NASA SP-7039(26)
Section 1
Abstracts

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

JANUARY 1985

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA SP-7039(26)
(Section 1 • Abstracts)
NASA Patent Abstracts Bibliography
JANUARY 1985

ACCESSION NUMBER RANGES

Bibliography Number	*STAR Accession Numbers*
NASA SP-7039(04)	N69-20701 – N73-33931
NASA SP-7039(12)	N74-10001 – N77-34042
NASA SP-7039(13)	N78-10001 – N78-22018
NASA SP-7039(14)	N78-22019 – N78-34034
NASA SP-7039(15)	N79-10001 – N79-21993
NASA SP-7039(16)	N79-21994 – N79-34158
NASA SP-7039(17)	N80-10001 – N80-22254
NASA SP-7039(18)	N80-22255 – N80-34339
NASA SP-7039(19)	N81-10001 – N81-21997
NASA SP-7039(20)	N81-21998 – N81-34139
NASA SP-7039(21)	N82-10001 – N82-22140
NASA SP-7039(22)	N82-22141 – N82-34341
NASA SP-7039(23)	N83-10001 – N83-23266
NASA SP-7039(24)	N83-23267 – N83-37053
NASA SP-7039(25)	N84-10001 – N84-22526
NASA SP-7039(26)	N84-22527 – N84-35284

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NASA SP-7039(26)
Section 1
Abstracts

NASA

PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

Annotated references to NASA-owned inventions covered by U.S. patents and applications for patent that were announced in *Scientific and Technical Aerospace Reports (STAR)* between July 1984 and December 1984.

Scientific and Technical Information Branch 1985
National Aeronautics and Space Administration
Washington, DC

This supplement is available as NTISUB/111/093 from the National Technical Information Service (NTIS), Springfield, Virginia 22161 at the price of $10.00 domestic; $20.00 foreign for standing orders. Please note: Standing orders are subscriptions which do not terminate at the end of a year, as do regular subscriptions, but continue indefinitely unless specifically terminated by the subscriber.

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 172 citations published in this issue of the Abstract Section cover the period July 1984 through December 1984. The Index Section references over 4300 citations covering the period May 1969 through December 1984.

ABSTRACT SECTION (SECTION 1)

This *PAB* issue incorporates the 1975 *STAR* category revisions which include 10 major subdivisions divided into 74 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 new scheme was devised 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 a key illustration taken from the patent or application for patent drawing. Entries are arranged in subject category in order of the ascending NASA Accession Number originally assigned in *STAR* to the invention. The range of NASA Accession Numbers within each issue is printed on the inside front 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 in the citation of the abstract are depicted in the Typical Citation and Abstract reproduced on the following page and are also used in the indexes.

TYPICAL CITATION AND ABSTRACT

NASA SPONSORED DOCUMENT

AVAILABLE ON MICROFICHE

NASA ACCESSION NUMBER

N84-20782*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SOURCE

TITLE

VORTEX GENERATING FLOW PASSAGE DESIGN FOR INCREASED FILM COOLING EFFECTIVENESS Patent Application

INVENTOR

S. S. PAPELL, inventor (to NASA) 15 Feb. 1984 15 p

NASA CASE NUMBER

(NASA-CASE-LEW-14039-1; US-PATENT-APPL-SN-580419)

US PATENT APPLICATIONS SERIAL NUMBER

AVAILABILITY

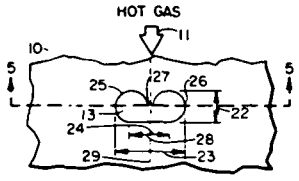
Avail: NTIS HC A02/MF A01 CSCL 20D

COSATI CODE

ABSTRACT

A cooling fluid is injected into a hot flowing gas through a passageway in a wall which contains and is subject to the hot gas. The passageway is slanted in a downstream direction at an acute angle to the wall. A cusp shape is provided in the passageway to generate vortices in the injected cooling fluid thereby reducing the energy extracted from the hot gas for that purpose. The cusp shape increases both film cooling effectiveness and wall area coverage. The cusp may be at either the downstream or upstream side of the passageway, the former substantially eliminating flow separation of the cooling fluid from the wall immediately downstream of the passageway. NASA

KEY ILLUSTRATION



INDEX SECTION (SECTION 2)

The Index Section is divided into five indexes which are cross-indexed and are useful in locating a single invention or groups of inventions.

Each of the five indexes utilizes basic data elements: (1) Subject Category Number, (2) NASA Accession Number, and (3) NASA Case Number, in addition to other specific index terms.

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

Accession Number Index: Lists all inventions in order of ascending NASA 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 when using 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, (i) use the Subject Category Number to locate the Subject Category and (ii) 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 (does not include 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.

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, for fifty cents a 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 by the National Technical Information Service at price code A02 ($7.00 domestic; $14.00 foreign). Microfiche are sold at price code A01 ($4.50 domestic; $9.00 foreign). The US-Patent-Appl-SN-number should be used in ordering either paper copy or microfiche from NTIS.

LICENSES FOR COMMERCIAL USE: INQUIRIES AND APPLICATIONS FOR LICENSE

NASA inventions, abstracted in *NASA PAB,* are available for nonexclusive or exclusive licensing in accordance with 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 Assistant General Counsel for Patent Matters, Code GP-4, 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. Formal application of license must be submitted on the NASA Form, Application for NASA Patent License, which is available upon request from any NASA Patent Counsel.

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC: NASA and NASA-sponsored documents and a large number of aerospace publications are available to the public for reference purposes at the library maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019.

EUROPEAN: An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England for public access. The British Library Lending Division also has available many of the non-NASA publications cited in *Star*. European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols # and * from ESA - Information Retrieval Service European Space Agency, 8-10 rue Mario-Nikis, 75738 Paris CEDEX 15, France.

FEDERAL DEPOSITORY LIBRARY PROGRAM

In order to provide the general public with greater access to U.S. Government publications, Congress established the Federal Depository Library Program under the Government Printing Office (GPO), with 50 regional depositories responsible for permanent retention of material, inter-library loan, and reference services. Over 1,300 other depositories also exist. A list of the regional GPO libraries appears on the inside back cover.

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)965-5104
ERC-xxxxx XER-xxxxx HQN-xxxxx XHQ-xxxxx	NASA Headquarters Mail Code: GP-4 *Washington, D.C. 20546* Telephone: (202)755-3954
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301)344-7351
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)827-8725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code: 500-318 21000 Brookpark Road Cleveland, Ohio 44135 Telephone: (216)433-6346
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)453-0020
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: (213)354-2700

PATENT LICENSING REGULATIONS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

14 CFR Part 1245

Licensing of NASA Inventions

AGENCY: National Aeronautics and Space Administration.

ACTION: Interim regulation with comments requested.

SUMMARY: The National Aeronautics and Space Administration (NASA) is revising its patent licensing regulations to conform with Pub. L. 96-517. This interim regulation provides policies and procedures applicable to the licensing of federally owned inventions in the custody of the National Aeronautics and Space Administration, and implements Pub. L. 96-517. The object of this subpart is to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

EFFECTIVE DATE: July 1, 1981. Comments must be received in writing by December 2, 1981. Unless a notice is published in the **Federal Register** after the comment period indicating changes to be made, this interim regulation shall become a final regulation.

ADDRESS: Mr. John G. Mannix, Director of Patent Licensing, GP-4, NASA, Washington, D.C. 20546.

FOR FURTHER INFORMATION CONTACT:

Mr. John G. Mannix, (202) 755-3954.

SUPPLEMENTARY INFORMATION:

PART 1245—PATENTS AND OTHER INTELLECTUAL PROPERTY RIGHTS

Subpart 2 of Part 1245 is revised to read as follows

* * * * *

Subpart 2—Licensing of NASA Inventions

Sec.

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 development.

§ 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 nay 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 practial 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;

(J) 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 Assistant General Counsel for Patent Matters. 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 Assistant General Counsel for Patent Matters 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 Assistant General Counsel for Patent Matters.

(c) If the requested license, including any negotiated modifications, is denied by the Assistant General Counsel for Patent Matters, 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.

§ 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. 81-31609 Filed 10-30-81; 8:45 am]

BILLING CODE 7510-01-M

FOREIGN PATENT LICENSING REGULATIONS

Selected NASA inventions are also available for licensing in countries other than the United States in accordance with the NASA Foreign Patent Licensing Regulation (14 C.F.R. 1245.4), a copy of which is available from any NASA Patent Counsel. For abstracts of NASA-owned inventions available for licensing in countries other than the United States, see NASA SP-7038, "Significant NASA Inventions Available for Licensing in Countries Other Than the United States." A copy of this NASA publication is available from NASA Headquarters, Code GP, Washington, D.C., 20546.

TABLE OF CONTENTS

Section 1 • Abstracts

AERONAUTICS

Includes aeronautics (general); aerodynamics; air transportation and safety; aircraft communications and navigation; aircraft design, testing and performance; aircraft instrumentation; aircraft propulsion and power; aircraft stability and control; and research and support facilities (air).

For related information see also *Astronautics.*

ASTRONAUTICS

Includes astronautics (general); astrodynamics; ground support systems and facilities (space); launch vehicles and space vehicles; space transportation; spacecraft communications, command and tracking; spacecraft design, testing and performance; spacecraft instrumentation; and spacecraft propulsion and power.

For related information see also *Aeronautics*

CHEMISTRY AND MATERIALS

Includes chemistry and materials (general); composite materials; inorganic and physical chemistry; metallic materials; nonmetallic materials; and propellants and fuels.

ENGINEERING

Includes engineering (general); communications; electronics and electrical engineering; fluid mechanics and heat transfer; instrumentation and photography; lasers and masers; mechanical engineering; quality assurance and reliability; and structural mechanics.
For related information see also *Physics.*

GEOSCIENCES

Includes geosciences (general); earth resources; energy production and conversion; environment pollution; geophysics; meteorology and climatology; and oceanography.
For related information see also *Space Sciences.*

LIFE SCIENCES

Includes sciences (general); aerospace medicine; behavioral sciences; man/system technology and life support; and planetary biology.

MATHEMATICAL AND COMPUTER SCIENCES

Includes mathematical and computer sciences (general); computer operations and hardware; computer programming and software; computer systems; cybernetics; numerical analysis; statistics and probability; systems analysis; and theoretical mathematics.

PHYSICS

Includes physics (general); acoustics; atomic and molecular physics; nuclear and high-energy physics; optics; plasma physics; solid-state physics; and thermodynamics and statistical physics.
For related information see also *Engineering.*

SOCIAL SCIENCES

Includes social sciences (general); administration and management; documentation and information science; economics and cost analysis; law and political science; and urban technology and transportation.

82 DOCUMENTATION AND INFORMATION SCIENCE **N.A.**

Includes information storage and retrieval technology; micrography; and library science.

For computer documentation see *61 Computer Programming and Software.*

83 ECONOMICS AND COST ANALYSIS **N.A.**

Includes cost effectiveness studies.

84 LAW AND POLITICAL SCIENCE **N.A.**

Includes space law; international law; international cooperation; and patent policy.

85 URBAN TECHNOLOGY AND TRANSPORTATION **N.A.**

Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.

For related information see *03 Air Transportation and Safety, 16 Space Transportation,* and *44 Energy Production and Conversion.*

SPACE SCIENCES

Includes space sciences (general); astronomy; astrophysics; lunar and planetary exploration; solar physics; and space radiation.

For related information see also *Geosciences.*

88 SPACE SCIENCES (GENERAL) **N.A.**

89 ASTRONOMY **N.A.**

Includes radio and gamma-ray astronomy; celestial mechanics; and astrometry.

90 ASTROPHYSICS **N.A.**

Includes cosmology; and interstellar and interplanetary gases and dust.

91 LUNAR AND PLANETARY EXPLORATION **N.A.**

Includes planetology; and manned and unmanned flights.

For spacecraft design see *18 Spacecraft Design, Testing and Performance.* For space stations see *15 Launch Vehicles and Space Vehicles.*

92 SOLAR PHYSICS **N.A.**

Includes solar activity, solar flares, solar radiation and sunspots.

93 SPACE RADIATION **N.A.**

Includes cosmic radiation; and inner and outer earth's radiation belts.

For biological effects of radiation see *52 Aerospace Medicine.* For theory see *73 Nuclear and High-Energy Physics.*

GENERAL

99 GENERAL **N.A.**

Note: N.A. means that no abstracts were assigned to this category for this issue.

Section 2 • Indexes

JANUARY 1985 (Supplement 26)

NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

02

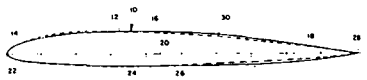
AERODYNAMICS

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

N84-28732* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SHAPES FOR ROTATING AIRFOILS Patent
G. J. BINGHAM, inventor (to NASA) 10 Jul. 1984 12 p Filed 6 Mar. 1979 Supersedes N79-24958 (17 - 16, p 2070)
(NASA-CASE-LAR-12396-1; US-PATENT-4,459,083; US-PATENT-APPL-SN-017889; US-PATENT-CLASS-416-223R; US-PATENT-CLASS-416-242; US-PATENT-CLASS-244-35R)
Avail: US Patent and Trademark Office CSCL 01A

An airfoil which has particular application to the blade or blades of rotor aircraft and aircraft propellers is presented. The airfoil thickness distribution, camber and leading edge radius are shaped to locate the airfoil crest at a more aft position along the chord, and to increase the freestream Mach number at which sonic flow is attained at the airfoil crest. The reduced slope of the airfoil causes a reduction in velocity at the airfoil crest at lift coefficients from zero to the maximum lift coefficient. The leading edge radius is adjusted so that the maximum local Mach number at 1.25 percent chord and at the designed maximum lift coefficient is limited to about 0.48 when the Mach number normal to the leading edge is approximately 0.20. The lower surface leading edge radius is shaped so that the maximum local Mach number at the leading edge is limited to about 0.29 when the Mach number normal to the leading edge is approximately 0.20. The drag divergence Mach number associated with the airfoil is moved to a higher Mach number over a range of lift coefficients resulting in superior aircraft performance.

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



03

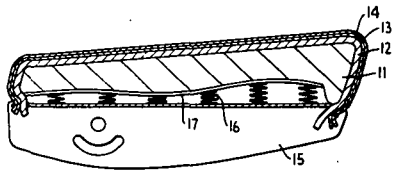
AIR TRANSPORTATION AND SAFETY

Includes passenger and cargo air transport operations; and aircraft accidents.

N84-33394* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FIRE BLOCKING SYSTEMS FOR AIRCRAFT SEAT CUSHIONS Patent
J. A. PARKER and D. A. KOURTIDES, inventors (to NASA) 7 Aug. 1984 9 p Filed 23 Dec. 1982 Supersedes N83-17525 (21 - 08, p 1132)
(NASA-CASE-ARC-11423-1; NAS 1.71:ARC-11423-1; US-PATENT-4,463,465; US-PATENT-APPL-SN-452466; US-PATENT-CLASS-5-459; US-PATENT-CLASS-297-DIG.5; US-PATENT-CLASS-428-71; US-PATENT-CLASS-428-76; US-PATENT-CLASS-428-246; US-PATENT-CLASS-428-280; US-PATENT-CLASS-428-287; US-PATENT-CLASS-428-304.4; US-PATENT-CLASS-428-319.1; US-PATENT-CLASS-428-423.5; US-PATENT-CLASS-428-921) Avail: US Patent and Trademark Office CSCL 01C

A configuration and method for reducing the flammability of bodies of organic materials that thermally decompose to give flammable gases comprises covering the body with a flexible matrix that catalytically cracks the flammable gases to less flammable species. Optionally, the matrix is covered with a gas impermeable outer layer. In a preferred embodiment, the invention takes the form of an aircraft seat in which the body is a poly(urethane) seat cushion, the matrix is an aramid fabric or felt and the outer layer is an aluminum film.

