of the problem, such as the number of cities to be visited. The array is prompted by analog voltages representing variables such as distances. The processor incorporates two interconnected feedback networks, each of which solves part of the problem independently and simultaneously, yet which exchange information dynamically.

Official Gazette of the U.S. Patent and Trademark Office



N94-20366* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

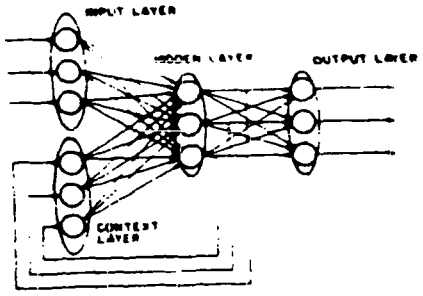
NEURAL NETWORK FOR PROCESSING BOTH SPATIAL AND TEMPORAL DATA WITH TIME BASED BACK-PROPAGATION Patent

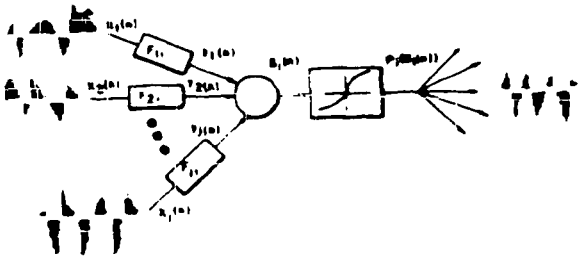
JAMES A. VILLARREAL, inventor (to NASA) and ROBERT O. SHELTON, inventor (to NASA) 12 Oct. 1993 34 p Filed 26 Dec. 1991 Supersedes N92-30314 (30 - 21, p 3700) (NASA-CASE-MSC-21874-1; US-PATENT-5,253,329; US-PATENT-APPL-SN-813556; US-PATENT-CLASS-395-24; US-PATENT-CLASS-395-23; INT-PATENT-CLASS-G06F-15/18) Avail: US Patent and Trademark Office

Neural networks are computing systems modeled after the paradigm of the biological brain. For years, researchers using various forms of neural networks have attempted to model the brain's information processing and decision-making capabilities. Neural network algorithms have impressively demonstrated the capability of modeling spatial information. On the other hand, the

application of parallel distributed models to the processing of temporal data has been severely restricted. The invention introduces a novel technique which adds the dimension of time to the well known back-propagation neural network algorithm. In the space-time neural network disclosed herein, the synaptic weights between two artificial neurons (processing elements) are replaced with an adaptable-adjustable filter. Instead of a single synaptic weight, the invention provides a plurality of weights representing not only association, but also temporal dependencies. In this case, the synaptic weights are the coefficients to the adaptable digital filters. Novelty is believed to lie in the disclosure of a processing element and a network of the processing elements which are capable of processing temporal as well as spacial data.

Official Gazette of the U.S. Patent and Trademark Office





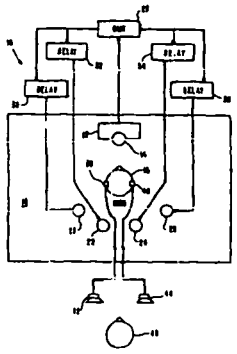
71
ACOUSTICS

Includes sound generation, transmission, and attenuation.

N94-23312* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
HEAD RELATED TRANSFER FUNCTION PSEUDO-STEREOPHONY Patent
DURAND R. BEGAULT, inventor (to NASA) 22 Dec. 1992 10 p Filed 29 Jan. 1992
(NASA-CASE-ARC-11919-1-NP;US-PATENT-5,173,944;US-PATENT-APPL-SN-826749;US-PATENT-CLASS-381-17;US-PATENT-CLASS-381-24;US-PATENT-CLASS-381-26;INT-PATENT-CLASS-H04R-5/00) Avail: US Patent and Trademark Office

An apparatus for producing pseudo-stereophonic sound from a monaural signal is discussed. The apparatus includes a monaural source that has a speaker placed in an anechoic room and has a sound output generated by the monaural signal. The second, third, fourth, and fifth speakers are placed in the anechoic room symmetrically about a listener. The monaural signal from the source is processed to output processed signals to each of the second, third, fourth, and fifth speakers, each speaker producing a sound output corresponding to the received processed signal. A pair of microphones is placed in the ears of the listener for receiving the sound outputs of the first, second, third, fourth, and fifth speakers and producing two differentiated audio channels.

Official Gazette of the U.S. Patent and Trademark Office



72
ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure, electron properties, and molecular spectra.

N94-17329*# National Aeronautics and Space Administration. Pasadena Office, CA.
ELECTRON REVERSAL IONIZER FOR DETECTION OF TRACE SPECIES USING A SPHERICAL CATHODE Patent Application
SAID BOUMSELLEK, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and ARA CHUTJIAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 15 Sep. 1993 27 p
(Contract NAS7-918)
(NASA-CASE-NPO-18870-1-CU; NAS 1.71:NPO-18870-1-CU; US-PATENT- APPL-SN-127653) Avail: CASI HC A03/MF A01

A reversal electron, high-current ionizer capable of focusing a beam of electrons to a reversal region employs an indirectly heated cathode having a concave emitting surface of width of W less than 2r, where r is the radius of curvature and preferably a ratio of width to radius approximately equal to one for optimum high current for a given cathode width.

NASA

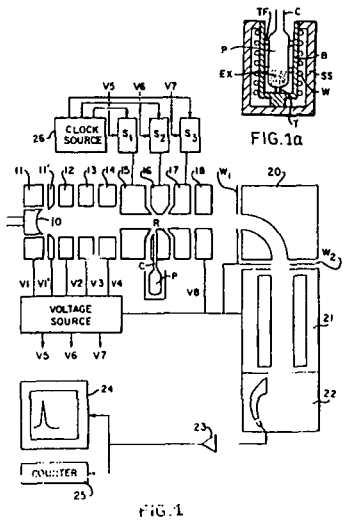


FIG.1a

FIG.1

N94-23825* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

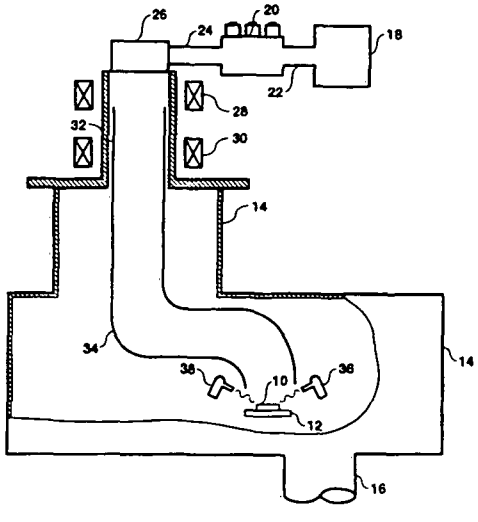
METHOD AND APPARATUS FOR PRODUCING A THERMAL ATOMIC OXYGEN BEAM Patent

BRUCE A. BANKS, inventor (to NASA) and SHARON K. RUTLEDGE, inventor (to NASA) 18 Jan. 1994 6 p Filed 25 Jan. 1993 Supersedes N93-19026 (31 - 6, p 1656)

(NASA-CASE-LEW-15614-1; US-PATENT-5,280,174; US-PATENT-APPL-SN-008026; US-PATENT-CLASS-250-251; INT-PATENT-CLASS-H05H-3/00) Avail: US Patent and Trademark Office

Atomic oxygen atoms are routed to a material through a sufficiently tortuous path so that vacuum ultraviolet radiation is obstructed from arriving at the surface of the material. However, the material surface continues to be exposed to the atomic oxygen.

Official Gazette of the U.S. Patent and Trademark Office



74 OPTICS

Includes light phenomena; and optical devices.

N94-10657* National Aeronautics and Space Administration. Pasadena Office, CA.