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



04

AIRCRAFT COMMUNICATIONS AND NAVIGATION

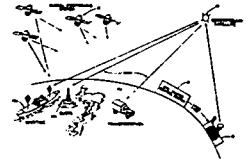
Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

N84-22546* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NAVIGATION SYSTEM AND METHOD Patent
R. E. TAYLOR (Howard Univ., Washington, D.C.) and J. W. SENNOTT, inventors (to NASA) (Howard Univ., Washington, D.C.) 24 Apr. 1984 20 p Filed 22 May 1981 Sponsored by NASA
(NASA-CASE-GSC-12508-1; US-PATENT-4,445,118; US-PATENT-APPL-SN-266253; US-PATENT-CLASS-343-357;

US-PATENT-CLASS-343-356) Avail: US Patent and Trademark Office CSCL 17G

In a global positioning system (GPS), such as the NAVSTAR/GPS system, wherein the position coordinates of user terminals are obtained by processing multiple signals transmitted by a constellation of orbiting satellites, an acquisition-aiding signal generated by an earth-based control station is relayed to user terminals via a geostationary satellite to simplify user equipment. The aiding signal is FSK modulated on a reference channel slightly offset from the standard GPS channel. The aiding signal identifies satellites in view having best geometry and includes Doppler prediction data as well as GPS satellite coordinates and identification data associated with user terminals within an area being served by the control station and relay satellite. The aiding signal significantly reduces user equipment by simplifying spread spectrum signal demodulation and reducing data processing functions previously carried out at the user terminals.

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



N84-27713* National Aeronautics and Space Administration. Pasadena Office, Calif.

LOW-FREQUENCY RADIO NAVIGATION SYSTEM Patent

D. E. WALLIS, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 2 Aug. 1983 13 p Filed 6 Mar. 1981 Supersedes N81-22036 (19 - 13, p 1716) Sponsored by NASA (NASA-CASE-NPO-15264-1; US-PATENT-4,396,918; US-PATENT-APPL-SN-241154; US-PATENT-CLASS-343-105R; US-PATENT-CLASS-364-452) Avail: US Patent and Trademark Office

A method of continuous wave navigation using four transmitters operating at sufficiently low frequencies to assure essentially pure groundwave operation is described. The transmitters are keyed to transmit constant bursts (1/4 sec) in a time-multiplexed pattern with phase modulation of at least one transmitter for identification of the transmitters and with the ability to identify the absolute phase of the modulated transmitter and the ability to modulate low rate data for transmission. The transmitters are optimally positioned to provide groundwave coverage over a service region of about 50 by 50 km for the frequencies selected in the range of 200 to 500 kHz, but their locations are not critical because of the beneficial effect of overdetermination of position of a receiver made possible by the fourth transmitter. Four frequencies are used, at least two of which are selected to provide optimal resolution. All transmitters are synchronized to an average phase as received by a monitor receiver.

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05

AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes aircraft simulation technology.

N84-22551* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SLOTTED VARIABLE CAMBER FLAP Patent

D. G. ANDREWS, inventor (to NASA) (Boeing Commercial Airplane Co., Seattle) 24 Apr. 1984 8 p Filed 30 Oct. 1981 Sponsored by NASA (NASA-CASE-LAR-12541-1; US-PATENT-4,444,368; US-PATENT-APPL-SN-315588; US-PATENT-CLASS-244-216; US-PATENT-CLASS-244-215; US-PATENT-CLASS-244-219; US-PATENT-CLASS-244-212) Avail: US Patent and Trademark Office CSCL 01C

Variable camber actuator assemblies broaden the range of speeds at which lift to drag performance is maximized for slotted flap wings. Lift is improved over a broader range of cruising speeds by varying wing camber with rotational flap movements that do not introduce wing slots and induced drag. Forward flaps are secured to forward flange links which extended from, and are a part of forward flap linkage assemblies. The forward flaps rotate about flap pivots with their rotational displacement controlled by variable camber actuator assemblies located between the forward flaps and the forward flange links. Rear flaps are held relative to the forward flaps by rear flap linkage assemblies which may act independently from the forward flap linkage assemblies and the variable camber actuator assemblies. Wing camber is varied by rotating the flaps with the variable camber actuator assemblies while the flaps are in a deployed or tucked position. Rotating the flaps in a tucked position does not introduce significant wing surface discontinuities, and reduces aircraft fuel consumption on most flight profiles.

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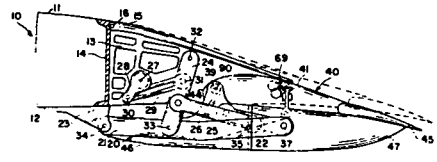
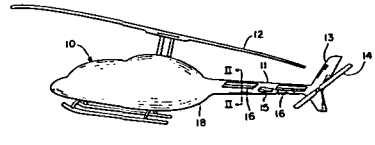


N84-33400*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

HELICOPTER ANTI-TORQUE SYSTEM USING STRAKES Patent Application

H. L. KELLEY (Army Air Mobility Research and Development Lab., Hampton, Va.), J. C. WILSON (Army Air Mobility Research and Development Lab., Hampton, Va.), and A. E. PHELPS, inventors (to NASA) (Army Air Mobility Research and Development Lab., Hampton, Va.) 11 Sep. 1984 12 p Sponsored by NASA (NASA-CASE-LAR-13233-1; NAS 1.71:LAR-13233-1; US-PATENT-APPL-SN-649329) Avail: NTIS HC A02/MF A01 CSCL 01C

A helicopter is disclosed with a system for controlling main-rotor torque which reduces the power and size requirements of conventional anti-torque means. The torque countering forces are generated by disrupting the main rotor downwash flowing around the fuselage. The downwash flow is separated from the fuselage surface by a strake positioned at a specified location on the fuselage. This location is determined by the particular helicopter wash pattern and fuselage configuration, generally being located between 20 deg before top dead center (TDC) and 80 deg from TDC on the fuselage side to which the main rotor blade approaches during rotation. The strake extends along the fuselage from the cabin section to the aft end and can be continuous or separated for aerodynamic surfaces such as a horizontal stabilizer. NASA



06

AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

N84-27733* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HEADS UP DISPLAY Patent
H. D. GARNER and W. E. HOWELL, inventors (to NASA) 5 Jun. 1984 6 p Filed 28 May 1982 Supersedes N82-29319 (20 - 20, p 2789)
(NASA-CASE-LAR-12630-1; US-PATENT-4,453,163; US-PATENT-APPL-SN-383384; US-PATENT-CLASS-340-980; US-PATENT-CLASS-73-178R; US-PATENT-CLASS-340-971; US-PATENT-CLASS-340-975; US-PATENT-CLASS-340-978; US-PATENT-CLASS-340-705) Avail: US Patent and Trademark Office CSCL 01D

A heads up aircraft display which allows the pilot to view the display without diverting his attention from the scene ahead is disclosed. The display is designed for use on propeller driven aircraft comprised of a radially disposed row of lamps embedded in the rear surface of a propeller. Measurements of flight data are made by conventional means and converted into digital signals. These digital signals are applied to graphic generators which control lamp drivers which in turn control lamps through slip rings. The lamps are lit at the appropriate times during each revolution of the propeller to display the flight data in graphic form to the pilot. The combination of graphic generators and radially disposed lamps embedded in an aircraft propeller enables the pilot to view the display without diverting his attention from the scene ahead.

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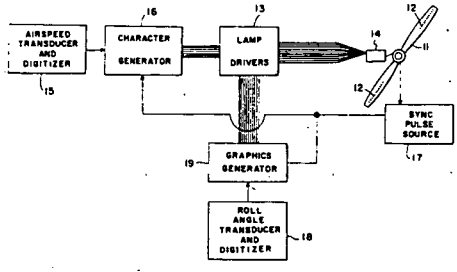
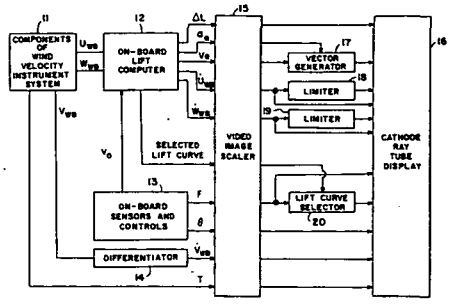


N84-32383*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AIRCRAFT LIFTMETER Patent Application
E. W. MILLEN, inventor (to NASA) 8 Feb. 1984 15 p
(NASA-CASE-LAR-12518-1; NAS 1.71:LAR-12518-1; US-PATENT-APPL-SN-578388) Avail: NTIS HC A02/MF A01 CSCL 01D

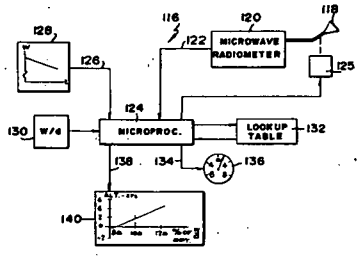
A display for aiding the pilot of an aircraft in anomalous wind environments is described. Wind velocity components are measured by an instrument, processed by a computer and a vector generator and then displayed as a vector. The display utilizes the measurements of ground speed and of wind velocity in three mutually perpendicular directions. This display will also show changes in lift of an aircraft. B.W.



N84-34443* National Aeronautics and Space Administration. Pasadena Office, Calif.
SYSTEM FOR INDICATING FUEL-EFFICIENT AIRCRAFT ALTITUDE Patent
B. L. GARY, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 2 Oct. 1984 8 p Filed 26 Aug. 1982 Supersedes N83-17536 (08 - 21, p 1135) Continuation-in-part of US-Patent-Appl-SN-224231, filed 12 Jan. 1981, US-Patent-4,346,595
(NASA-CASE-NPO-15351-2; US-PATENT-4,474,062; US-PATENT-APPL-SN-412039; US-PATENT-CLASS-73-178-R; US-PATENT-APPL-SN-224231; US-PATENT-4,346,595) Avail: US Patent and Trademark Office CSCL 01D

A method and apparatus are provided for indicating the altitude at which an aircraft should fly so the W/d ratio (weight of the aircraft divided by the density of air) more closely approaches the optimum W/d for the aircraft. A passive microwave radiometer on the aircraft is directed at different angles with respect to the horizon to determine the air temperature, and therefore the density of the air, at different altitudes. The weight of the aircraft is known. The altitude of the aircraft is changed to fly the aircraft at an altitude at which is W/d ratio more closely approaches the optimum W/d ratio for that aircraft.

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



07

AIRCRAFT PROPULSION AND POWER

Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and on-board auxiliary power plants for aircraft.

N84-22559* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

REAL TIME PRESSURE SIGNAL SYSTEM FOR A ROTARY ENGINE Patent
W. J. RICE, inventor (to NASA) 31 Jan. 1984 11 p Filed 19 Feb. 1982
(NASA-CASE-LEW-13622-1; US-PATENT-4,428,226; US-PATENT-APPL-SN-350473; US-PATENT-CLASS-73-115; US-PATENT-CLASS-364-558) Avail: US Patent and Trademark Office CSCL 21A

A real-time IMEP signal which is a composite of those produced in any one chamber of a three-lobed rotary engine is developed by processing the signals of four transducers positioned in a Wankel engine housing such that the rotor overlaps two of the transducers for a brief period during each cycle. During the overlap period of any two transducers, their output is compared and sampled for 10 microseconds per 0.18 degree of rotation by a sampling switch and capacitive circuit. When the switch is closed, the instantaneous difference between the value of the transducer signals is provided while with the switch open the average difference is produced. This combined signal, along with the original signal of the second transducer, is fed through a multiplexer to a pressure output terminal. Timing circuits, controlled by a crank angle encoder on the engine, determine which compared transducer signals are applied to the output terminal and when, as well as the open and closed periods of the switches.

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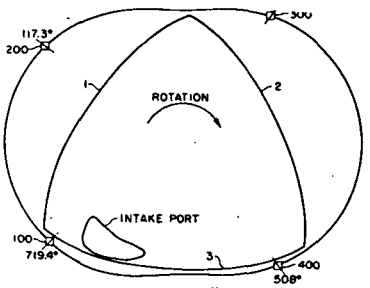

N84-22560* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TIP CAP FOR A ROTOR BLADE
W. K. KOFEL (GE, Cincinnati), E. N. TULEY (GE, Cincinnati), C. H. GAY, JR. (GE, Cincinnati), R. E. TROEGER (GE, Cincinnati), and A. P. STERMAN, inventors (to NASA) (GE, Cincinnati) 25 Oct. 1983 7 p Filed 20 Mar. 1981 Sponsored by NASA
(NASA-CASE-LEW-13654-1; US-PATENT-4,411,597; US-PATENT-APPL-SN-245571; US-PATENT-CLASS-416-92; US-PATENT-CLASS-416-97R; US-PATENT-CLASS-416-224; US-PATENT-CLASS-416-233) Avail: US Patent and Trademark Office CSCL 21E

A replaceable tip cap for attachment to the end of a rotor blade is described. The tip cap includes a plurality of walls defining a compartment which, if desired, can be divided into a plurality of subcompartments. The tip cap can include inlet and outlet holes in walls thereof to permit fluid communication of a cooling fluid there through. Abrasive material can be attached with the radially outer wall of the tip cap.

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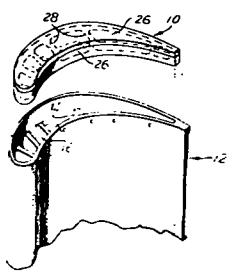
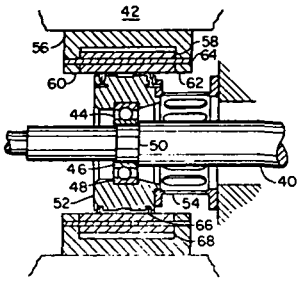


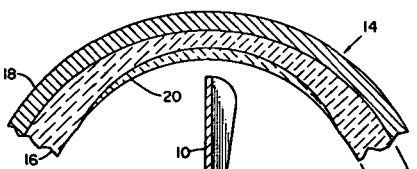
N84-22562*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DUAL CLEARANCE SQUEEZE FILM DAMPER Patent Application
D. P. FLEMING, inventor (to NASA) 5 Apr. 1984 13 p
(NASA-CASE-LEW-13506-1; US-PATENT-APPL-SN-596960)
Avail: NTIS HC A02/MF A01 CSCL 21E

A dual clearance hydrodynamic liquid squeeze film damper for a gas turbine engine is presented. Under normal operating conditions the device functions as a conventional squeeze film damper, using only one of its oil films. When an unbalance reaches abusive levels, as may occur with a blade loss or foreign object damage, a second, larger clearance film becomes active, controlling vibration amplitudes in a near optimum manner until the engine can be safety shut down and repaired. NASA



N84-22563*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OXIDIZING SEAL FOR A TURBINE TIP GAS PATH Patent Application
J. D. CAWLEY, inventor (to NASA) 19 Apr. 1984 12 p
(NASA-CASE-LEW-14053-1; US-PATENT-APPL-SN-602050)
Avail: NTIS HC A02/MF A01 CSCL 21E

The sealing of the gas path in a gas turbine engine at the blade tips is improved by maintaining a minimum clearance between the rotor blade tips and the gas path seal. This is accomplished by taking advantage of an increase in volume during controlled oxidation of certain intermetallic compounds which have high melting points. The increase in volume closes the clearance subsequent to a rub between the blades and the seal. Thus, these compounds re-form the tip seal surface to assure continued engine efficiency. NASA



N84-24577* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMBUSTOR LINER CONSTRUCTION Patent
H. M. CRAIG (United Technologies Corp., East Hartford, Conn.), W. B. WAGNER (United Technologies Corp., East Hartford, Conn.), and W. J. STROCK, inventors (to NASA) (United Technologies Corp., East Hartford, Conn.) 15 Nov. 1983 6 p Filed 2 Apr. 1980 Sponsored by NASA

(NASA-CASE-LEW-14035-1; US-PATENT-4,414,816; US-PATENT-APPL-SN-136652; US-PATENT-CLASS-60-757)
Avail: US Patent and Trademark Office CSCL 21E

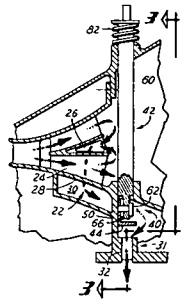
A combustor liner is fabricated from a plurality of individual segments each containing counter/parallel Finwall material and are arranged circumferentially and axially to define the combustion zone. Each segment is supported by a hook and ring construction to an opened lattice frame with sufficient tolerance between the hook and ring to permit thermal expansion with a minimum of induced stresses.

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

N84-33410* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AIR MODULATION APPARATUS Patent
D. T. LENAHAN (GE, Cincinnati), R. J. CORSMEIER (GE, Cincinnati), and A. P. STERMAN, inventors (to NASA) (GE, Cincinnati) 22 Nov. 1983 8 p Filed 25 Feb. 1981 Supersedes N83-30957 (21 - 19, p 3136) Sponsored by NASA
(NASA-CASE-LEW-13524-1; NAS 1.71:LEW-13524-1; US-PATENT-4,416,111; US-PATENT-APPL-SN-238257; US-PATENT-CLASS-60-39.29; US-PATENT-CLASS-60-39.83; US-PATENT-CLASS-415-115) Avail: US Patent and Trademark Office CSCL 20E

An air modulation apparatus, such as for use in modulating cooling air to the turbine section of a gas turbine engine is described. The apparatus includes valve means disposed around an annular conduit, such as a nozzle, in the engine cooling air circuit. The valve means, when in a closed position, blocks a portion of the conduit, and thus reduces the amount and increases the velocity of cooling air flowing through the nozzle. The apparatus also includes actuation means, which can operate in response to predetermined engine conditions, for enabling opening and closing of the valve means.

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 tube facilities; and engine test blocks.

N84-27749* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DIFFUSER/EJECTOR SYSTEM FOR A VERY HIGH VACUUM ENVIRONMENT Patent
K. E. RIGGS (Lockheed Missiles and Space Co., Huntsville, Ala.) and C. J. WOJCIECHOWSKI, inventors (to NASA) (Lockheed Missiles and Space Co., Huntsville, Ala.) 19 Jun. 1984 10 p Filed 19 Aug. 1982 Supersedes N82-33712 (20 - 24, p 3441) Sponsored by NASA
(NASA-CASE-MRS-25791-1; US-PATENT-4,454,753; US-PATENT-APPL-SN-409678; US-PATENT-CLASS-73-117.1; US-PATENT-CLASS-417-159) Avail: US Patent and Trademark Office CSCL 14B

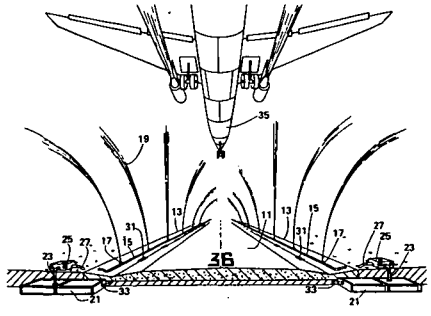
Turbo jet engines are used to furnish the necessary high temperature, high volume, medium pressure gas to provide a high vacuum test environment at comparatively low cost for space engines at sea level. Moreover, the invention provides a unique way by use of the variable area ratio ejectors with a pair of meshing cones are used. The outer cone is arranged to translate fore and aft, and the inner cone is interchangeable with other cones having varying angles of taper.

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

N84-32398*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
WARM FOG DISSIPATION USING LARGE VOLUME WATER SPRAYS Patent Application
V. W. KELLER, inventor (to NASA) 23 Jul. 1984 17 p
(NASA-CASE-MFS-25962-1; NAS 1.71:MFS-25962-1; US-PATENT-APPL-SN-633180) Avail: NTIS HC A02/MF A01 CSCL 01E

This research relates to warm fog dissipation by using large volume water sprays, and to water spray systems for spraying large quantities of water in a specific area to eliminate warm fogs. To accomplish the removal of warm fog about an area such as an airport runway, a plurality of nozzles along a line adjacent the area propells water jets through the fog to heights of approximately twenty-five meters. Each water jet breaks up forming a water drop size distribution that falls through the fog overtaking, colliding, and coalescing with individual fog droplets and thereby removes the fog. A water retrieval system is used to collect the water and return it to reservoirs for pumping it to the nozzles once again.

NASA



N84-34448* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MODEL MOUNT SYSTEM FOR TESTING FLUTTER Patent
M. G. FARMER, inventor (to NASA) 9 Oct. 1984 9 p Filed 31 Mar. 1983 Supersedes N83-25727 (15 - 20, p 2351)
(NASA-CASE-LAR-12950-1; US-PATENT-4,475,385; US-PATENT-APPL-SN-481106; US-PATENT-CLASS-73-147)
Avail: US Patent and Trademark Office CSCL 14B

A wind tunnel model mount system is disclosed for effectively and accurately determining the effects of attack and airstream velocity on a model airfoil or aircraft. The model mount system includes a rigid model attached to a splitter plate which is supported

away from the wind tunnel wall several of flexible rods. Conventional instrumentation is employed to effect model rotation through a turntable and to record model flutter data as a function of the angle of attack versus dynamic pressure.

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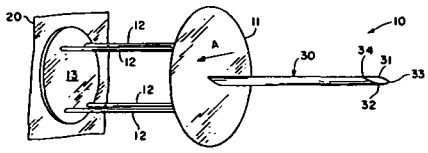


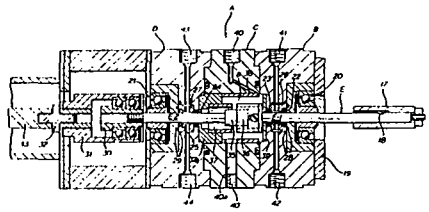
14

GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE)

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

N84-22596*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
DEVICE AND METHOD FOR FRICTIONALLY TESTING MATERIALS FOR IGNITABILITY Patent Application
F. J. BENZ, R. C. SHAW, and D. S. DIXON, inventors (to NASA) (Lockheed Engineering and Management Services Co., Inc.) 17 Jan. 1984 13 p
(NASA-CASE-MSC-20622-1; US-PATENT-APPL-SN-571616)
Avail: NTIS HC A02/MF A01 CSCL 14B

Test apparatus for determining ignition characteristics of various metal in oxidizer environments has a chamber through which the oxidizing agent flows, and means for mounting a stationary test sample therein, a powered, rotating shaft in the chamber rigidly mounts a second test sample. The shaft is axially movable to bring the samples into frictional engagement and heated to the ignition point. Instrumentation connected to the apparatus provides for observation of temperatures, pressures, loads on and speeds of the rotating shaft, and torques whereby components of stressed oxygen systems are selected which avoid accidental fires under working conditions. NASA



16

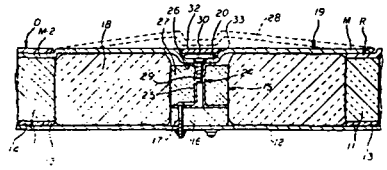
SPACE TRANSPORTATION

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

N84-22601* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
PRE-STRESSED THERMAL PROTECTION SYSTEMS Patent
T. J. DUNN, inventor (to NASA) 3 Apr. 1984 7 p Filed 15 Sep. 1982
(NASA-CASE-MSC-20254-1; US-PATENT-4,439,968; US-PATENT-APPL-SN-418137; US-PATENT-CLASS-52-404; US-PATENT-CLASS-52-506; US-PATENT-CLASS-244-158A)
Avail: US Patent and Trademark Office CSCL 22B

A hexagonal protective and high temperature resistant system for the Space Shuttle Orbiter consists of a multiplicity of pockets formed by hexagonally oriented spacer bars secured on the vehicle substructure. A packing of low density insulating batt material 18 in each pocket, and a thin protective panel of laterally resilient advanced carbon-carbon material surmounting the peripherals bars and packing. Each panel has three stepped or offset lips on contiguous edges. At the center of each pocket is a fully insulated stanchion secured to and connecting the substructure and panel for flexing the panel toward the substructure and thereby prestressing the panel and forcing the panel edges firmly against the spacer bars.

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



N84-27784* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SPACE SHUTTLE WITH RAIL SYSTEM AND AFT THRUST STRUCTURE SECURING SOLID ROCKET BOOSTERS TO EXTERNAL TANK Patent
G. L. VONPRAGENAU, inventor (to NASA) 5 Jun. 1984 11 p Filed 15 Sep. 1982 Supersedes N83-13149 (21 - 04, p 0480)
(NASA-CASE-MFS-25853-1; US-PATENT-4,452,412; US-PATENT-APPL-SN-418138; US-PATENT-CLASS-244-172; US-PATENT-CLASS-244-158R; US-PATENT-CLASS-244-63)
Avail: US Patent and Trademark Office CSCL 22B

The configuration and relationship of the external propellant tank and solid rocket boosters of space transportation systems such as the space shuttle are described. The space shuttle system with the improved propellant tank is shown. The external tank has a forward pressure vessel for liquid hydrogen and an aft pressure vessel for liquid oxygen. The solid rocket boosters are joined together by a thrust frame which extends across and behind the external tank. The thrust of the orbiter's main rocket engines are transmitted to the aft portion of the external tank and the thrust of the solid rocket boosters are transmitted to the aft end of the external tank.

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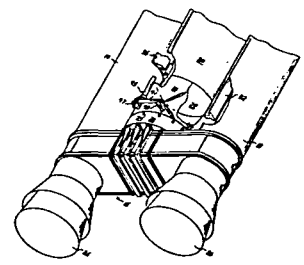


18

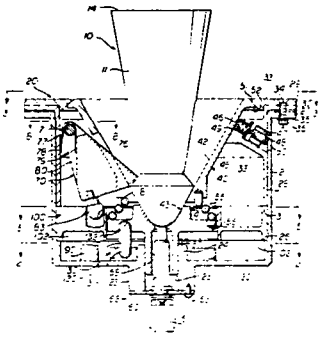
SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes spacecraft thermal and environmental control; and attitude control.

N84-22605* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APPARATUS FOR RELEASABLY CONNECTING FIRST AND SECOND OBJECTS IN PREDETERMINED SPACE RELATIONSHIP Patent
J. A. CHANDLER, inventor (to NASA) 14 Feb. 1984 11 p Filed 14 Apr. 1982
(NASA-CASE-MSC-18969-1; US-PATENT-4,431,333; US-PATENT-APPL-SN-368189; US-PATENT-CLASS-403-322; US-PATENT-CLASS-244-161) Avail: US Patent and Trademark Office CSCL 22B

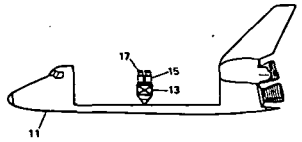
A releasable apparatus that connects first and second space objects, such as a spacecraft and a space vehicle, in predetermined spaced relationship is described. The apparatus comprises at least one probe member mounted on the first object, having an elongated shank portion, the distal end of which is provided with a tapered nose portion. At least one drogue assembly is mounted on the second space object for releasably capturing the probe member upon the first and second objects being brought into close proximity with each other.

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



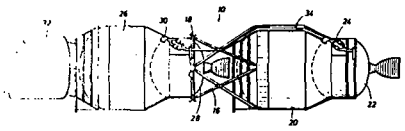
N84-22609*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SPACE PROBE/SATELLITE EJECTION APPARATUS FOR SPACECRAFT Patent Application
H. M. SMYLY, C. D. MILLER, R. A. CLOYD, and C. HELLER, inventors (to NASA) 5 Apr. 1984 18 p
(NASA-CASE-MFS-15429-1; US-PATENT-APPL-SN-596959)
Avail: NTIS HC A02/MF A01 CSCL 22B

An ejection apparatus for spinning and propelling objects for ejection from a spacecraft at a desired velocity and rotational speed is discussed. The apparatus includes a launch cradle on which the space object to be ejected rests. The cradle is rotatably supported by a central hub secured to the upper end of the pneumatic cylinder piston shaft. Release mechanisms consisting of a retractable pin and locking lug is utilized to hold the cradle and object to be ejected. The release mechanism has a fixed barrier member which holds the retractable pin in engagement with the locking lug until release by upward movement of the launch cradle beyond the barrier height. NASA



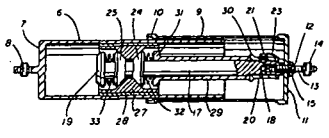
N84-22610*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
TANKER ORBIT TRANSFER VEHICLE AND METHOD Patent Application
G. G. RYAN, inventor (to NASA) 8 Feb. 1983 23 p
(NASA-CASE-MSC-20543-1; US-PATENT-APPL-SN-580574)
Avail: NTIS HC A02/MF A01 CSCL 22B

A method and apparatus for transportation between orbits are presented. A tanker orbit transfer vehicle includes two stages each of which includes a fuel container. The first stage may be left in an intermediate parking orbit while the second stage goes on to carry out a mission, thereafter to return to rendezvous and dock with the first stage. Fuel carried by the first stage may be utilized for travel of the two stages between the starting orbit and the parking orbit, and for return to the starting orbit. An aerobrake may be included in the system for use in the return to the initial orbit. NASA



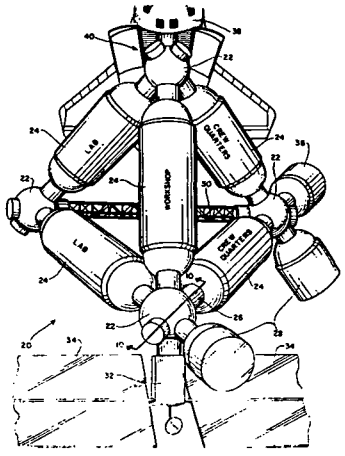
N84-22611*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
CONSTANT FORCE FRICTION DAMPER Patent Application
G. E. CAMPBELL, inventor (to NASA) (Rockwell International Corp., Downey, Calif.) 8 Feb. 1983 9 p Sponsored by NASA
(NASA-CASE-MSC-20505-1; US-PATENT-APPL-SN-519660)
Avail: NTIS HC A02/MF A01 CSCL 22B