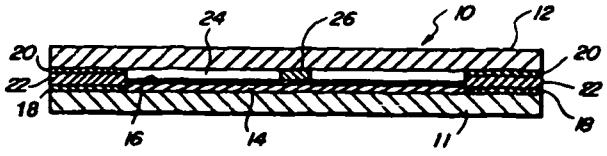
ALKALI METAL FOR ULTRAVIOLET BAND-PASS FILTER Patent

NICK MARDESICH, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), GEORGE A. FRASCHETTI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), TIMOTHY A. MCCANN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), SHERWOOD D. MAYALL, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), DONALD E. DUNN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), and JOHN T. TRAUGER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 17 Aug. 1993 7 p Filed 27 Aug. 1992 Supersedes N92-34241 (30 - 24, p 4257)

(NASA-CASE-NPO-18433-1-CU; US-PATENT-5,237,447; US-PATENT-APPL-SN-936417; US-PATENT-CLASS-359-359; US-PATENT-CLASS-359-360; US-PATENT-CLASS-359-582; US-PATENT-CLASS-359-585; US-PATENT-CLASS-359-892; INT-PATENT-CLASS-G02B-1/10; INT-PATENT-CLASS-G02B-5/20) Avail: US Patent and Trademark Office

An alkali metal filter having a layer of metallic bismuth deposited onto the alkali metal is provided. The metallic bismuth acts to stabilize the surface of the alkali metal to prevent substantial surface migration from occurring on the alkali metal, which may degrade optical characteristics of the filter. To this end, a layer of metallic bismuth is deposited by vapor deposition over the alkali metal to a depth of approximately 5 to 10 A. A complete alkali metal filter is described along with a method for fabricating the alkali metal filter.

Official Gazette of the U.S. Patent and Trademark Office



N94-15933*# National Aeronautics and Space Administration. Pasadena Office, CA.

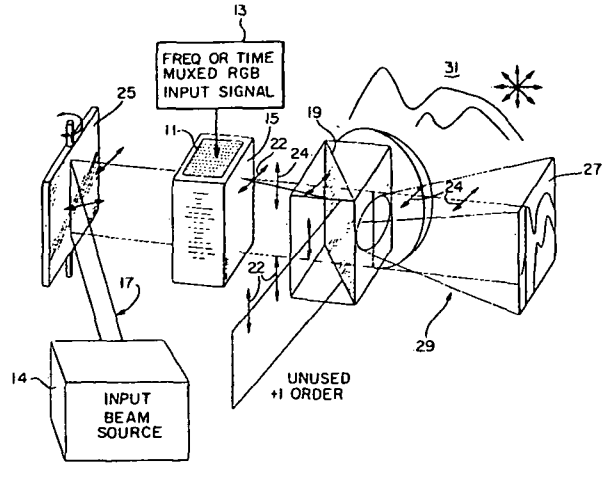
DISPLAY SYSTEM EMPLOYING ACOUSTO-OPTIC TUNABLE FILTER Patent Application

JAMES L. LAMBERT, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 7 Jun. 1993 22 p (Contract NAS7-918)

(NASA-CASE-NPO-18736-1-CU; NAS 1.71:NPO-18736-1-CU; US-PATENT-APPL-SN-073235) Avail: CASI HC A03/MF A01

An acousto-optic tunable filter (AOTF) is employed to generate a display by driving the AOTF with a RF electrical signal comprising modulated red, green, and blue video scan line signals and scanning the AOTF with a linearly polarized, pulsed light beam, resulting in encoding of color video columns (scan lines) of an input video image into vertical columns of the AOTF output beam. The AOTF is illuminated periodically as each acoustically-encoded scan line fills the cell aperture of the AOTF. A polarizing beam splitter removes the unused first order beam component of the AOTF output and, if desired, overlays a real world scene on the output plane. Resolutions as high as 30,000 lines are possible, providing holographic display capability.

NASA



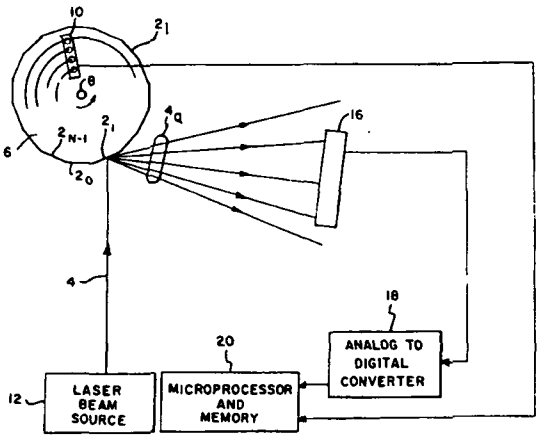
N94-20240* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

ROTARY ENCODING DEVICE USING POLYGONAL MIRROR WITH DIFFRACTION GRATINGS ON EACH FACET Patent

DOUGLAS B. LEVITON, inventor (to NASA) 30 Nov. 1993 13 p Filed 3 Nov. 1992 Supersedes N94-15705 (32 - 3, p 1189) (NASA-CASE-GSC-13543-1; US-PATENT-5,266,796; US-PATENT-APPL-SN-971035; US-PATENT-CLASS-250-231.18; US-PATENT-CLASS-250-237G; INT-PATENT-CLASS-G01D-5/34) Avail: US Patent and Trademark Office

A device for position encoding of a rotating shaft in which a polygonal mirror having a number of facets is mounted to the shaft and a monochromatic light beam is directed towards the facets. The facets of the polygonal mirror each have a low line density diffraction grating to diffract the monochromatic light beam into a number of diffracted light beams such that a number of light spots are created on a linear array detector. An analog-to-digital converter is connected to the linear array detector for reading the position of the spots on the linear array detector means. A microprocessor with memory is connected to the analog-to-digital converter to hold and manipulate the data provided by the analog-to-digital converter on the position of the spots and to compute the position of the shaft based upon the data from the analog-to-digital converter.

Official Gazette of the U.S. Patent and Trademark Office



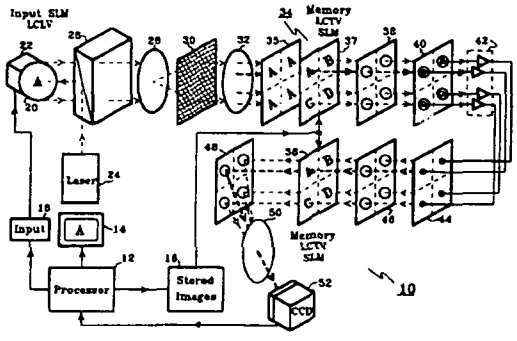
N94-20303* National Aeronautics and Space Administration. Pasadena Office, CA.

OPTOELECTRONIC ASSOCIATIVE MEMORY Patent

TIEN-HSIN CHAO, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 16 Nov. 1993 6 p Filed 19 Aug. 1991 Supersedes N91-32925 (29 - 24, p 4103) (NASA-CASE-NPO-18278-1-CU; US-PATENT-5,262,979; US-PATENT-APPL-SN-747059; US-PATENT-CLASS-365-49; US-PATENT-CLASS-365-215; US-PATENT-CLASS-359-561; US-PATENT-CLASS-382-42; INT-PATENT-CLASS-G11C-15/00) Avail: US Patent and Trademark Office

An associative optical memory including an input spatial light modulator (SLM) in the form of an edge enhanced liquid crystal light valve (LCLV) and a pair of memory SLM's in the form of liquid crystal televisions (LCTV's) forms a matrix array of an input image which is cross correlated with a matrix array of stored images. The correlation product is detected and nonlinearly amplified to illuminate a replica of the stored image array to select the stored image correlating with the input image. The LCLV is edge enhanced by reducing the bias frequency and voltage and rotating its orientation. The edge enhancement and nonlinearity of the photodetection improves the orthogonality of the stored image. The illumination of the replicate stored image provides a clean stored image, uncontaminated by the image comparison process.