A friction type damper unit has opposed conical wedge rings, on a wedge bolt plunger extending axially into a barrel connected to the body of a space vehicle, as in the payload bay of the space shuttle obiter. The plunger is connected to the softly sprung payload, as the inertial upper stage (IUS) in the payload bay of the vehicle. Friction shoes are slideable on the barrel and expandable by the wedge rings. The wedge rings are connected to the plunger through opposed balanced stacks of Belleville washers which provide the required high spring constant and balanced reversing forces. NASA



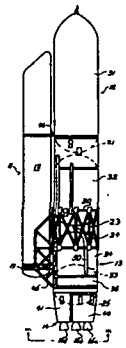
N84-22612*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SPACE STATION ARCHITECTURE, MODULE, BERTHING HUB, SHELL ASSEMBLY, BERTHING MECHANISM AND UTILITY CONNECTION CHANNEL Patent Application
M. M. COHEN, inventor (to NASA) 9 Mar. 1984 25 p
(NASA-CASE-ARC-11505-1; US-PATENT-APPL-SN-588036)
Avail: NTIS HC A02/MF A01 CSCL 22B

The geometric form of a space station is presented that includes a description of a plurality of modules and berthing hubs, joined by interconnections which are sideways connectable. The modules and hubs are fastened together in a triangular configuration in three dimensions. The interconnections include a pair of opposed, axially aligned, flanged ports and a clamp latch formed from a plurality of sections hinged along their length and extending circumferentially around the flanged ports. A hermetic seal is formed between the ports. A utilities connection channel extends between the ports. The channel has a shell with utilities connectors movable between an extended position to mating connectors in the modules and a withdrawn position. Assembly sequence and common module shell structure is detailed. NASA



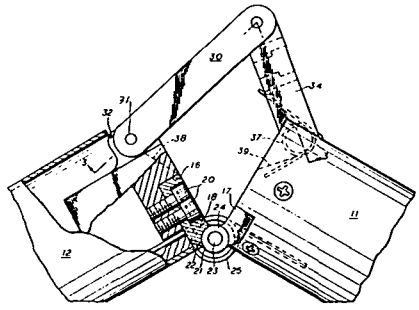
N84-27787* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THREE STAGE ROCKET VEHICLE WITH PARALLEL STAGING Patent
W. R. MARSHALL, inventor (to NASA) 29 May 1984 10 p
Filed 30 Sep. 1982 Supersedes N83-12138 (21 - 03, p 0334)
(NASA-CASE-MFS-25878-1; US-PATENT-4,451,017;
US-PATENT-APPL-SN-431886; US-PATENT-CLASS-244-172;
US-PATENT-CLASS-244-2; US-PATENT-CLASS-244-63) Avail:
US Patent and Trademark Office CSCL 22B

A three stage rocket vehicle has a large forward propellant tank and a small aft propellant tank axially aligned. Secured to the rear end of the aft propellant tank is an engine mount structure carrying rocket engines. Offset and secured to the propellant tanks is a payload structure. The propellants from the large forward tank are fed into the aft propellant tank. This arrangement enables the vehicle to parallel stage its use of engines and components and results in significant payload capability. The design and components fully utilize existing space shuttle elements and tooling. *Official Gazette of the U.S. Patent and Trademark Office*



N84-32424*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
FOLDABLE SELF-ERECTING JOINT Patent Application
T. E. PELISCHEK, inventor (to NASA) 9 Mar. 1984 11 p
(NASA-CASE-MSC-20635-1; NAS 1.71:MSC-20635-1;
US-PATENT-APPL-SN-588039) Avail: NTIS HC A02/MF A01
CSCL 22B

The invention relates to a foldable self erecting joint which may be used to deploy the tetratruss frame of the proposed shuttle launched triangular space station. The frame must be folded into the payload bay of the space shuttle orbiter. To deploy the frame the tubes are automatically unfolded and once in position should remain safely. A pair of hinged, tubular members in which the hinging is located at corresponding portions of the members are used. The opposite edge portions are connected by spring biased toggle links in the unfolded position. The members are nested against one of the members in substantial alignment and overcenter for securely locking the joint in the unfolded position. E.R.



N84-33450* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
CURVED CAP CORRUGATED SHEET Patent
R. C. DAVIS, T. T. BALES, D. M. ROYSTER, and L. R. JACKSON, inventors (to NASA) 18 Sep. 1984 11 p Filed 1 Jul. 1983
Supersedes N83-29446 (21 - 18, p 2908)
(NASA-CASE-LAR-12884-1; NAS 1.71:LAR-12884;
US-PATENT-4,472,473; US-PATENT-APPL-SN-510136;

US-PATENT-CLASS-428-184; US-PATENT-CLASS-52-814; US-PATENT-CLASS-428-182; US-PATENT-CLASS-428-595)
Avail: US Patent and Trademark Office CSCL 22B

The report describes a structure for a strong, lightweight corrugated sheet. The sheet is planar or curved and includes a plurality of corrugation segments, each segment being comprised of a generally U-shaped corrugation with a part-cylindrical crown and cap strip, and straight side walls and with secondary corrugations oriented at right angles to said side walls. The cap strip is bonded to the crown and the longitudinal edge of said cap strip extends beyond edge at the intersection between said crown and said side walls. The high strength relative to weight of the structure makes it desirable for use in aircraft or spacecraft.
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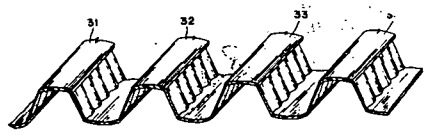


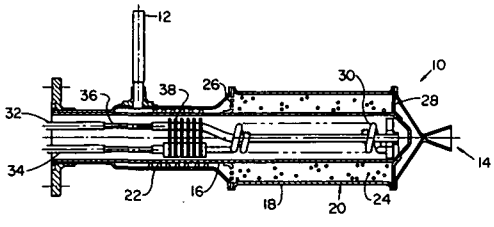
20

SPACECRAFT PROPULSION AND POWER

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

N84-32425*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IMPROVED HEAT EXCHANGER FOR ELECTROTHERMAL DEVICES Patent Application
R. J. ZAVESKY, J. S. SOVEY, M. J. MIRTICH, C. MARINOS, and P. F. PENKO, inventors (to NASA) 31 Jul. 1984 10 p
(NASA-CASE-LEW-14037-1; NAS 1.71:LEW-14037-1; US-PATENT-APPL-SN-636463) Avail: NTIS HC A02/MF A01 CSCL 21C

This research is concerned with improving electrothermal devices. An electrothermal thruster utilizes a generally cylindrical heat exchanger chamber to convert electricity to heat which raises the propellant temperature. A textured, high emissivity heat element radiatively transfers heat to the inner wall of this chamber that is ion beam morphologically controlled for high absorptivity. This, in turn, raises the temperature of a porous heat exchanger material in an annular chamber surrounding the cylindrical chamber. Propellant gas flows through the annular chamber and is heated by the heat exchanger material. B.W.



24

COMPOSITE MATERIALS

Includes laminates.

N84-22695* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DIAMONDLIKE FLAKE COMPOSITES Patent
B. A. BANKS, inventor (to NASA) 20 Mar. 1984 6 p Filed 17 May 1983
(NASA-CASE-LEW-13837-1; US-PATENT-4,437,962; US-PATENT-APPL-SN-495381; US-PATENT-CLASS-204-192C; US-PATENT-CLASS-204-192R; US-PATENT-CLASS-204-192SP; US-PATENT-CLASS-423-414; US-PATENT-CLASS-423-445; US-PATENT-CLASS-423-446; US-PATENT-CLASS-423-449; US-PATENT-CLASS-423-DIG.10) Avail: US Patent and Trademark Office CSCL 11D

A carbon coating is vacuum arc deposited on a smooth surface of a target which is simultaneously ion beam sputtered. The bombarding ions have sufficient energy to create diamond bonds. Spalling occurs as the carbon deposit thickens. The resulting diamond-like carbon flakes are mixed with a binder or matrix material to form a composite material having improved thermal, electrical, mechanical, and tribological properties when used in aerospace structures and components.
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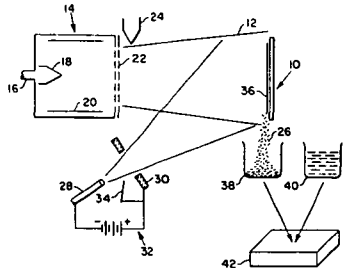
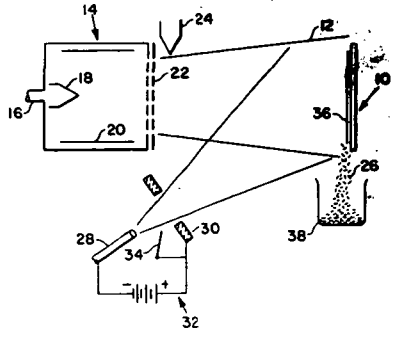


N84-22696*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DIAMONDLIKE FLAKES Patent Application
B. A. BANKS, inventor (to NASA) 19 Mar. 1984 10 p
(NASA-CASE-LEW-13837-2; US-PATENT-APPL-SN-591089)
Avail: NTIS HC A02/MF A01 CSCL 11D

A carbon coating which is vacuum arc deposited on a smooth surface of a target which is simultaneously ion beam sputtered is discussed. The bombarding ions have sufficient energy to create diamond bonds. Spalling occurs as the carbon deposit thickens. The resulting diamondlike carbon flakes have improved thermal, electrical, mechanical, and tribological properties when used in aerospace structures and components. NASA

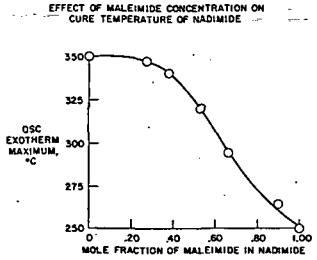


N84-22697*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FIRE AND HEAT RESISTANT LAMINATING RESINS BASED ON MALEIMIDO SUBSTITUTED AROMATIC CYCLOTRIPHOSPHAZENES Patent Application
D. KUMAR (NAS-NRC, Washington, D.C.), G. M. FOHLEN, and J. A. PARKER, inventors (to NASA) 11 Apr. 1984 42 p Previously announced in IAA as A84-16347
(NASA-CASE-ARC-11428-1; US-PATENT-APPL-SN-599126)
Avail: NTIS HC A03/MF A01 CSCL 11D

The 4-Aminophenoxy cyclotriphosphazenes were reacted with maleic anhydride to produce maleamic acids which are converted to the maleimides, then the maleimides are polymerized. By selection of starting materials, hexakis amino or trisaminophenoxy-trisphenoxy-cyclotriphosphazenes), selection of molar proportions of reactants, use of mixtures of anhydrides and use of dianhydrides as bridging groups a variety of maleimides and polymers are produced. The polymers have high limiting oxygen indices, high char yields and other useful heat and fire resistant properties making them useful as impregnants of fabrics. NASA

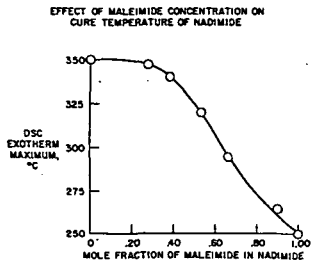
N84-22698*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CHEMICAL APPROACH FOR CONTROLLING NADIMIDE CURE TEMPERATURE AND RATE Patent Application
R. W. LAUVER, inventor (to NASA) 14 Dec. 1983 18 p
(NASA-CASE-LEW-13770-3; US-PATENT-APPL-SN-561431)
Avail: NTIS HC A02/MF A01 CSCL 11D

Polyimide resins suitable for use as composite matrix materials are formed by copolymerization of maleic and norbornenyl end capped monomers and oligomers. The copolymers can be cured at temperatures under about 300 C by controlling the available concentration of the maleic end-capped reactant. This control can be achieved by adding sufficient amounts of said maleic reactant, or by chemical modification of either copolymer, so as to either increase Diels-Alder retrogression of the norbornenyl capped reactant and/or holding initiation and polymerization to a rate compatible with the availability of the maleic-capped reactant. NASA



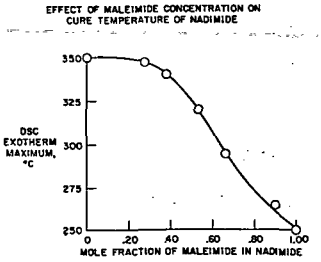
N84-22699*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CHEMICAL APPROACH FOR CONTROLLING NADIMIDE CURE TEMPERATURE AND RATE Patent Application
R. W. LAUVER, inventor (to NASA) 14 Dec. 1983 18 p
(NASA-CASE-LEW-13770-4; US-PATENT-APPL-SN-561429)
Avail: NTIS HC A02/MF A01 CSCL 11D

Polyimide resins suitable for use as composite matrix materials are formed by copolymerization of maleic and norbornenyl endcapped monomers and oligomers. The copolymers can be cured at temperatures under about 300 C by controlling the available concentration of the maleic-capped reactant. This control can be achieved by adding sufficient amounts of said maleic reactant, or by chemical modification of either copolymer, so as to either increase Diels-Alder retrogression of the norbornenyl capped reactant and/or holding initiation and polymerization to a rate compatible with the availability of the maleic-capped reactant. NASA



N84-22700*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CHEMICAL APPROACH FOR CONTROLLING NADIMIDE CURE TEMPERATURE AND RATE Patent Application
R. W. LAUVER, inventor (to NASA) 14 Dec. 1983 18 p
(NASA-CASE-LEW-13770-5; US-PATENT-APPL-SN-561435)
Avail: NTIS HC A02/MF A01 CSCL 11D

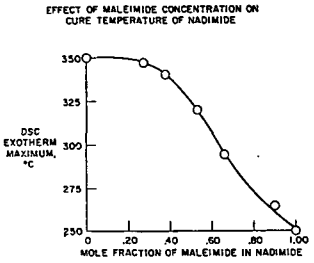
Polyimide resins suitable for use as composite matrix materials are formed by copolymerization of maleic and norbornenyl endcapped monomers and oligomers. The copolymers can be cured at temperatures under about 300 C by controlling the available concentration of the maleic end-capped reactant. This control can be achieved by adding sufficient amounts of said maleic reactant, or by chemical modification of either copolymer, so as to either increase Diels-Alder retrogression of the norbornenyl capped reactant and/or holding initiation and polymerization to a rate compatible with the availability of the maleic-capped reactant. NASA



N84-22701*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CHEMICAL APPROACH FOR CONTROLLING NADIMIDE CURE TEMPERATURE AND RATE Patent Application
R. W. LAUVER, inventor (to NASA) 14 Dec. 1983 18 p
(NASA-CASE-LEW-13770-6; US-PATENT-APPL-SN-561434)
Avail: NTIS HC A02/MF A01 CSCL 11D

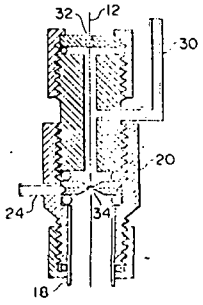
Polyimide resins suitable for use as composite matrix materials are formed by copolymerization of maleic and norbornenyl endcapped monomers and oligomers. The copolymers can be cured at temperatures under about 300 C by controlling the available concentration of the maleic end-capped reactant. This

control can be achieved by adding sufficient amounts of said maleic reactant, or by chemical modification of either copolymer, so as to either increase Diels-Alder retrogression of the norbornenyl capped reactant and/or holding initiation and polymerization to a rate compatible with the availability of the maleic-capped reactant. NASA



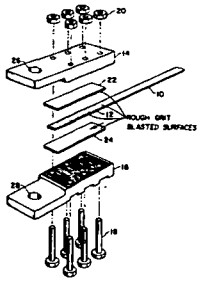
N84-24711*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD FOR STRENGTHENING BORON FIBERS Patent Application
J. A. DICARLO, inventor (to NASA) 10 May 1984 12 p
(NASA-CASE-LEW-13826-2; US-PATENT-APPL-SN-608742)
Avail: NTIS HC A02/MF A01 CSCL 11D

Commercially available boron filters, produced by the chemical vapor deposition of boron onto tungsten wire substrates, are strengthened by treating them in an oxygen plus inert gas (argon) containing atmosphere for a few minutes at about 880 C. High temperature oxidation increases the residual compression on the tungsten core because the fiber contracts axially during formation of a thin boron oxide coating on the fiber surface. This increases the intrinsic strength of the fiber by raising the tensile strength level required for core initiated fracture. After cooling to room temperature, the fibers are chemically polished to reduce their diameters by 0.2 mils to 0.5 mils. The chemical polish removes both original and oxidation induced surface flaws. The strengthened fibers are intended to be utilized as reinforcement in composite materials. Such materials may be boron/aluminum or boron/epoxy. NASA



N84-27829* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD AND APPARATUS FOR GRIPPING UNIAXIAL FIBROUS COMPOSITE MATERIALS Patent
J. D. WHITTENBERGER and F. I. HURWITZ, inventors (to NASA) 5 Jun. 1984 5 p Filed 15 Sep. 1982 Supersedes N83-12176 (21 - 03, p 0339)
(NASA-CASE-LEW-13758-1; US-PATENT-4,452,088; US-PATENT-APPL-SN-418139; US-PATENT-CLASS-73-856; US-PATENT-CLASS-73-833) Avail: US Patent and Trademark Office CSCL 11D

A strip specimen is cut from a unidirectional strong, brittle fiber composite material, and the surfaces of both ends of the specimen are grit blasted. The specimen is then placed between metal load transfer members having grit blasted surfaces. Sufficient compressive stress is applied to the load transfer members to prevent slippage during testing at both elevated temperatures and room temperatures. The need for adhesives, load pads, and other secondary composite processing is eliminated. This gripping system was successful in tensile testing, creep rupture testing, and fatigue testing uniaxial composite materials at 316 C.
Official Gazette of the U.S. Patent and Trademark Office



N84-34571* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PROCESS FOR IMPROVING MECHANICAL PROPERTIES OF EPOXY RESINS BY ADDITION OF COBALT IONS Patent
D. M. STOAKLEY and A. K. ST.CLAIR, inventors (to NASA) 25 Sep. 1984 8 p Filed 03 Nov. 1983 Supersedes N84-20701 (11 - 20, p 1637)
(NASA-CASE-LAR-13230-1; NAS 1.71:LAR-13230-1; US-PATENT-4,473,674; US-PATENT-APPL-SN-548584; US-PATENT-CLASS-523-454; US-PATENT-CLASS-523-458; US-PATENT-CLASS-525-484; US-PATENT-CLASS-528-92; US-PATENT-CLASS-528-407) Avail: US Patent and Trademark Office CSCL 11D

A resin product useful as an adhesive, composite or casting resin is described as well as the process used in its preparation to improve its flexural strength mechanical property characteristics. Improved flexural strength is attained with little or no change in density, thermal stability or moisture resistance by chemically incorporating 1.2% to 10.6% by weight Co(3) ions in an epoxidized resin system.
Official Gazette of the U.S. Patent and Trademark Office

25

INORGANIC AND PHYSICAL CHEMISTRY

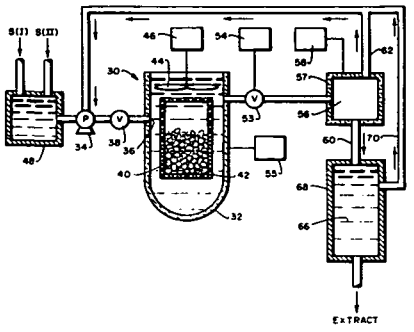
Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

N84-22709* National Aeronautics and Space Administration. Pasadena Office, Calif.
SUPERCRITICAL SOLVENT COAL EXTRACTION Patent

L. E. COMPTON, inventor (to NASA) (California Inst. of Tech., Pasadena) 17 Apr. 1984 7 p Filed 17 Nov. 1981 Sponsored by NASA
(NASA-CASE-NPO-15210-1; US-PATENT-4,443,321; US-PATENT-APPL-SN-322312; US-PATENT-CLASS-208-8LE; US-PATENT-CLASS-208-10) Avail: US Patent and Trademark Office CSCL 07D

Yields of soluble organic extract are increased up to about 50% by the supercritical extraction of particulate coal at a temperature below the polymerization temperature for coal extract fragments (450 C.) and a pressure from 500 psig to 5,000 psig by the conjoint use of a solvent mixture containing a low volatility, high critical temperature coal dissolution catalyst such as phenanthrene and a high volatility, low critical temperature solvent such as toluene.

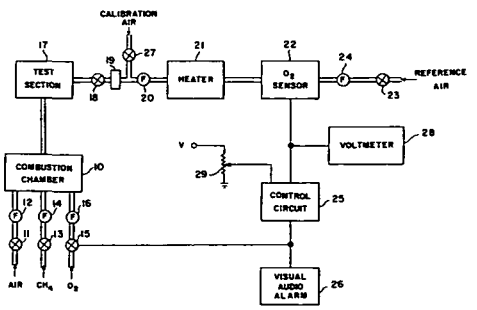
Official Gazette of the U.S. Patent and Trademark Office



N84-32447*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A SYSTEM FOR CONTROLLING THE OXYGEN CONTENT OF A GAS PRODUCED BY COMBUSTION Patent Application
J. J. SINGH, W. T. DAVIS, and R. L. PUSTER, inventors (to NASA) 23 Jul. 1984 10 p
(NASA-CASE-LAR-13257-1; NAS 1.71:LAR-13257-1; US-PATENT-APPL-SN-633178) Avail: NTIS HC A02/MF A01 CSCL 21B

A mixture of air, CH4 and OH(2) is burned in a combustion chamber to produce a product gas in the test section. The OH(2) content of the product gas is compared with the OH(2) content of reference air in an OH(2) sensor. If there is a difference an error signal is produced at the output of a control circuit which by the means of a solenoid valve, regulates the flow of OH(2) into the combustion chamber to make the error signal zero. The product gas in the test section has the same oxygen content as air.

NASA



26

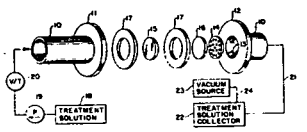
METALLIC MATERIALS

Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

N84-22734* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD OF MAKING A LIGHT WEIGHT BATTERY PLAQUE Patent
M. A. REID, R. E. POST, and D. G. SOLTIS, inventors (to NASA) 27 Mar. 1984 6 p Filed 19 Feb. 1982
(NASA-CASE-LEW-13349-1; US-PATENT-4,439,465; US-PATENT-APPL-SN-350476; US-PATENT-CLASS-427-115; US-PATENT-CLASS-29-623.5; US-PATENT-CLASS-427-125; US-PATENT-CLASS-427-126.6; US-PATENT-CLASS-427-296; US-PATENT-CLASS-427-306; US-PATENT-CLASS-429-223; US-PATENT-CLASS-429-234) Avail: US Patent and Trademark Office CSCL 11F

A nickel plaque which may be coated with a suitable metal or compound to make an electrode for a fuel cell or battery is fabricated by directing nickel sensitizer, catalyst and plating solutions through a porous plastic substrate in the order named and at prescribed temperatures and flow rates. A boride compound dissolved in the plating solution decreases the electrical resistance of the plaque. Certain substrates may require treatment in an alkali solution to dissolve filler materials thereby increasing porosity to a required 65%.

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



N84-27855* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COATING WITH OVERLAY METALLIC-CERMET ALLOY SYSTEMS Patent
M. A. GEDWILL, S. R. LEVINE, and T. K. GLASGOW, inventors (to NASA) 29 May 1984 7 p Filed 7 Jan. 1983 Supersedes N83-17683 (21 - 08, p 1158) Division of US-Patent-Appl-SN-403378, US-Patent-4,446,199, filed 30 Jul. 1982
(NASA-CASE-LEW-13639-2; US-PATENT-4,451,496; US-PATENT-APPL-SN-456460; US-PATENT-CLASS-427-34; US-PATENT-CLASS-427-405; US-PATENT-CLASS-427-419.2; US-PATENT-CLASS-428-632) Avail: US Patent and Trademark Office CSCL 11F

A base layer of an oxide dispersed, metallic alloy (cermet) is arc plasma sprayed onto a substrate, such as a turbine blade, vane, or the like, which is subjected to high temperature use. A top layer of an oxidation, hot corrosion, erosion resistant alloy of nickel, cobalt, or iron is then arc plasma sprayed onto the base layer. A heat treatment is used to improve the bonding. The base layer serves as an inhibitor to interdiffusion between the protective top layer and the substrate. Otherwise, the 10 protective top layer would rapidly interact detrimentally with the substrate and degrade

by spalling of the protective oxides formed on the outer surface at elevated temperatures.

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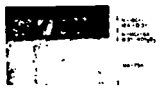

N84-33555* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

OVERLAY METALLIC-CERMET ALLOY COATING SYSTEMS Patent

M. A. GEDWILL, S. R. LEVINE, and T. K. GLASGOW, inventors (to NASA) 1 May 1984 7 p Filed 30 Jul. 1982 Supersedes N82-33522 (20 - 24, p 3413)
(NASA-CASE-LEW-13639-1; NAS 1.71:LEW-13639-1; US-PATENT-4,446,199; US-PATENT-APPL-SN-403378; US-PATENT-CLASS-428-639; US-PATENT-CLASS-428-564; US-PATENT-CLASS-428-678; US-PATENT-CLASS-416-241R)
Avail: US Patent and Trademark Office CSCL 11F

A substrate, such as a turbine blade, vane, or the like, which is subjected to high temperature use is coated with a base coating of an oxide dispersed, metallic alloy (cermet). A top coating of an oxidation, hot corrosion, erosion resistant alloy of nickel, cobalt, or iron is then deposited on the base coating. A heat treatment is used to improve the bonding. The base coating serves as an inhibitor to interdiffusion between the protective top coating and the substrate. Otherwise, the protective top coating would rapidly interact detrimentally with the substrate and degrade by spalling of the protective oxides formed on the outer surface at elevated temperatures.

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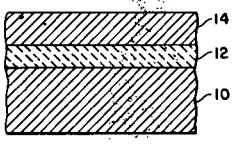

27

NONMETALLIC MATERIALS

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

N84-22744* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PROCESS FOR PREPARING PERFLUOROTRIAZINE ELASTOMERS AND PRECURSORS THEREOF Patent

R. W. ROSSER (San Jose State Univ., Calif.), T. S. CHEN (San Jose State Univ., Calif.), and C. H. CHENG, inventors (to NASA) (San Jose State Univ., Calif.) 28 Feb. 1984 8 p Filed 6 Apr. 1982 Sponsored by NASA
(NASA-CASE-ARC-11402-1; US-PATENT-4,434,106; US-PATENT-APPL-SN-366025; US-PATENT-CLASS-260-465.5R; US-PATENT-CLASS-528-362; US-PATENT-CLASS-528-401; US-PATENT-CLASS-528-422; US-PATENT-CLASS-528-423; US-PATENT-CLASS-544-215; US-PATENT-CLASS-260-465.6; US-PATENT-CLASS-564-243) Avail: US Patent and Trademark Office CSCL 11G

Perfluoroether triazine elastomers having improved properties and utility in seals, gaskets, sealing components and the like are prepared from oligomeric imidoylamidines that have, in turn, been prepared by the process of (1) reacting a perfluorodinitrile with liquid ammonia to yield a perfluorodiamidine, (2) isolating the perfluorodiamidine, (3) reacting the isolated diamidine with a perfluorodinitrile to yield a perfluoror(imidoylamidine) dinitrile, and then repeating step (1), (2), and (3) to sequentially grow an oligomer of desired molecular size. The isolated amidine and nitrile intermediates are also described.

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N84-22745* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PHOSPHORUS-CONTAINING IMIDE RESINS Patent

I. K. VARMA (NAS-NRC, Washington, D.C.), G. M. FOHLEN (NAS-NRC, Washington, D.C.), and J. A. PARKER, inventors (to NASA) (NAS-NRC, Washington, D.C.) 21 Feb. 1984 9 p Filed 11 Jul. 1983 Continuation-in-part of US Patent-4,395,557, US Patent Appl. SN-288267, filed 30 Jul. 1981
(NASA-CASE-ARC-11368-3; US-PATENT-4,433,115; US-PATENT-4,395,557; US-PATENT-APPL-SN-512795; US-PATENT-APPL-SN-288267; US-PATENT-CLASS-525-417; US-PATENT-CLASS-428-370; US-PATENT-CLASS-428-408; US-PATENT-CLASS-428-902; US-PATENT-CLASS-428-920; US-PATENT-CLASS-526-262; US-PATENT-CLASS-528-228; US-PATENT-CLASS-528-322; US-PATENT-CLASS-548-415)
Avail: US Patent and Trademark Office CSCL 11G

Flame-resistant reinforced bodies are disclosed which are composed of reinforcing fibers, filaments or fabrics in a cured body of bis- and tris-imide resins derived from tris(m-aminophenyl) phosphine oxides by reaction with maleic anhydride or its derivatives, or of addition polymers of such imides, including a variant in which a mono-imide is condensed with a dianhydride and the product is treated with a further quantity of maleic anhydride.

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N84-22746* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

THERMOSET-THERMOPLASTIC AROMATIC POLYAMIDE CONTAINING N-PROPARGYL GROUPS Patent

T. L. ST.CLAIR (Virginia Polytechnic Inst. and State Univ., Blacksburg), J. F. WOLFE (Virginia Polytechnic Inst. and State Univ., Blacksburg), and T. D. GREENWOOD, inventors (to NASA) (Virginia Polytechnic Inst. and State Univ., Blacksburg) 14 Feb. 1984 6 p Division of Serial No. 199,768, filed 23 Oct. 1980, US Patent No. 4,395,540 Sponsored by NASA
(NASA-CASE-LAR-12723-2; US-PATENT-4,431,792; US-PATENT-APPL-SN-447371; US-PATENT-CLASS-528-183; US-PATENT-CLASS-525-426; US-PATENT-CLASS-528-220; US-PATENT-CLASS-528-345; US-PATENT-CLASS-528-348; US-PATENT-4,395,540; US-PATENT-APPL-SN-199768) Avail: US Patent and Trademark Office CSCL 11G

The compounds of the class of aromatic polyamides useful as matrix resins in the manufacture of composites or laminate fabrication were developed. The process for preparing this thermoplastic-thermoset polyamide system involves incorporating a latent crosslinking moiety along the backbone of the polyamide to improve the temperature range of fabrication thereof wherein the resin softens at a relatively low temperature (approx. 154 C) and subsequently sets-up or undergoes crosslinking when subjected to higher temperature (approx. 280 C).