Official Gazette of the U.S. Patent and Trademark Office



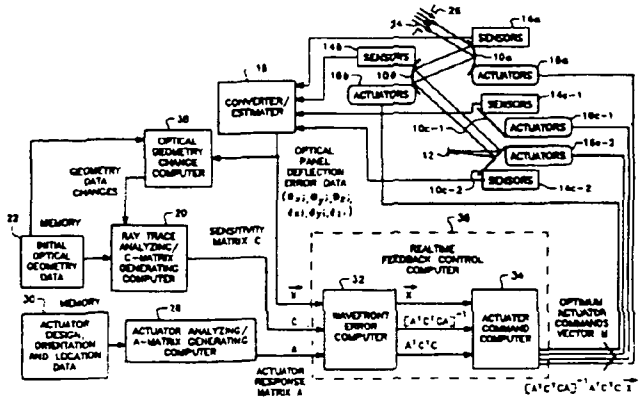
N94-20305* National Aeronautics and Space Administration. Pasadena Office, CA.

FEEDBACK CONTROLLED OPTICS WITH WAVEFRONT COMPENSATION Patent

WILLIAM G. BRECKENRIDGE, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and DAVID C. REDDING, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 23 Nov. 1993 13 p Filed 13 May 1991 Supersedes N91-32924 (29 - 24, p 4103) (NASA-CASE-NPO-18194-1-CU; US-PATENT-5,265,034; US-PATENT-APPL-SN-700379; US-PATENT-CLASS-364-525; US-PATENT-CLASS-364-559; US-PATENT-CLASS-364-148; US-PATENT-CLASS-359-849; US-PATENT-CLASS-250-201.1; US-PATENT-CLASS-250-201.9; INT-PATENT-CLASS-G02B-5/10) Avail: US Patent and Trademark Office

The sensitivity model of a complex optical system obtained by linear ray tracing is used to compute a control gain matrix by imposing the mathematical condition for minimizing the total wavefront error at the optical system's exit pupil. The most recent deformations or error states of the controlled segments or optical surfaces of the system are then assembled as an error vector, and the error vector is transformed by the control gain matrix to produce the exact control variables which will minimize the total wavefront error at the exit pupil of the optical system. These exact control variables are then applied to the actuators controlling the various optical surfaces in the system causing the immediate reduction in total wavefront error observed at the exit pupil of the optical system.

Official Gazette of the U.S. Patent and Trademark Office



N94-20345* National Aeronautics and Space Administration. Pasadena Office, CA.

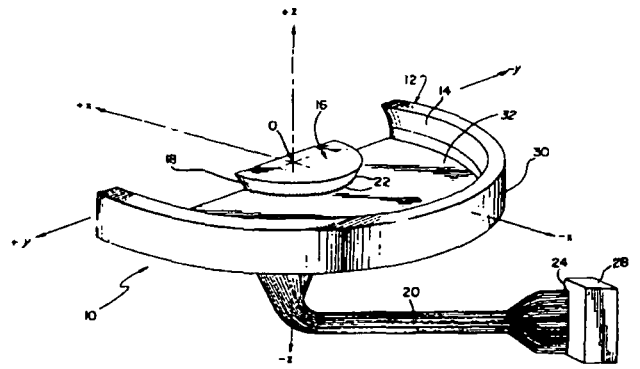
WIDE-ANGLE IMAGING SYSTEM WITH FIBEROPTIC COMPONENTS PROVIDING ANGLE-DEPENDENT VIRTUAL MATERIAL STOPS Patent

ARTHUR H. VAUGHAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 30 Nov. 1993 16 p Filed 1 Nov. 1991 Supersedes N92-17892 (30 - 8, p 1368)

(NASA-CASE-NPO-18146-1-CU;US-PATENT-5,266,795; US-PATENT-APPL-SN-786618;US-PATENT-CLASS-250-227.2; US-PATENT-CLASS-359-896; INT-PATENT-CLASS-H01J-5/16) Avail: US Patent and Trademark Office

A strip imaging wide angle optical system is provided. The optical system is provided with a 'virtual' material stop to avoid aberrational effects inherent in wide angle optical systems. The optical system includes a spherical mirror section for receiving light from a 180 deg strip or arc of a target image. Light received by the spherical mirror section is reflected to a frustoconical mirror section for subsequent rereflection to a row of optical fibers. Each optical fiber transmits a portion of the received light to a detector. The optical system exploits the narrow cone of acceptance associated with optical fibers to substantially eliminate vignetting effects inherent in wide angle systems. Further, the optical system exploits the narrow cone of acceptance of the optical fibers to substantially limit spherical aberration. The optical system is ideally suited for any application wherein a 180 deg strip image need be detected, and is particularly well adapted for use in hostile environments such as in planetary exploration.

Official Gazette of the U.S. Patent and Trademark Office



N94-20378* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

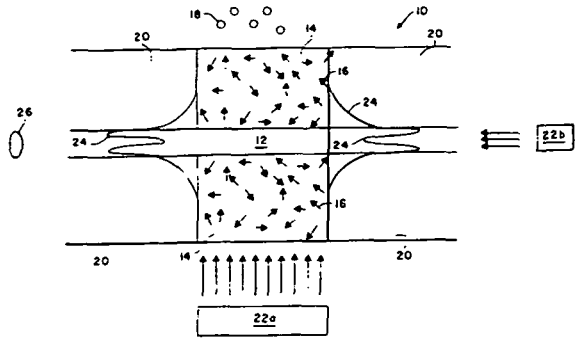
OPTICAL FIBERS AND FLUOROSENSORS HAVING IMPROVED POWER EFFICIENCY AND METHODS OF PRODUCING SAME Patent

CLAUDIO O. EGALON, inventor (to NASA) and ROBERT S. ROGOWSKI, inventor (to NASA) 16 Nov. 1993 8 p Filed 16 Sep. 1991 Supersedes N93-22008 (31 - 7, p 2069)

(NASA- CASE- LAR-14525-1-CU; US-PATENT-5,262,638; US-PATENT- APPL-SN-761198; US-PATENT-CLASS-250-227.14; US-PATENT-CLASS-385-12; INT-PATENT-CLASS-G01N-21/00) Avail: US Patent and Trademark Office

Optical fibers may have applications including fluorosensors which sense the concentration of an analyte. Like communication fibers, these fluorosensors are modeled using a weakly guiding approximation which is only effective when the difference between the respective refractive indices of the fiber core and surrounding cladding are minimal. An optical fiber fluorosensor is provided having a portion of a fiber core which is surrounded by an active cladding which is permeable by the analyte to be sensed and containing substances which emit light waves upon excitation. A remaining portion of the fiber core is surrounded by a guide cladding which guides these light waves to a sensor which detects the intensity of waves, which is a function of the analyte concentration. Contrary to conventional weakly guiding principles, the difference between the respective indices of refraction of the fiber core is surrounded by an active cladding which is thin enough such that its index of refraction is effectively that of the surrounding atmosphere, thereby the atmosphere guides the injective indices of the fiber core and the cladding results in an unexpected increase in the power efficiency of the fiber core.

Official Gazette of the U.S. Patent and Trademark Office



N94-20586* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

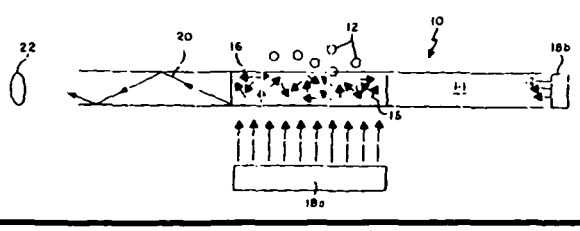
OPTICAL FIBER SENSOR HAVING AN ACTIVE CORE Patent

CLAUDIO OLIVEIRA EGALON, inventor (to NASA) and ROBERT S. ROGOWSKI, inventor (to NASA) 28 Sep. 1993 10 p Filed 18 Mar. 1992 Supersedes N92-30029 (30 - 20, p 3553) Continuation-in-part of US-Patent-Appl-SN-761198, filed 16 Sep. 1991

(NASA-CASE-LAR-14607-1-SB;US-PATENT-5,249,251; US-PATENT-APPL-SN-855363;US-PATENT-APPL-SN-761198; US-PATENT-CLASS-385-123;US-PATENT-CLASS-385-126; US-PATENT-CLASS-385-127;US-PATENT-CLASS-385-128; US-PATENT- CLASS-385-142; US-PATENT-CLASS-372-6) Avail: US Patent and Trademark Office

An optical fiber is provided. The fiber is comprised of an active fiber core which produces waves of light upon excitation. A factor ka is identified and increased until a desired improvement in power efficiency is obtained. The variable a is the radius of the active fiber core and k is defined as 2 pi/lambda wherein lambda is the wavelength of the light produced by the active fiber core. In one embodiment, the factor ka is increased until the power efficiency stabilizes. In addition to a bare fiber core embodiment, a two-stage fluorescent fiber is provided wherein an active cladding surrounds a portion of the active fiber core having an improved ka factor. The power efficiency of the embodiment is further improved by increasing a difference between the respective indices of refraction of the active cladding and the active fiber core.

Official Gazette of the U.S. Patent and Trademark Office



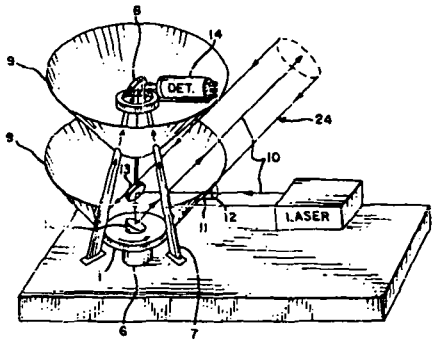
N94-20591* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

CONICALLY SCANNED HOLOGRAPHIC LIDAR TELESCOPE Patent

GEARY SCHWEMMER, inventor (to NASA) 19 Oct. 1993 9 p Filed 10 Mar. 1992 Supersedes N94-17321 (32 - 3, p 1194) (NASA-CASE-GSC-13462-1; US-PATENT-5,255,065; US-PATENT-APPL-SN-848885; US-PATENT-CLASS-356-5; US-PATENT-CLASS-359-17; US-PATENT-CLASS-359-18; INT-PATENT-CLASS-G01C-3/08; INT-PATENT-CLASS-G02B-5/32) Avail: US Patent and Trademark Office

An optical scanning device utilizing a source of optical energy suchas laser light backscattered from the earth's atmosphere or transmitted outward as in a lidar, a rotating holographic optical element having an axis of rotation perpendicular to the plane of its substrate, and having a stationary focus which may or may not be located on its axis of rotation, with the holographic optical element diffracting the source of optical energy at an angle to its rotation axis enabling a conical scanning area and a motor for supporting and rotating the rotating holographic optical element, is described.

Official Gazette of the U.S. Patent and Trademark Office



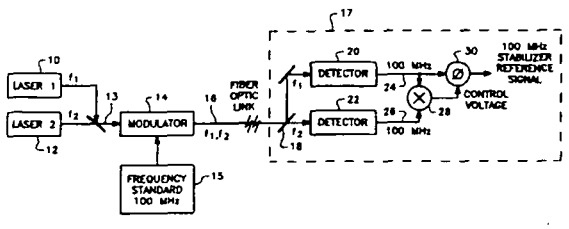
N94-23270* National Aeronautics and Space Administration. Pasadena Office, CA.

DUAL FREQUENCY OPTICAL CARRIER TECHNIQUE FOR TRANSMISSION OF REFERENCE FREQUENCIES IN DISPERSIVE MEDIA Patent

LUTFOLLAH MALEKI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 30 Nov. 1993 7 p Filed 7 Jan. 1993 Continuation of abandoned US-Patent-Appl-SN-703238, filed 20 May 1991 (NASA-CASE-NPO-18007-2-CU;US-PATENT-5,267,072; US-PATENT-APPL-SN-000902;US- PATENT-APPL-SN-703238; US-PATENT-CLASS-359-158;US-PATENT-CLASS-359-154; US-PATENT-CLASS-359-173;US-PATENT-CLASS-359-183; US-PATENT-CLASS-359-189;INT-PATENT- CLASS-H04B-10/00) Avail: US Patent and Trademark Office

Two different carrier frequencies modulated by a reference frequency are transmitted to each receiver to be synchronized therewith. Each receiver responds to local phase differences between the two received signals to correct the phase of one of them so as to maintain the corrected signal as a reliable synchronization reference.

Official Gazette of the U.S. Patent and Trademark Office



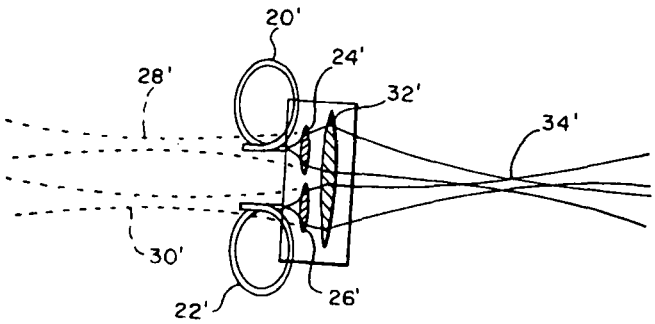
N94-23309* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

OUTPUT OPTICS FOR LASER VELOCIMETERS Patent

DANA H. LYNCH, inventor (to NASA), WILLIAM D. GUNTER, inventor (to NASA), and KENNETH W. MCALISTER, inventor (to NASA) 23 Nov. 1993 5 p Filed 17 Apr. 1991 (NASA-CASE-ARC-11889-1-SB;US-PATENT-5,264,907; US-PATENT-APPL-SN-691602;US-PATENT-CLASS-356-28.5; US-PATENT-CLASS-359-362; INT-PATENT-CLASS-G01P-3/36) Avail: US Patent and Trademark Office

Space savings are effected in the optical output system of a laser velocimeter. The output system is comprised of pairs of optical fibers having output ends from which a beam of laser light emerges, a transfer lens for each light beam, and at least one final (LV) lens for receiving the light passing through the transfer lenses and for focussing that light at a common crossing point or area. In order to closely couple the transfer lenses to the final lens, each transfer lens is positioned relative to the final lens receiving light therefrom such that the output waist of the corresponding beam received by the final lens from the transfer lens is a virtual waist located before the transfer lens.

Official Gazette of the U.S. Patent and Trademark Office



75
PLASMA PHYSICS

Includes magnetohydrodynamics and plasma fusion.

N94-20491* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

METHOD FOR ANISOTROPIC ETCHING IN THE MANUFACTURE OF SEMICONDUCTOR DEVICES Patent

STEVEN L. KOONTZ, inventor (to NASA) and JON B. CROSS, inventor (to NASA) 21 Dec. 1993 11 p Filed 12 Jul. 1991 Supersedes N91-32947 (29 - 24, p 4106) (NASA-CASE-MSC-21631-1;US-PATENT-5,271,800;US-PATENT-APPL-SN-729107;US-PATENT-CLASS-156-643;US-PATENT-CLASS-156-646;US-PATENT-CLASS-156-668;US-PATENT-CLASS-156-662;US-PATENT-CLASS-250-251;US-PATENT-CLASS-250-423R;US-PATENT-CLASS-250-423P) Avail: US Patent and Trademark Office

Hydrocarbon polymer coatings used in microelectronic manufacturing processes are anisotropically etched by hyperthermal atomic oxygen beams (translational energies of 0.2 to 20 eV, preferably 1 to 10 eV). Etching with hyperthermal oxygen atom species obtains highly anisotropic etching with sharp boundaries between etched and mask protected areas.

Official Gazette of the U.S. Patent and Trademark Office

76
SOLID-STATE PHYSICS

Includes superconductivity.

N94-17327*# National Aeronautics and Space Administration. Pasadena Office, CA.