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

N84-22747* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ETHYNYL AND SUBSTITUTED ETHYNYL-TERMINATED POLYSULFONES Patent
P. M. HERGENROTHER, inventor (to NASA) 14 Feb. 1984 7 p Filed 8 Oct. 1982
(NASA-CASE-LAR-12931-1; US-PATENT-4,431,761; US-PATENT-APPL-SN-433598; US-PATENT-CLASS-524-171; US-PATENT-CLASS-525-534; US-PATENT-CLASS-525-535; US-PATENT-CLASS-525-536; US-PATENT-CLASS-528-25; US-PATENT-CLASS-528-26) Avail: US Patent and Trademark Office CSCL 11G

Ethynyl and substituted ethynyl-terminated polysulfones and a process for preparing the same are disclosed. These polysulfones are thermally cured to induce cross-linking and chain extension, producing a polymer system with improved solvent resistance and use temperature. Also disclosed are substituted 4-ethynylbenzoyl chlorides as precursors to the substituted ethynyl-terminated polysulfones and a process for preparing the same.

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

N84-22748* National Aeronautics and Space Administration. Pasadena Office, Calif.
ABSORBABLE-SUSCEPTOR JOINING OF CERAMIC SURFACES Patent
J. E. SCHROEDER (California Inst. of Tech., Pasadena) and P. J. SHLICHTA, inventors (to NASA) (California Inst. of Tech., Pasadena) 13 Dec. 1983 10 p Filed 10 Feb. 1983 Sponsored by NASA
(NASA-CASE-NPO-15640-1; US-PATENT-4,420,352; US-PATENT-APPL-SN-465367; US-PATENT-CLASS-156-89; US-PATENT-CLASS-156-304.3; US-PATENT-CLASS-156-304.6; US-PATENT-CLASS-156-81; US-PATENT-CLASS-156-499) Avail: US Patent and Trademark Office CSCL 11A

An assembly of ceramic surfaces particularly refractory metal oxides and carbides, abutting a thin sheet of metal susceptor material are placed in a chamber of an enclosure containing inert gas. An RF coil is activated by power supply to melt the susceptor and adjacent zones of the ceramic. Reactive gas such as oxygen or a carbonizing gas is then fed to the chamber and reacts with the susceptor to form compounds which disperse and dissolve in the zones. On cooling, a strong joint is formed. The susceptor may contain inner perforations and outer perforations to aid in distribution of heat.

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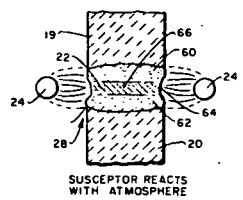


N84-22749* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
POLYPHENYLENE ETHERS WITH IMIDE LINKING GROUPS Patent
T. L. ST.CLAIR and H. D. BURKS, inventors (to NASA) 24 Apr. 1984 6 p Filed 25 Feb. 1983
(NASA-CASE-LAR-12980-1; US-PATENT-4,444,979; US-PATENT-APPL-SN-469866; US-PATENT-CLASS-528-172; US-PATENT-CLASS-528-125; US-PATENT-CLASS-528-128; US-PATENT-CLASS-528-185) Avail: US Patent and Trademark Office CSCL 11G

Novel polyphenylene ethers with imide linking units are disclosed. These polymers incorporate the solvent and thermal resistance of polyimides and the processability of polyphenylene ethers. Improved physical properties over those of the prior art are obtained by incorporating meta linked ethers and/or polyphenylene oxides into the polymer backbone. A novel process for making polymers of this type is also disclosed. The process is unique in that the expected need of high process temperatures and/or special atmospheres are eliminated.

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

N84-22750* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
CARBORANYLMETHYLENE-SUBSTITUTED PHOSPHAZENES AND POLYMERS THEREOF Patent
H. R. ALLCOCK (Pennsylvania State Univ., University Park) and A. G. SCOPELIANOS, inventors (to NASA) (Pennsylvania State Univ., University Park) 24 Apr. 1984 8 p Filed 3 May 1983 Sponsored by NASA
(NASA-CASE-ARC-11370-1; US-PATENT-4,444,972; US-PATENT-APPL-SN-491125; US-PATENT-CLASS-528-6; US-PATENT-CLASS-525-389; US-PATENT-CLASS-528-7; US-PATENT-CLASS-528-394; US-PATENT-CLASS-528-399; US-PATENT-CLASS-568-4; US-PATENT-CLASS-568-5) Avail: US Patent and Trademark Office CSCL 11G

Carboranylmethylene-substituted cyclophosphazenes are described which can be thermally polymerized into carboranylmethylene-substituted phosphazene polymers. The polymers are useful as thermally stable coatings. Also, due to the characteristics of these polymers in acting as a ligand for transition metals, metalocarboranylmethylene phosphazene polymers are described which can act as immobilized catalyst systems, and are electrically conductive and superconductive.

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

N84-24805*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PHENOXY RESINS CONTAINING PENDENT ETHYNYL GROUPS AND CURED RESINS THEREFROM Patent Application
P. M. HERGENROTHER, inventor (to NASA) 10 May 1984 17 p
(NASA-CASE-LAR-13262-1; US-PATENT-APPL-SN-608741)
Avail: NTIS HC A02/MF A01 CSCL 11C

Phenoxy resins containing pendent ethynyl groups, the process for preparing the same, and the cured resin products obtained therefrom, are discussed. Upon the application of heat, the ethynyl groups react to provide branching and crosslinking. The cure temperature can be lowered by using a catalyst, but this step is not required. The cured phenoxy resins containing pendent ethynyl groups have improved solvent resistance and higher use temperature than linear uncrosslinked phenoxy resins. These improved thermoplastics are applicable for use as coatings, films, adhesives, composited matrices, and molding compounds.

NASA

N84-24806*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DIFFUSELY REFLECTING PAINTS INCLUDING POLYTETRAFLUOROETHYLENE AND METHOD OF MANUFACTURE Patent Application
M. C. SHAI and J. B. SCHUTT, inventors (to NASA) 26 Apr. 1984 11 p
(NASA-CASE-GSC-12883-1; US-PATENT-APPL-SN-604337)

Avail: NTIS HC A02/MF A01 CSCL 11C

A highly diffuse, reflective paint is described which is comprised of an alcohol soluble binder, polytetrafluoroethylene (TFE) and an alcohol for coating a substrate and forms an optical reference with a superior Lambertian characteristic. A method for making the paint by first mixing the binder and alcohol, and thereafter by mixing in outgassed TFE is presented. A wetting agent may be employed to aid the mixing process. NASA

N84-24807*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

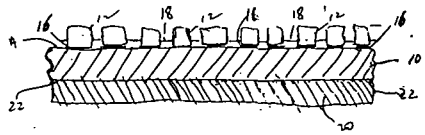
COATED FLEXIBLE LAMINATE AND METHOD OF ITS PRODUCTION Patent Application

J. J. PARK, inventor (to NASA) 2 May 1984 9 p

(NASA-CASE-GSC-12913-1; US-PATENT-APPL-SN-606430)

Avail: NTIS HC A02/MF A01 CSCL 11B

The use of silicone as a protective coating on Kapton (trademark), a polyimide film, is described. Because of its flexibility, Kapton is considered the material best suited for use in fabrication of large, rollable, and foldable solar cells needed for spacecraft. Silicone adhesive coatings protect the emissivity and absorptivity characteristics of a Kapton layer solar array so that they change less than 0.01%, even when subjected to a high concentration of oxygen atoms in a space atmosphere. A method of applying the silicone coating is also described. R.S.F.



N84-27884* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

METAL PHTHALOCYANINE POLYMERS Patent

B. N. ACHAR (NAS-NRC, Washington, D.C.), G. M. FOHLEN, and J. A. PARKER, inventors (to NASA) 22 May 1984 9 p Filed 8 Sep. 1982 Supersedes N83-12239 (21 - 03, p 0348)

(NASA-CASE-ARC-11405-1; US-PATENT-4,450,268; US-PATENT-APPL-SN-415880; US-PATENT-CLASS-528-327; US-PATENT-CLASS-528-271; US-PATENT-CLASS-528-310; US-PATENT-CLASS-528-331; US-PATENT-CLASS-528-362)

Avail: US Patent and Trademark Office CSCL 11G

Metal 4, 4', 4', 4"=tetracarboxylic phthalocyanines (MPTC) are prepared by reaction of trimellitic anhydride, a salt or hydroxide of the desired metal (or the metal in powdered form), urea and a catalyst. A purer form of MPTC is prepared than heretofore. These tetracarboxylic acids are then polymerized by heat to sheet polymers which have superior heat and oxidation resistance. The metal is preferably a divalent metal having an atomic radius close to 1.35A.

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

N84-27885* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

CHEMICAL APPROACH FOR CONTROLLING NADIMIDE CURE TEMPERATURE AND RATE Patent

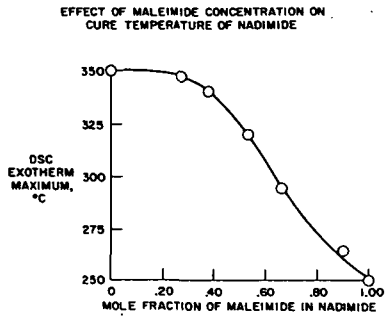
R. W. LAUVER, inventor (to NASA) 19 Jun. 1984 9 p Filed 3 Aug. 1982 Supersedes N83-13258 (21 - 04, p 0497)

(NASA-CASE-LEW-13770-1; US-PATENT-4,455,418; US-PATENT-APPL-SN-404809; US-PATENT-CLASS-528-322; US-PATENT-CLASS-526-262; US-PATENT-CLASS-528-342)

Avail: US Patent and Trademark Office CSCL 11G

Polyimide resins suitable for use as composite matrix materials are formed by copolymerization of maleic and norbornenyl endcapped monomers and oligomers. The copolymers can be cured at temperatures under about 300 C by controlling the available concentration of the maleic capped reactant. This control can be achieved by adding sufficient amounts of said maleic reactant, or by chemical modification of either copolymer, so as to either increase Diels-Alder retrogression of the norbornenyl capped reactant and/or holding initiation and polymerization to a rate compatible with the availability of the maleic capped reactant.

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



N84-27886* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SHELL TILE THERMAL PROTECTION SYSTEM Patent

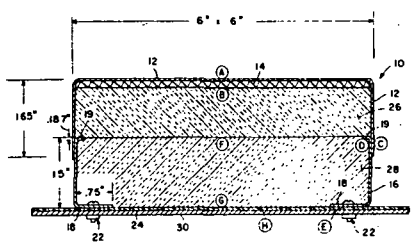
I. O. MACCONOCHIE, A. G. LAWSON, and H. N. KELLY, inventors (to NASA) 26 Jun. 1984 11 p Filed 20 Oct. 1982 Supersedes N83-17602 (21 - 08, p 1145)

(NASA-CASE-LAR-12862-1; US-PATENT-4,456,208; US-PATENT-APPL-SN-435511; US-PATENT-CLASS-244-158A; US-PATENT-CLASS-244-117A; US-PATENT-CLASS-220-306)

Avail: US Patent and Trademark Office CSCL 11G

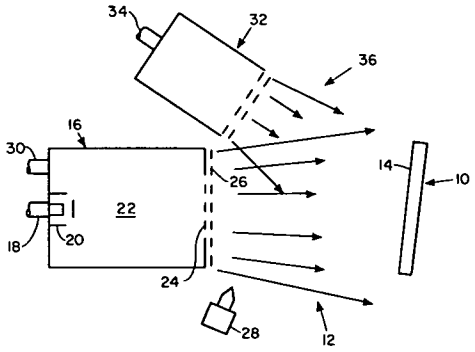
A reusable, externally applied thermal protection system for use on aerospace vehicles subject to high thermal and mechanical stresses utilizes a shell tile structure which effectively separates its primary functions as an insulator and load absorber. The tile consists of structurally strong upper and lower metallic shells manufactured from materials meeting the thermal and structural requirements incident to tile placement on the spacecraft. A lightweight, high temperature package of insulation is utilized in the upper shell while a lightweight, low temperature insulation is utilized in the lower shell. Assembly of the tile which is facilitated by a self-locking mechanism, may occur subsequent to installation of the lower shell on the spacecraft structural skin.

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



N84-28986*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DEPOSITION OF DIAMONDLIKE CARBON FILMS Patent Application
M. J. MIRTICH, J. S. SOVEY, and B. A. BANKS, inventors (to NASA) 9 Jul. 1984 10 p
(NASA-CASE-LEW-14080-1; US-PATENT-APPL-SN-628866)
Avail: NTIS HC A02/MF A01 CSCL 11G

A diamondlike carbon film is deposited in the surface of a substrate by exposing the surface to an argon ion beam containing a hydrocarbon. The current density in the ion beam is low during initial deposition of the film. Subsequent to this initial low current condition, the ion beam is increased to full power. At the same time a second argon ion beam is directed toward the surface of the substrate. The second ion beam has an energy level much greater than that of the ion beam containing the hydrocarbon. This addition of energy to the system increases mobility of the condensing atoms and serves to remove lesser bound atoms. NASA



N84-28987*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SULFONE-ESTER POLYMERS CONTAINING PENDENT ETHYNYL GROUPS Patent Application
P. M. HERGENROTHER and B. J. JENSEN, inventors (to NASA) 23 May 1984 19 p
(NASA-CASE-LAR-13316-1; US-PATENT-APPL-SN-613139)
Avail: NTIS HC A02/MF A01 CSCL 11B

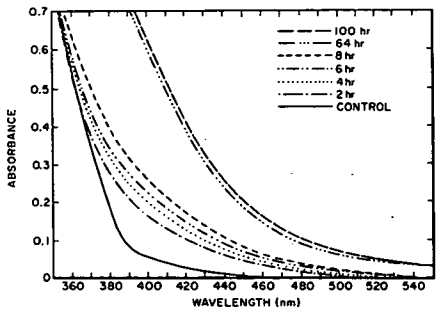
Sulfone ester polymers containing pendent ethynyl groups and a direct and multistep process for their preparation are disclosed. The process involves the conversion of a pendent bromo group to the ethynyl group while the direct route involves reacting hydroxy-terminated sulfone oligomer or polymers with a stoichiometric amount of 5(4-ethynyl phenoxy)isophthaloyl chloride. The 5(4-ethynyl phenoxy)isophthaloyl chloride synthesis procedures are also disclosed. NASA

N84-28988*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ETHYNYL-TERMINATED ESTER OLOGOMERS AND POLYMERS THEREFROM Patent Applications
P. M. HERGENROTHER and S. J. HAVENS, inventors (to NASA) 23 May 1984 18 p
(NASA-CASE-LAR-13118-1; US-PATENT-APPL-SN-613138)
Avail: NTIS HC A02/MF A01 CSCL 11B

A class of ethynyl terminated oligomers and the process for preparing same are disclosed. Upon the application of heat, with or without a catalyst, the ethynyl groups react to provide crosslinking and chain extension to increase the polymer use temperature and improve the polymer solvent resistance. These polyesters are potentially useful in packaging, magnetic tapes, capacitors, industrial belting, protective coatings, structural adhesives and composite matrices. NASA

N84-32530*# National Aeronautics and Space Administration. Pasadena Office, Calif.
STABILIZED UNSATURATED POLYESTERS Patent Application
E. BORSIG (JPL, California Inst. of Tech., Pasadena) and O. VOGL, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 6 Jun. 1984 23 p
(Contract NAS7-100)
(NASA-CASE-NPO-16103-1; NAS 1.71:NPO-16103-1; US-PATENT-APPL-SN-617871) Avail: NTIS HC A02/MF A01 CSCL 11C