BURIED POROUS SILICON-GERMANIUM LAYERS IN MONOCRYSTALLINE SILICON LATTICES AND METHOD OF PRODUCING Patent Application

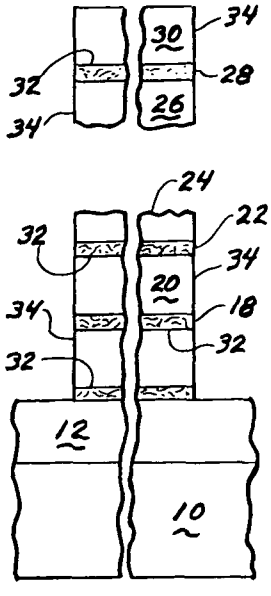
ROBERT W. FATHAUER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and THOMAS GEORGE, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 11 Aug. 1993 23 p

(Contract NAS7-918)

(NASA-CASE-NPO-18836-1-CU; NAS 1.71:NPO-18836-1-CU; US-PATENT-APPL-SN-105728) Avail: CASI HC A03/MF A01

Lattices of alternating layers of monocrystalline silicon and porous silicon-germanium have been produced. These single crystal lattices have been fabricated by epitaxial growth of Si and Si-Ge layers followed by patterning into mesa structures. The mesa structures are stain etched resulting in porosification of the Si-Ge layers with a minor amount of porosification of the monocrystalline Si layers. Thicker Si-Ge layers produced in a similar manner emitted visible light at room temperature.

NASA



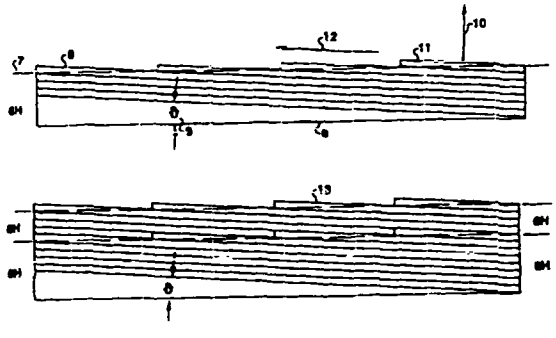
N94-20381* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

PROCESS FOR THE HOMOEPITAXIAL GROWTH OF SINGLE-CRYSTAL SILICON CARBIDE FILMS ON SILICON CARBIDE WAFERS Patent

J. ANTHONY POWELL, inventor (to NASA) 28 Sep. 1993 7 p Filed 12 Jun. 1991 Supersedes N91-26967 (29 - 18, p 3070) (NASA-CASE-LEW-15223-1; US-PATENT-5,248,385; US-PATENT-APPL-SN-718314; US-PATENT-CLASS-156-645; US-PATENT-CLASS-148-33; US-PATENT-CLASS-148-DIG.148; US-PATENT-CLASS-156-646; US-PATENT-CLASS-156-662; US-PATENT-CLASS-156-612; US-PATENT-CLASS-156-DIG.64) Avail: US Patent and Trademark Office

The invention is a method for growing homoepitaxial films of SiC on low tilt angle vicinal (0001) SiC wafers. The invention proposes and teaches a new theoretical model for the homoepitaxial growth of SiC films on (0001) SiC substrates. The inventive method consists of preparing the growth surface of SiC wafers slightly off-axis (from less the 0.1 to 6 deg) from the (0001) plane, subjecting the growth surface to a suitable etch, and then growing the homoepitaxial film using conventional SiC growth techniques.

Official Gazette of the U.S. Patent and Trademark Office



N94-20528* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

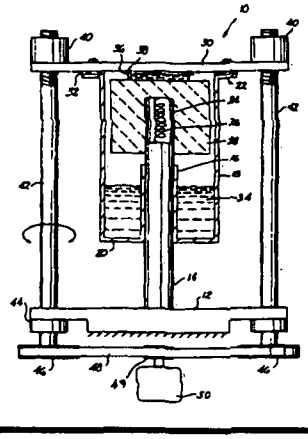
METHOD FOR CONTROLLING PROTEIN CRYSTALLIZATION Patent

DAVID A. NOEVER, inventor (to NASA) 26 Oct. 1993 4 p Filed 28 Aug. 1992 Supersedes N93-17043 (31 - 5, p 1323)

(NASA-CASE-MFS-28688-1; US-PATENT-5,256,241; US-PATENT-APPL-SN-936376; US-PATENT-CLASS-156-600; US-PATENT-CLASS-156-621; US-PATENT-CLASS-156-622; US-PATENT-CLASS-422-245; US-PATENT-CLASS-23-295R; INT-PATENT-CLASS-C30B-7/02) Avail: US Patent and Trademark Office

A method and apparatus for controlling the crystallization of protein by solvent evaporation including placing a drop of protein solution between and in contact with a pair of parallel plates and driving one of the plates toward and away from the other plate in a controlled manner to adjust the spacing between the plates is presented. The drop of solution forms a liquid cylinder having a height dependent upon the plate spacing thereby effecting the surface area available for solvent evaporation. When the spacing is close, evaporation is slow. Evaporation is increased by increasing the spacing between the plates until the breaking point of the liquid cylinder. One plate is mounted upon a fixed post while the other plate is carried by a receptacle movable relative to the post and driven by a belt driven screw drive. The temperature and humidity of the drop of protein solution are controlled by sealing the drop within the receptacle and mounting a heater and dessicant within the receptacle.

Official Gazette of the U.S. Patent and Trademark Office



N94-23972* National Aeronautics and Space Administration. Pasadena Office, CA.

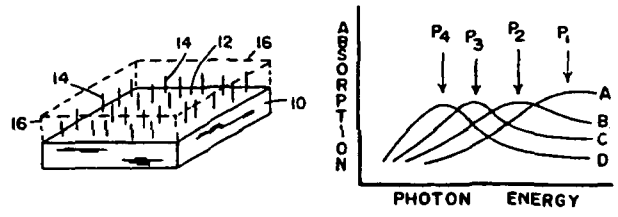
METHOD OF FORMING SILICON STRUCTURES WITH SELECTABLE OPTICAL CHARACTERISTICS Patent

ROBERT W. FATHAUER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and LEO SCHOWALTER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 28 Dec. 1993 5 p Filed 10 Jul. 1992 Supersedes N92-30102 (30 - 20, p 3559)

(NASA-CASE-NPO-18625-1-CU; US-PATENT-5,273,617; US-PATENT-APPL-SN-912961; US-PATENT-CLASS-156-613; US-PATENT-CLASS-437-105; US-PATENT-CLASS-437-200; INT-PATENT-CLASS-C30B-23/02) Avail: US Patent and Trademark Office

Silicon and metal are coevaporated onto a silicon substrate in a molecular beam epitaxy system with a larger than stoichiometric amount of silicon so as to epitaxially grow particles of metal silicide embedded in a matrix of single crystal epitaxially grown silicon. The particles interact with incident photons by resonant optical absorption at the surface plasmon resonance frequency. Controlling the substrate temperature and deposition rate and time allows the aspect ratio of the particles to be tailored to desired wavelength photons and polarizations. The plasmon energy may decay as excited charge carriers or phonons, either of which can be monitored to indicate the amount of incident radiation at the selected frequency and polarization.

Official Gazette of the U.S. Patent and Trademark Office



89
ASTRONOMY

Includes radio, gamma-ray, and infrared astronomy; and astrometry.

N94-17438*# National Aeronautics and Space Administration. Pasadena Office, CA.

WIDE ANGLE, SINGLE SCREEN, GRIDDED SQUARE-LOOP FREQUENCY SELECTIVE SURFACE FOR DIPLEXING TWO CLOSELY SEPARATED FREQUENCY BANDS Patent Application

TE-KAO WU, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 15 Jul. 1993 26 p

(Contract NAS7-918)

(NASA-CASE-NPO-18664-1-CU; NAS 1.71:NPO-18664-1-CU; US-PATENT-APPL-SN-094331) Avail: CASI HC A03/MF A01

The design and performance of a wide angle, single screen, frequency selective surface (FSS) with gridded square-loop path elements are described for diplexing closely separated signal bands, for example, X- and Ku-band signals in an Orbiting Very Long Baseline Interferometer (OVLBI) earth station reflector antenna system, as well as other applications such as military and commercial communications via satellites. Excellent agreement is obtained between the predicted and measured results of this FSS design using the gridded square-loop patch elements sandwiched between 0.0889 cm thick tetrafluoroethylene fluorocarbon polymer (PTFE) slabs. Resonant frequency drift is reduced by 1 GHz with an incident angle from n degrees normal to 40 degrees from normal.

NASA

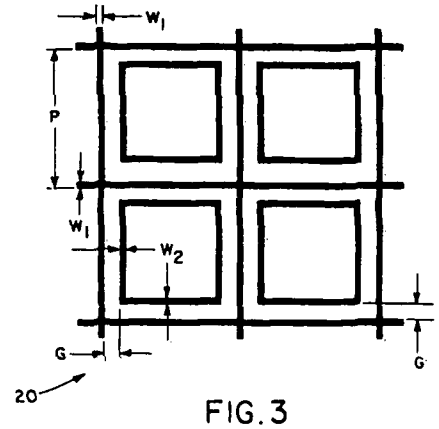


FIG. 3

PUBLIC AVAILABILITY OF COPIES OF PATENTS AND PATENT APPLICATIONS

Copies of U.S. patents may be purchased directly from the U.S. Patent and Trademark Office, Washington, D.C. 20231 at $1.50 per copy. When ordering patents, the U.S. Patent Number should be used, and payment must be remitted in advance, preferably by money order or check payable to the Commissioner of Patents and Trademarks. Prepaid purchase coupons for ordering are also available from the Patent and Trademark Office.

NASA *patent application specifications* are sold in paper copy and microfiche by the NASA Center for AeroSpace Information (CASI). The N accession number should be used in ordering either paper copy or microfiche from CASI.

LICENSES FOR COMMERCIAL USE: INQUIRIES AND APPLICATIONS FOR LICENSE

NASA inventions, abstracted in *NASA PAB,* are available for nonexclusive or exclusive licensing in accordance the NASA Patent Licensing Regulations. It is significant that all licenses for NASA inventions shall be by express written instruments and that no license will be granted or implied in a NASA invention except as provided in the NASA Patent Licensing Regulations.

Inquiries concerning the NASA Patent Licensing Program or the availability of licenses for the commercial use of NASA-owned inventions covered by U.S. patents or pending applications for patent should be forwarded to the NASA Patent Counsel of the NASA installation having cognizance of the specific invention, or the Associate General Counsel for Intellectual Property, code GP, National Aeronautics and Space Administration, Washington, D.C. 20546. Inquiries should refer to the NASA Case Number, the Title of the Invention, and the U.S. Patent Number or the U.S. Application Serial Number assigned to the invention as shown in *NASA PAB.*

The NASA Patent Counsel having cognizance of the invention is determined by the first three letters or prefix of the NASA Case Number assigned to the invention. The addresses of NASA Patent Counsels are listed alongside the NASA Case Number prefix letters in the following table.

STANDING ORDER SUBSCRIPTIONS

NASA SP-7039, Section 1 and its supplements are available from the NASA Center for AeroSpace Information on standing order subscription. Standing order subscriptions do not terminate at the end of a year, as do regular subscriptions, but continue indefinitely unless specifically terminated by the subscriber.

PATENT LICENSING REGULATIONS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
14 CFR Part 1245
Patents and Other Intellectual Property Rights

AGENCY: National Aeronautics and Space Administration (NASA).

ACTION: Final Rule.

SUMMARY: 14 CFR part 1245, subpart 2, "Licensing of NASA Inventions" provides policies and procedures applicable to the licensing of federally owned inventions in the custody of the National Aeronautics and Space Administration and implements Public Law 96-517. The object of subpart 2 is to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

EFFECTIVE DATE: *December 13, 1990.*

ADDRESS: Office of General Counsel, Code GP, NASA Headquarters, Washington, DC 20546.

FOR FURTHER INFORMATION CONTACT:
Harry Lupuloff, (202) 358-2041

SUPPLEMENTARY INFORMATION:
14 CFR part 1245, subpart 2 is amended by revising NASA position titles in §1245.208 (a), (b) and (c). Since this action is internal and administrative in *nature and does not affect the existing regulations, notice and public* comment are not required.

The National Aeronautics and Space Administration has determined that: (1) This rule is not subject to the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601-612, since it will not exert a significant impact on a substantial number of small business entities.

(2) This rule is not a major rule as defined in Executive Order 12291.

List of Subjects in 14 CFR Part 1245

Administrative practice and procedure. Authority delegations (Government agencies). Inventions and patents.

For reasons set out in the Preamble, 14 CFR part 1245 is amended as *follows:*

PART 1245—PATENTS AND OTHER INTELLECTUAL PROPERTY RIGHTS

(1) The authority citation for 14 CFR part 1245, subpart 2 continues to read as follows:

Authority: 35 U.S.C. Section 207 and 208.94 Stat. 3023 and 3024.

(2) Section 1245.208 is revised to read as follows:

★ ★ ★ ★ ★

Subpart 2—Licensing of NASA Inventions

Sec.
1245.200 Scope of subpart.
1245.201 Policy and objective.
1245.202 *Definitions.*
1245.203 Authority to grant licenses.

Restrictions and Conditions

1245.204 All licenses granted under this subpart.

Types of Licenses

1245.205 Nonexclusive licenses.
1245.206 Exclusive and partially exclusive licenses.

Procedures

1245.207 Application for a license.
1245.208 Processing applications.
1245.209 Notice to Attorney General.
1245.210 Modification and termination of licenses.
1245.211 Appeals.
1245.212 *Protection and administration of inventions.*
1245.213 Transfer of custody.
1245.214 Confidentiality of information.

Authority: 35 U.S.C. Section 207 and 208.94 Stat. 3023 and 3024.

★ ★ ★ ★ ★

Subpart 2—Licensing of NASA Inventions

§1245.200 Scope of subpart.

This subpart prescribes the terms, conditions and procedures upon which a NASA invention may be licensed. It does not affect licenses which (a) were in effect prior to July 1, 1981; (b) may exist at the time of the Government's acquisition of title to the invention, including those resulting from the allocation of rights to inventions made under Government research and development contracts; (c) are the result of an authorized exchange of rights in the settlement of patent disputes; or (d) are otherwise authorized by law or treaty.

§1245.201 Policy and objective.

It is the policy and objective of this subpart to use the patent system to promote *the utilization of inventions arising from NASA supported research and develop*ment.

§1245.202 Definitions.

(a) "Federally owned invention" means an invention, plant, or design which is covered by a patent, or patent application in the United States, or a patent, patent application, plant variety protection, or other form of protection, in a foreign country, title to which has been assigned to or otherwise vested in the United States Government.

(b) "Federal agency" means an executive department, military department, Government corporation, or independent establishment, except the Tennessee Valley Authority, which has custody of a Federally owned invention.

(c) "NASA Invention" means a Federally owned invention with respect to which NASA maintains custody and administration, in whole or in part, of the right, title or interest in such invention on behalf of the United States Government.

(d) "Small business firm" means a small business concern as defined at section 2 of Pub. L. 85-536 (15 U. S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of these regulations, *the size standard for small business concerns involved in Government* procurement, contained in 13 CFR 121.3-8, and in subcontracting, contained in 13 CFR 121.3-12, will be used.

(e) "Practical application" means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions, as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

(f) "United States" means the United States of America, its territories and possessions, the District of Columbia, and the Commonwealth of Puerto Rico.

§1245.203 Authority to grant licenses.

NASA inventions shall be made available for licensing as deemed appropriate in the public interest. NASA may grant nonexclusive, partially exclusive, or exclusive licenses thereto under this subpart on inventions in its custody.

Restrictions and Conditions

§1245.204 All licenses granted under this subpart.

(a) *Restrictions.* (1) A license may be granted only if the applicant has supplied NASA with a satisfactory plan for development or marketing of the invention, or both, and with information about the applicant's capability to fulfill the plan.