An unsaturated polyester, such as propylene glycol-maleic acid-phtatic acid prepolymer dissolved in styrene is interpolymerized with an ultraviolet absorber and/or an antioxidant to form a polymer stable to exposure to the outdoors without degradation by ultraviolet radiation, thermal and/or photooxidation. NASA



N84-32532*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STRUCTURAL PRESSURE SENSITIVE SILICONE ADHESIVES Patent Application
J. L. LEIFFER, W. E. STOOPS, JR., T. L. ST.CLAIR, V. E. WATKINS, JR., and T. P. KELLY, inventors (to NASA) 12 Jan. 1984 8 p Continuation-in-Part of US-Patent-Appl-SN-322320, filed 17 Nov. 1981
(NASA-CASE-LAR-13270-1; NAS 1.71:LAR-13270-1; US-PATENT-APPL-SN-569536) Avail: NTIS HC A02/MF A01 CSCL 11A

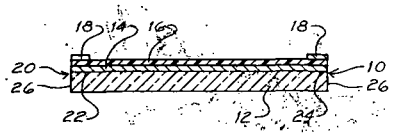
An intermediate molecular weight pressure sensitive silicone adhesive is blended with a silicone system, which generally cures with a catalyst to a rubbery tack-free state, to form a pressure sensitive silicone adhesive which is used for structural or load bearing applications without creeping. The adhesive was formulated to give various degrees of tackiness and loading bearing capabilities. This adhesive was successfully utilized from -45 C to +232 C with the tackiness for a 60/40 (tackifier/cured silicone system) pressure sensitive silicone mixture ranging from slight at -45 C to extremely tacky at 232 C. NASA

N84-33589* National Aeronautics and Space Administration. Pasadena Office, Calif.
GLASS HEATING PANELS AND METHOD FOR PREPARING THE SAME FROM ARCHITECTURAL REFLECTIVE GLASS Patent

P. J. SHLICHTA (JPL, California Inst. of Tech., Pasadena) and B. A. NERAD, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 10 Jul. 1984 11 p Filed 26 Jan. 1982 Supersedes N82-23396 (20 - 14, p 1927) Sponsored by NASA
(NASA-CASE-NPO-15753-1; NAS 1.71:NPO-15753-1; US-PATENT-4,459,470; US-PATENT-APPL-SN-342871; US-PATENT-CLASS-219-522; US-PATENT-CLASS-219-203; US-PATENT-CLASS-219-543; US-PATENT-CLASS-219-541; US-PATENT-CLASS-219-219; US-PATENT-CLASS-338-309; US-PATENT-CLASS-428-432) Avail: US Patent and Trademark Office CSCL 11B

Electrodes are positioned in intimate contact with an outer surface of a thin electrically insulating protecting layer of architectural reflective glass. Application of a voltage of sufficient magnitude substantially destroys the insulating layer located beneath the electrodes. A subsequent application of voltage results in a passage of current through the underlying thin, light reflective metal or metal oxide layer and in concomitant output of heat.

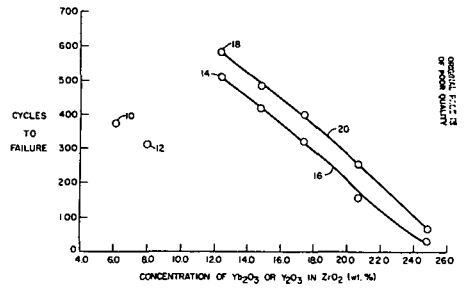
NASA



N84-33595*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IMPROVED THERMAL BARRIER COATING SYSTEM Patent Application
S. STECURA, inventor (to NASA) 14 Aug. 1984 8 p
(NASA-CASE-LEW-14057-1; NAS 1.71:LEW-14057-1; US-PATENT-APPL-SN-640712) Avail: NTIS HC A02/MF A01 CSCL 11G

An oxide thermal barrier coating is described which comprises ZrO3 - Yb2O3 that is plasma sprayed onto a previously applied bond coating. The zirconia is partially stabilized with about 12.4 v/o ytterbia to insure cubic, monoclinic, and tetragonal phases.

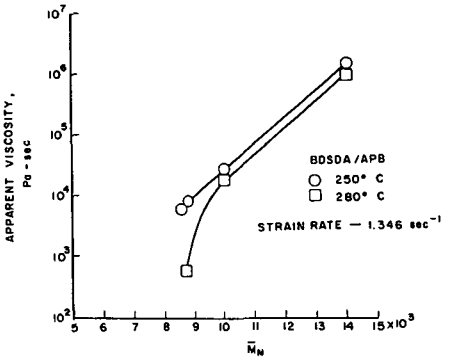
NASA



N84-34616*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MELT-FLOW-TOUGHNESS MODIFIED POLYIMIDE Patent Application
T. L. ST.CLAIR and H. D. BURKS, inventors (to NASA) 11 Sep. 1984 11 p
(NASA-CASE-LAR-13135-1; NAS 1.71:LAR-13135-1; US-PATENT-APPL-SN-649328) Avail: NTIS HC A02/MF A01 CSCL 11B

A process is disclosed for endcapping a polyimide system with an endcapping agent in order to achieve a controlled decrease in molecular weight and melt viscosity along with predictable fracture resistance of the molded products. The uncapped system is formed by combining an equimolar ratio of 4,4'-bis(3,4-dicarboxyphenoxy) disphenyl-sulfide dianhydride (BDSDA) and 1,3-bis(aminophenoxy)benzene (APB) dissolved in bis(2-methoxyethyl)ether. The endcapped system is formed by dissolving AFB in bis-(2-methoxyethyl)ether, adding the endcapping agent, and then adding the BDSDA. By varying the amount of endcapping from 0 to 4%, molecular weight is decreased from 13,000 to 8,660. At a processing temperature of 250 C, there is a linear relationship between molecular weight and viscosity, with the viscosity decreasing by two orders of magnitude as the molecular weight decreased from 13,900 to 8,660. A greater drop in viscosity is noted at higher temperatures. Apparent viscosity as a function of molecular weight at 250 C and at 280 C is depicted. Reducing the molecular weight also results in a linear decrease in the fracture resistance from 4100 J/sq m to 296 J/sq m.

NASA



28

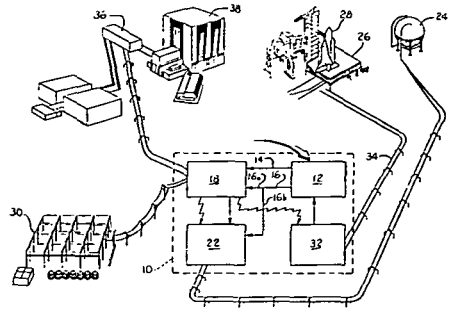
PROPELLANTS AND FUELS

Includes rocket propellants, igniters, and oxidizers; storage and handling; and aircraft fuels.

N84-29017*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
LIQUID HYDROGEN POLYGENERATION SYSTEM AND PROCESS Patent Application
P. A. MINDERMAN, G. P. GUTKOWSKI, L. MANFREDI, J. V. KING, and F. S. HOWARD, inventors (to NASA) 24 Apr. 1984 23 p
(NASA-CASE-KSC-11304-1; US-PATENT-APPL-SN-603373)
Avail: NTIS HC A02/MF A01 CSCL 21I

An integrated polygeneration system and process is disclosed for generating liquid hydrogen as a main energy product for use as a propellant for space vehicles. The integrated process includes a coal gasification and gas cleanup system, a combined cycle power generation system, a hydrogen production and liquefaction

system and a air separation system. Secondary energy products and commodities for supporting a space center complex and launching of the space vehicle includes the production of electrical and thermal energy and gaseous nitrogen. NASA



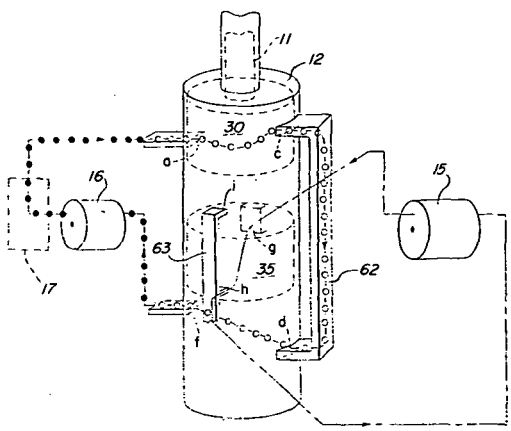
31

ENGINEERING (GENERAL)

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

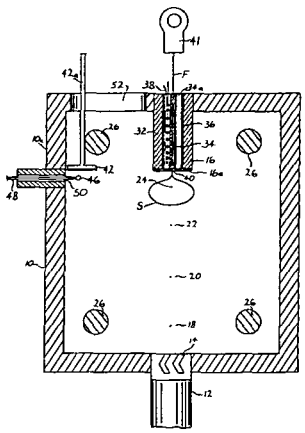
N84-24830*# National Aeronautics and Space Administration. Pasadena Office, Calif.
RECIPROCATING MAGNETIC REFRIGERATOR EMPLOYING TANDEM POROUS MATRICES WITHIN A RECIPROCATING DISPLACER Patent Application
D. L. JOHNSON, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 9 Mar. 1984 31 p
(Contract NAS7-100)
(NASA-CASE-NPO-16257-1; US-PATENT-APPL-SN-588164)
Avail: NTIS HC A03/MF A01 CSCL 13H

A method and apparatus for a magnetic refrigeration system are described. A continuously reciprocating displacer houses at least a pair of paramagnetic substances each of which is alternately driven into and out of a magnetic field. Two separate bidirectional pumping systems flow helium gas through the displacer and through both paramagnetic substances to create heat exchange conditions at two separate temperature extremes. NASA



N84-32569*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
CONTAINERLESS HIGH PURITY PULLING PROCESS AND APPARATUS FOR GLASS FIBERS Patent Application
R. J. NAUMANN and E. C. ETHRIDGE, inventors (to NASA) 19 Apr. 1984 13 p
(NASA-CASE-MFS-25905-2; NAS 1.71:MFS-25905-2; US-PATENT-APPL-SN-601130) Avail: NTIS HC A02/MF A01 CSCL 13H

An apparatus and method for pulling optical glass fibers in a containerless environment is disclosed which includes a single axis acoustic levitation furnace in which a specimen is levitated and melted. A reflector unit is carried in the interior of the furnace and includes a reflector disposed centrally about the acoustic axis of the levitator. A fiber pulling bore is formed centrally in the reflector unit surrounded by cooling jacket to enhance solidification and formation of a fiber. A starting fiber strand is introduced into the melt and pulled outwardly through the bore whereby the specimen fiber is started and formed as pulled therethrough. A movable secondary reflector is provided which captures a supplemental specimen pellet and transfer it to the melt. NASA



32

COMMUNICATIONS

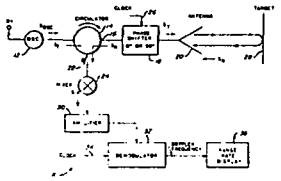
Includes land and global communications; communications theory; and optical communications.

N84-22820* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
DOPPLER RADAR HAVING PHASE MODULATION OF BOTH TRANSMITTED AND REFLECTED RETURN SIGNALS Patent
H. S. KOBAYASHI, P. W. SHORES, and P. ROZAS, inventors (to NASA) 27 Mar. 1984 8 p Filed 22 May 1981
(NASA-CASE-MSC-18675-1; US-PATENT-4,439,766; US-PATENT-APPL-SN-266687; US-PATENT-CLASS-343-9R; US-PATENT-CLASS-343-17.5) Avail: US Patent and Trademark Office CSCL 17I

A microwave radar signal is generated for transmission through an antenna. Before transmission, the signal is phase modulated by 0 deg or 90 deg amounts during each alternate half-cycles of an intermediate frequency (IF) clock signal. After transmission and return, the signal is again phase modulated the same amounts during each alternate half-cycles. The return phase modulated signal is mixed with a leakage signal component of the microwave

signal, leaving an IF Doppler. The IF Doppler signal may then be amplified, removing any requirement that direct current level signals be amplified and also removing the effect of detector noise from the Doppler signal.

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



N84-27951* National Aeronautics and Space Administration. Pasadena Office, Calif.

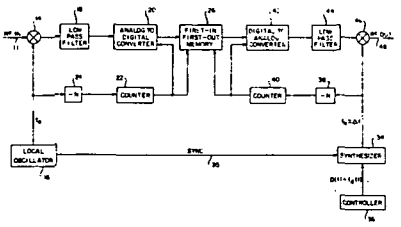
SYNTHETIC APERTURE RADAR TARGET SIMULATOR Patent

H. A. ZEBKER (JPL, California Inst. of Tech., Pasadena), D. N. HELD (JPL, California Inst. of Tech., Pasadena), R. M. GOLDSTEIN (JPL, California Inst. of Tech., Pasadena), and T. C. BICKLER (JPL, California Inst. of Tech., Pasadena) 22 May 1984 8 p Filed 17 Jul. 1981 Supersedes N82-10286 (20 - 01, p 0043) Sponsored by NASA

(NASA-CASE-NPO-15024-1; US-PATENT-4,450,447; US-PATENT-APPL-SN-284287; US-PATENT-CLASS-343-17.7; US-PATENT-CLASS-434-2) Avail: US Patent and Trademark Office CSCL 17B

A simulator for simulating the radar return, or echo, from a target seen by a SAR antenna mounted on a platform moving with respect to the target is described. It includes a first-in first-out memory which has digital information clocked in at a rate related to the frequency of a transmitted radar signal and digital information clocked out with a fixed delay defining range between the SAR and the simulated target, and at a rate related to the frequency of the return signal. An RF input signal having a frequency similar to that utilized by a synthetic aperture array radar is mixed with a local oscillator signal to provide a first baseband signal having a frequency considerably lower than that of the RF input signal.

T.M.



N84-27952* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

METHOD AND APPARATUS FOR RECEIVING AND TRACKING PHASE MODULATED SIGNALS Patent

S. VILLARREAL, S. D. LENETT, H. S. KOBAYASHI, and J. F. PAWLOWSKI, inventors (to NASA) 19 Jun. 1984 8 p Filed 7 May 1980 Supersedes N81-16338 (19 - 07, p 0900) Continuation of abandoned US Patent-Appl-SN-737975, filed 2 Nov. 1976 (NASA-CASE-MSC-16170-2; US-PATENT-4,455,680; US-PATENT-APPL-SN-147695; US-PATENT-CLASS-455-208; US-PATENT-CLASS-455-202; US-PATENT-CLASS-455-265; US-PATENT-CLASS-455-260; US-PATENT-CLASS-375-77; US-PATENT-CLASS-375-81; US-PATENT-CLASS-375-120; US-PATENT-CLASS-329-124; US-PATENT-APPL-SN-737975) Avail: US Patent and Trademark Office CSCL 17B

An apparatus and technique are described for receiving and tracking analog or digital phase modulated signals from 0 deg to 360 deg phase shift. In order to track a signal with many phases, a detector discerns the phase modulation of the incoming signal and a phase shifter generates a negative phase shift opposite in angle to the detected phase angle. This produces a converted series sideband component barrier signal. The residual carrier signal and the converted series sideband component carrier are added together to produce a tracking carrier signal. The tracking carrier signal is multiplied with the output from a voltage controlled oscillator in the tracking loop to obtain an error signal which drives the voltage controlled oscillator and tracks the incoming signal frequency. The technique is less susceptible to carrier interference which may degrade tracking and tracking may be performed at lower signal to noise ratios and for lower input signal power levels. Official Gazette of the U.S. Patent and Trademark Office

N84-32620*# National Aeronautics and Space Administration. Pasadena Office, Calif.