(2) A license granting rights to use or sell under a NASA invention in the United *States shall normally be granted only to a licensee who agrees that any* products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

(b) *Conditions.* Licenses shall contain such terms and conditions as NASA determines are appropriate for the protection of the interests of the Federal Government and the public and are not in conflict with law or this subpart. The following terms and conditions apply to any license:

(1) The duration of the license shall be for a period specified in the license *agreement, unless sooner terminated in accordance with this subpart.*

(2) The license may be granted for all or less than all fields of use of the invention or in specified geographical areas, or both.

(3) The license may extend to subsidiaries of the licensee or other parties if provided for in the license but shall be nonassignable without approval of NASA, except to the successor of that part of the licensee's business to which the invention pertains.

(4) The license may provide the licensee the right to grant sublicenses under the license, subject to the approval of NASA. Each sublicense shall make reference to the license, including the rights retained by the Government, and a copy of such sublicense shall be furnished to NASA.

(5) The license shall require the licensee to carry out the plan for development or marketing of the invention, or both, to bring the invention to practical application within a period specified in the license, and to continue to make the benefits of the invention reasonably accessible to the public.

(6) The license shall require the licensee to report periodically on the utilization or efforts at obtaining utilization that are being made by the licensee, with particular reference to the plan submitted.

(7) All licenses shall normally require royalties or other consideration.

(8) Where an agreement is obtained pursuant to §1245.204(a)(2) that any products embodying the invention or produced through use of the invention will be manufactured substantially in the United States, the license shall recite such agreement.

(9) The license shall provide for the right of NASA to terminate the license, in whole or in part, if:

(i) NASA determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of NASA that it has taken or can be expected to take within a reasonable time effective steps to achieve practical application of the invention;

(ii) NASA determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee;

(iii) The licensee has willfully made a false statement of or willfully omitted a material fact in the license application or in any report required by the license agreement; or

(iv) The licensee commits a substantial breach of a covenant or agreement contained in the license.

(10) The license may be modified or terminated, consistent with this subpart, upon mutual agreement of NASA and the licensee.

(11) Nothing relating to the grant of a license, nor the grant itself, shall be construed to confer upon any person any immunity from or defenses under the antitrust laws or from a charge of patent misuse, and the acquisition and use of rights pursuant to this subpart shall not be immunized from the operation of state or Federal law by reason of the source of the grant.

Types of Licenses

§1245.205 Nonexclusive licenses.

(a) *Availability of licenses.* Nonexclusive licenses may be granted under NASA inventions without publication of availability or notice of a prospective license.

(b) *Conditions.* In addition to the provisions of §1245.204, the nonexclusive license may also provide that, after termination of a period specified in the license agreement, NASA may restrict the license to the fields of use or geographic areas, or both, in which the licensee has brought the invention to practical application and continues to make the benefits of the invention reasonably accessible to the public. However, such restriction shall be made only in order to grant an exclusive or partially exclusive license in accordance with this subpart.

§1245.206 Exclusive and partially exclusive licenses.

(a) Domestic licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on NASA inventions: (i) 3 months after notice of the invention's availability has been announced in the **Federal Register**; or (ii) without such notice where NASA determines that expeditious granting of such a license will best serve the interests of the Federal Government and the public; and (iii) in either situation, specified in (a)(1)(i) or (ii) of this section only if:

(A) Notice of a prospective license, identifying the invention and the prospective licensee, has been published in the **Federal Register**, providing opportunity for filing written objections within a 60-day period;

(B) After expiration of the period in §1245.206(a)(1)(iii)(A) and consideration of any written objections received during the period, NASA has determined that:

(1) The interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

(2) The desired practical application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention;

(3) Exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

(4) The proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public;

(C) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws; and

(D) NASA has given first preference to any small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and as equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

(2) *Conditions.* In addition to the provisions of §1245.204, the following terms and conditions apply to domestic exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall reserve to NASA the right to require the licensee to grant sublicenses to responsible applicants, on reasonable terms, when necessary to fulfill health or safety needs.

(iii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iv) The license may grant the licensee the right of enforcement of the licensed patent pursuant to the provisions of Chapter 29 of Title 35, United States Code, or other statutes, as determined appropriate in the public interest.

(b) Foreign licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on a NASA invention covered by a foreign patent, patent application, or other form of protection, provided that:

(i) Notice of a prospective license, identifying the invention and prospective licensee, has been published in the **Federal Register,** providing opportunity for filing written objections within a 60-day period and following consideration of such objections;

(ii) NASA has considered whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced; and

(iii) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

(2) *Conditions.* In addition to the provisions of §1245.204, the following terms and conditions apply to foreign exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iii) The license may grant the licensee the right to take any suitable and necessary actions to protect the licensed property, on behalf of the Federal Government.

(c) *Record of determinations.* NASA shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Procedures

§1245.207 Application for a license.

An application for a license should be addressed to the Patent Counsel at the NASA installation having responsibility for the invention and shall normally include:

(a) Identification of the invention for which the license is desired, including the patent application, serial number or patent number, title, and date, if known;

(b) Identification of the type of license for which the application is submitted;

(c) Name and address of the person, company, or organization applying for the license and the citizenship or place of incorporation of the applicant;

(d) Name, address, and telephone number of representative of applicant to whom correspondence should be sent;

(e) Nature and type of applicant's business, identifying products or services which the applicant has successfully commercialized, and approximate number of applicant's employees;

(f) Source of information concerning the availability of a license on the invention;

(g) A statement indicating whether applicant is a small business firm as defined in §1245.202(c);

(h) A detailed description of applicant's plan for development or marketing of the invention, or both, which should include:

(1) A statement of the time, nature and amount of anticipated investment of capital and other resources which applicant believes will be required to bring the invention to practical application;

(2) A statement as to applicant's capability and intention to fulfill the plan, including information regarding manufacturing, marketing, financial, and technical resources;

(3) A statement of the fields of use for which applicant intends to practice the invention; and

(4) A statement of the geographic areas in which applicant intends to manufacture any products embodying the invention and geographic areas where applicant intends to use or sell the invention, or both;

(i) Identification of licenses previously granted to applicant under Federally owned inventions;

(j) A statement containing applicant's best knowledge of the extent to which the invention is being practiced by private industry or Government, or both, or is otherwise available commercially; and

(k) Any other information which applicant believes will support a determination to grant the license to applicant.

§1245.208 Processing applications.

(a) Applications for licenses will be initially reviewed by the Patent Counsel of the NASA installation having responsibility for the invention. The Patent Counsel shall make a preliminary recommendation to the Director of Licensing, NASA Headquarters, whether to:

(1) Grant the license as requested.

(2) Grant the license with modification after negotiation with the licensee, or

(3) Deny the license.

The Director of Licensing shall review the preliminary recommendation of the Patent Counsel and make a final recommendation to the NASA Associate General Counsel (Intellectual Property). Such review and final recommendation may include, and be based on, any additional information obtained from applicant and other sources that the Patent Counsel and the Director of Licensing deem relevant to the license requested. The determination to grant or deny the license shall be made by the Associate General Counsel (Intellectual Property) based on the final recommendation of the Director of Licensing.

(b) When notice of a prospective exclusive or partially exclusive license is published in the **Federal Register** in accordance with §1245.206(a)(1)(iii)(A) or §1245.206(b)(1)(i), any written objections received in response thereto will be considered by the Director of Licensing in making the final recommendation to the Associate General Counsel (Intellectual Property).

(c) If the requested license, including any negotiated modifications, is denied by the Associate General Counsel (Intellectual Property), the applicant may request reconsideration by filing a written request for reconsideration within 30 days after receiving notice of denial. This 30-day period may be extended for good cause.

(d) In addition to, or in lieu of requesting reconsideration, the applicant may also appeal the denial of the license in accordance with §1245.211.

Dated: November 23,1990

Richard H. Truly,
Administrator.

[FR Doc. 90-29084 Filed 12-12-90, 8:45 am]

BILLING CODE 7510-01-M

§1245.209 Notice to Attorney General.

A copy of the notice provided for in §§1245.206(a)(1)(iii)(A), and 1245.206(b)(1)(i) will be sent to the Attorney General.

§1245.210 Modification and termination of licenses.

Before modifying or terminating a license, other than by mutual agreement, NASA shall furnish the licensee and any sublicensee of record a written notice of intention to modify or terminate the license, and the licensee and any sublicensee shall be allowed 30 days after such notice to remedy any breach of the license or show cause why the license should not be modified or terminated.

§1245.211 Appeals.

(a) The following parties may appeal to the NASA Administrator or designee any decision or determination concerning the grant, denial, interpretation, modification, or termination of a license:

(1) A person whose application for a license has been denied;

(2) A licensee whose license has been modified or terminated, in whole or in part; or

(3) A person who timely filed a written objection in response to the notice required by §§1245.206(a)(1)(iii)(A) or 1245.206(b)(1)(i) and who can demonstrate to the satisfaction of NASA that such person may be damaged by the Agency action.

(b) Written notice of appeal must be filed within 30 days (or such other time as may be authorized for good cause shown) after receiving notice of the adverse decision or determination; including, an adverse decision following the request for reconsideration under §1245.208(c). The notice of appeal, along with all supporting documentation should be addressed to the Administrator, National Aeronautics and Space Administration, Washington, DC 20546. Should the appeal raise a genuine dispute over material facts, fact-finding will be conducted by the NASA Inventions and Contributions Board. The person filing the appeal shall be afforded an opportunity to be heard and to offer evidence in support of the appeal. The Chairperson of the Inventions and Contributions Board shall prepare written findings of fact and transmit them to the Administrator or designee. The decision on the appeal shall be made by the NASA Administrator or designee. There is no further right of administrative appeal from the decision of the Administrator or designee.

§1245.212 Protection and administration of inventions.

NASA may take any suitable and necessary steps to protect and administer rights to NASA inventions, either directly or through contract.

§1245.213 Transfer of custody.

NASA having custody of certain Federally owned inventions may transfer custody and administration in whole or in part, to another Federal agency, of the right, title, or interest in any such invention.

§1245.214 Confidentiality of information.

Title 35, United States Code, section 209, provides that any plan submitted pursuant to §1245.207(h) and any report required by §1245.204(b)(6) may be treated by NASA as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of Title 5 of the United States Code.

James M. Beggs,
Administrator.

October 15, 1981.

[FR Doc. R1-31609 Filed 10-30-81, 8:45 am]

BILLING CODE 7510-01-M

NASA Case Number Prefix Letters	Address of Cognizant NASA Patent Counsel
ARC-xxxxx XAR-xxxxx	Ames Research Center Mail Code: 200-11A Moffett Field, California 94035 Telephone: (415) 694-5104
ERC-xxxxx XER-xxxxx HQN-xxxxx XHQ-xxxxx	NASA Headquarters Mail Code: GP Washington, DC 20546 Telephone: (202) 358-2066
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301) 286-7351
KSC-xxxxx XKS-xxxxx	John F. Kennedy Space Center Mail Code: PT-PAT Kennedy Space Center, Florida 32899 Telephone: (305) 867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code: 279 Hampton, Virginia 23365 Telephone: (804) 865-3725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code: 500-318 21000 Brookpark Road Cleveland, Ohio 44135 Telephone: (216) 433-5753
MSC-xxxxx XMS-xxxxx	Lyndon B. Johnson Space Center Mail Code: AL3 Houston, Texas 77058 Telephone: (713) 483-4871
MFS-xxxxx XMF-xxxxx	George C. Marshall Space Flight Center Mail Code: CC01 Huntsville, Alabama 35812 Telephone: (205) 544-0024
NPO-xxxxx XNP-xxxxx FRC-xxxxx XFR-xxxxx WOO-xxxxx	NASA Resident Legal Office Mail Code: 180-801 4800 Oak Grove Drive Pasadena, California 91103 Telephone: (818) 354-2700

REPORT DOCUMENTATION PAGE

1. Report No. NASA SP-7039 (45)	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle NASA Patent Abstracts Bibliography A Continuing Bibliography Section 1: Abstracts (Supplement 45)		5. Report Date July 1994 6. Performing Organization Code. JTT
7. Author(s)		8. Performing Organization Report No.
9. Performing Organization Name and Address NASA Scientific and Technical Information Program		10. Work Unit No. 11. Contract or Grant No.
12. Sponsoring Agency Name and Address National Aeronautics and Space Administr ation Washington, DC 20546-0001		13. Type of Report and Period Covered Special Publication 14. Sponsoring Agency Code
15. Supplementary Notes Section 1: Abstracts		

16. Abstract

Abstracts are provided for 137 patents and patent applications entered into the NASA scientific and technical information system during the period January 1994 through June 1994. Each entry consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or patent application.

17. Key Words (Suggested by Author(s)) Bibliographies Patent Policy NASA Programs	18. Distribution Statement Unclassified - Unlimited Subject Category - 82		
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 58	22. Price * A04/HC

* For sale by the NASA Center for AeroSpace Information, 800 Elkridge Landing Road, Linthicum Heights, MD 21090-2934

ACCESSION NUMBER RANGES

Bibliography Number	*STAR Accession Numbers*
NASA SP-7039 (04) SEC 1	N69-20701 - N73-33931
NASA SP-7039 (12) SEC 1	N74-10001 - N77-34042
NASA SP-7039 (13) SEC 1	N78-10001 - N78-22018
NASA SP-7039 (14) SEC 1	N78-22019 - N78-34034
NASA SP-7039 (15) SEC 1	N79-10001 - N79-21993
NASA SP-7039 (16) SEC 1	N79-21994 - N79-34158
NASA SP-7039 (17) SEC 1	N80-10001 - N80-22254
NASA SP-7039 (18) SEC 1	N80-22255 - N80-34339
NASA SP-7039 (19) SEC 1	N81-10001 - N81-21997
NASA SP-7039 (20) SEC 1	N81-21998 - N81-34139
NASA SP-7039 (21) SEC 1	N82-10001 - N82-22140
NASA SP-7039 (22) SEC 1	N82-22141 - N82-34341
NASA SP-7039 (23) SEC 1	N83-10001 - N83-23266
NASA SP-7039 (24) SEC 1	N83-23267 - N83-37053
NASA SP-7039 (25) SEC 1	N84-10001 - N84-22526
NASA SP-7039 (26) SEC 1	N84-22527 - N84-35284
NASA SP-7039 (27) SEC 1	N85-10001 - N85-22341
NASA SP-7039 (28) SEC 1	N85-22342 - N85-36162
NASA SP-7039 (29) SEC 1	N86-10001 - N86-22536
NASA SP-7039 (30) SEC 1	N86-22537 - N86-33262
NASA SP-7039 (31) SEC 1	N87-10001 - N87-20170
NASA SP-7039 (32) SEC 1	N87-20171 - N87-30248
NASA SP-7039 (33) SEC 1	N88-10001 - N88-20253
NASA SP-7039 (34) SEC 1	N88-20254 - N88-30583
NASA SP-7039 (35) SEC 1	N89-10001 - N89-20085
NASA SP-7039 (36) SEC 1	N89-20086 - N89-30155
NASA SP-7039 (37) SEC 1	N90-10001 - N90-20043
NASA SP-7039 (38) SEC 1	N90-20044 - N90-30170
NASA SP-7039 (39) SEC 1	N91-10001 -N91-21058
NASA SP-7039 (40) SEC 1	N91-21059 - N91-33053
NASA SP-7039 (41) SEC 1	N92-10001 - N92-22095
NASA SP-7039 (42) SEC 1	N92-22096 - N92-34247
NASA SP-7039 (43) SEC 1	N93-10001 - N93-19958
NASA SP-7039 (44) SEC 1	N93-19959 - N93-32425
NASA SP-7039 (45) SEC 1	N94-10001 - N94-25542

POSTMASTER
Address Correction Requested
(Sections 137 and 159 Post Manual)

National Aeronautics and
Space Administration
Code JTT
Washington, DC 20546-0001

Official Business
Penalty for Private Use, $300

SPECIAL FOURTH-CLASS RATE
POSTAGE & FEES PAID
NASA
Permit No. G-27