SYNCHRONIZATION TRACKING IN PULSE POSITION MODULATION RECEIVER Patent Application

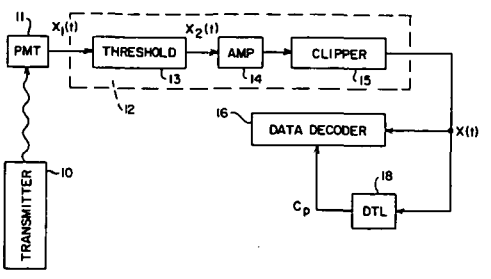
V. A. VILNROTTER, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 7 Aug. 1984 14 p

(Contract NAS7-100)

(NASA-CASE-NPO-16256-1; NAS 1.71:NPO-16256-1; US-PATENT-APPL-SN-638586) Avail: NTIS HC A02/MF A01 CSCL 17B

A clock pulse generator for decoding pulse position modulation in an optical communication receiver is synchronized by a delay tracking loop which multiplies impulses of a data pulse by the square wave clock pulses from the generator to produce positive impulses when the clock pulse is of one level, and negative impulses when the clock pulse is of another level. A delay tracking loop integrates the impulses and produces an error signal that adjusts the delay so the clock pulses will be synchronized with data pulses. A dead time tau(d) provided between data pulses of an interval tau(p) in the data pulse period tau. When synchronized, the average number of positive impulses integrated will equal the average number of negative impluses over the continuous stream of data pulses.

NASA



N84-34651* National Aeronautics and Space Administration. Pasadena Office, Calif.

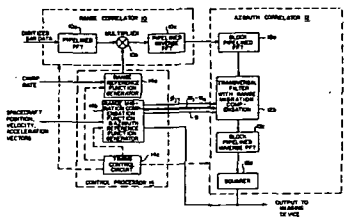
PIPELINED DIGITAL SAR AZIMUTH CORRELATOR USING HYBRID FFT-TRANSVERSAL FILTER Patent

C. WU (JPL, California Inst. of Tech., Pasadena) and K. Y. LIU, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 11

Sep. 1984 22 p Filed 26 Oct. 1981 Supersedes N82-12298 (03 - 20, p 0326) Sponsored by NASA
(NASA-CASE-NPO-15519-1; NAS 1.71:NPO-15519-1; US-PATENT-4,471,357; US-PATENT-APPL-SN-314928; US-PATENT-CLASS-343-5-CM; US-PATENT-CLASS-343-5-FT; US-PATENT-CLASS-343-5-DP) Avail: US Patent and Trademark Office CSCL 17I

A synthetic aperture radar system (SAR) having a range correlator is provided with a hybrid azimuth correlator which utilizes a block-pipe-lined fast Fourier transform (FFT). The correlator has a predetermined FFT transform size with delay elements for delaying SAR range correlated data so as to embed in the Fourier transform operation a corner-turning function as the range correlated SAR data is converted from the time domain to a frequency domain. The azimuth correlator is comprised of a transversal filter to receive the SAR data in the frequency domain, a generator for range migration compensation and azimuth reference functions, and an azimuth reference multiplier for correlation of the SAR data. Following the transversal filter is a block-pipelined inverse FFT used to restore azimuth correlated data in the frequency domain to the time domain for imaging.

R.S.F.



33

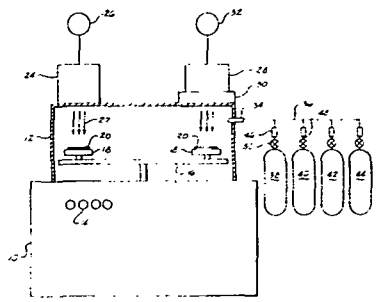
ELECTRONICS AND ELECTRICAL ENGINEERING

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

N84-22884* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD FOR SEQUENTIALLY PROCESSING A MULTI-LEVEL INTERCONNECT CIRCUIT IN A VACUUM CHAMBER Patent
D. E. ROUTH and G. C. SHARMA, inventors (to NASA) (Sharma and Associates, Huntsville, Ala.) 20 Mar. 1984 7 p Filed 19 Aug. 1982
(NASA-CASE-MFS-256704-1; US-PATENT-4,437,961; US-PATENT-APPL-SN-409679; US-PATENT-CLASS-204-192EC) Avail: US Patent and Trademark Office CSCL 09C

An apparatus is disclosed which includes a vacuum system having a vacuum chamber in which wafers are processed on rotating turntables. The vacuum chamber is provided with an RF sputtering system and a dc magnetron sputtering system. A gas inlet introduces various gases to the vacuum chamber and creates various gas plasma during the sputtering steps. The rotating turntables insure that the respective wafers are present under the sputtering guns for an average amount of time such that consistency in sputtering and deposition is achieved. By continuous and sequential processing of the wafers in a common vacuum chamber without removal, the adverse affects of exposure to atmospheric conditions are eliminated providing higher quality circuit contacts and functional device.

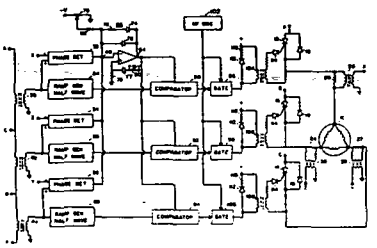
Official Gazette of the U.S. Patent and Trademark Office



N84-22885* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THREE PHASE POWER FACTOR CONTROLLER Patent
F. J. NOLA, inventor (to NASA) 21 Feb. 1984 11 p Filed 14 Mar. 1983 Continuation of abandoned US Patent Appl. SN-199765, filed 23 Oct. 1983
(NASA-CASE-MFS-25535-2; US-PATENT-4,433,276; US-PATENT-APPL-SN-476244; US-PATENT-CLASS-318-729; US-PATENT-CLASS-318-798; US-PATENT-CLASS-318-805; US-PATENT-CLASS-318-810; US-PATENT-CLASS-318-438) Avail: US Patent and Trademark Office CSCL 09C

A power control circuit for a three phase induction motor is described. Power factors for the three phases are summed to provide a control signal, and this control signal is particularly filtered and then employed to control the duty cycle of each phase of input power to the motor.

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

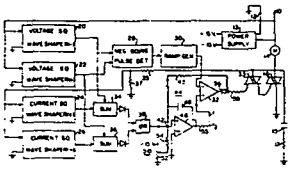


N84-22886* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MOTOR POWER CONTROL CIRCUIT FOR AC INDUCTION MOTORS Patent
F. J. NOLA, inventor (to NASA) 27 Mar. 1983 7 p Filed 28 Aug. 1981
(NASA-CASE-MFS-25323-1; US-PATENT-4,439,718; US-PATENT-APPL-SN-297524; US-PATENT-CLASS-318-729; US-PATENT-CLASS-318-812) Avail: US Patent and Trademark Office CSCL 09A

A motor power control of the type which functions by controlling the power factor wherein one of the parameters of power factor current on time is determined by the on time of a triac through

which current is supplied to the motor. By means of a positive feedback circuit, a wider range of control is effected.

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



N84-22887* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

LOW NOISE TUNED AMPLIFIER Patent

L. L. KLEINBERG, inventor (to NASA) 13 Mar. 1984 7 p Filed 12 Jun. 1981

(NASA-CASE-GSC-12567-1; US-PATENT-4,437,069; US-PATENT-APPL-SN-373839; US-PATENT-CLASS-330-109; US-PATENT-CLASS-330-277; US-PATENT-CLASS-330-294)

Avail: US Patent and Trademark Office CSCL 09A

A bandpass amplifier employing a field effect transistor amplifier first stage is described with a resistive load either a.c. or directly coupled to the non-inverting input of an operational amplifier second stage which is loaded in a Wien Bridge configuration. The bandpass amplifier may be operated with a signal injected into the gate terminal of the field effect transistor and the signal output taken from the output terminal of the operational amplifier. The operational amplifier stage appears as an inductive reactance, capacitive reactance and negative resistance at the non-inverting input of the operational amplifier, all of which appear in parallel with the resistive load of the field effect transistor.

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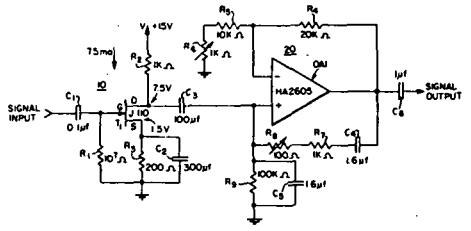

N84-27974* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

DIELECTRIC BASED SUBMILLIMETER BACKWARD WAVE OSCILLATOR CIRCUIT Patent

H. G. KOSMAHL, inventor (to NASA) 10 Jul. 1984 6 p Filed 13 Oct. 1982 Supersedes N83-17802 (21 - 08, p 1176)

(NASA-CASE-LEW-13736-1; US-PATENT-4,459,562; US-PATENT-APPL-SN-434084; US-PATENT-CLASS-331-82; US-PATENT-CLASS-315-3.6; US-PATENT-CLASS-315-39.3; US-PATENT-CLASS-333-162) Avail: US Patent and Trademark Office CSCL 09C

A ladder circuit especially useful in backward wave oscillators operating in the 500 GHz to 2000 GHz range has a waveguide with transversely orientated slabs which contact an upper wall of the waveguide. The edges of the slabs adjacent to the physical center of waveguide are curved segments and stubs of electrically conductive, nonmagnetic material. The ends of slabs include metal layers at opposite ends to provide a conductive leakage path. A ridge bar is attached to the inside of the bottom wall of the waveguide and includes a concave upper surface which partially straddles the electron beam. The novelty of the invention lies in the ladder structure compared of thin, vapor deposited rungs supported on the edge of diamond slabs; each rung having a curved segment which straddles the electron beam together with a ridge bar which also straddles the electron beam.

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

N84-27975* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

PHASE DETECTOR FOR THREE-PHASE POWER FACTOR CONTROLLER Patent

F. J. NOLA, inventor (to NASA) 10 Jul. 1984 10 p Filed 16 Dec. 1982 Supersedes N83-17804 (21 - 08, p 1176)

(NASA-CASE-MFS-25854-1; US-PATENT-4,459,528; US-PATENT-APPL-SN-450166; US-PATENT-CLASS-318-729; US-PATENT-CLASS-318-809; US-PATENT-CLASS-323-300)

Avail: US Patent and Trademark Office CSCL 09C

A phase detector for the three phase power factor controller (PFC) is described. The phase detector for each phase includes an operational amplifier which senses the current phase angle for that phase by sensing the voltage across the phase thyristor. Common mode rejection is achieved by providing positive feedback between the input and output of the voltage sensing operational amplifier. this feedback preferably comprises a resistor connected between the output and input of the operational amplifier. The novelty of the invention resides in providing positive feedback such that switching of the operational amplifier is synchronized with switching of the voltage across the thyristor. The invention provides a solution to problems associated with high common mode voltage and enables use of lower cost components than would be required by other approaches.

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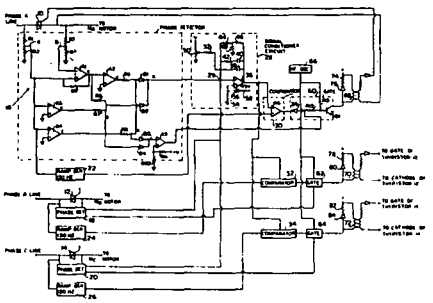


N84-29084*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

OXYGEN RECOMBINATION IN INDIVIDUAL PRESSURE VESSEL NICKEL-HYDROGEN BATTERIES Patent Application

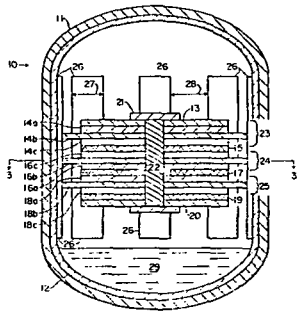
J. J. SMITHRICK, inventor (to NASA) 27 Jun. 1984 12 p

(NASA-CASE-LEW-13822-1; US-PATENT-APPL-SN-625077)

Avail: NTIS HC A02/MF A01 CSCL 10C

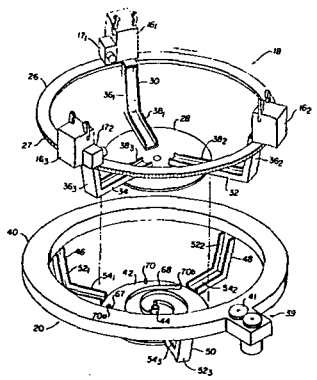
In a metal hydrogen cell of the type including a number of electrical cell units in back-to-back relationship and which may be lined with a wick, one or more catalyzed sites are provided on the inner surface of the cell. Separators between the respective metal and hydrogen electrodes of each cell unit have gas directing notches around their peripheries to facilitate the desired movement of gasses within the metal-hydrogen cell. Any two metal electrodes

separated by a gas screen and including apertures which may be required to accommodate compression means such as bolts, are provided with gas tight seals between the electrodes at each aperture. The sealing means may be ring of rubber or elastomeric material which is somewhat compressible but non-reactive with other materials in the cell. NASA



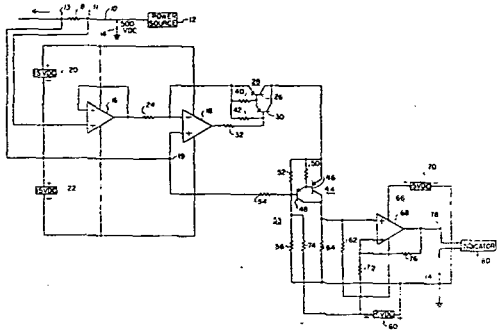
N84-29085*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ROTATABLE ELECTRIC CABLE CONNECTING SYSTEM Patent Application
D. R. MANGES, inventor (to NASA) 23 May 1984 15 p
(NASA-CASE-GSC-12899-1; US-PATENT-APPL-SN-613140)
Avail: NTIS HC A02/MF A01 CSCL 09C

A cable reel assembly is described that is particularly adapted for, but not limited to, a system for providing electrical connection of power and data signals between an orbiter vehicle, and a recovered satellite and being comprised of two mutually opposing ring type structures having plus or minus 180 degree relative rotation with one of the structures being held in fixed position while the other structure is rotatable. The cable sections are fed out as three output cable sections through openings in the central portion of the circular plate of the rotatable ring structure where they are directed to the latches and connectors located on its rim. NASA



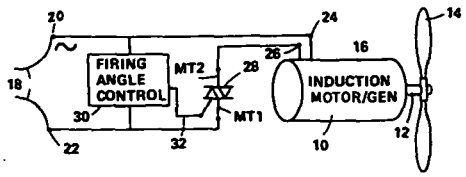
N84-32680*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MEASUREMENT AMPLIFIER Patent Application
F. E. LUKENS, inventor (to NASA) (Martin Marietta Aerospace, Denver) 7 Aug. 1984 13 p Sponsored by NASA
(NASA-CASE-MFS-25868-1; NAS 1.71:MFS-25868-1;
US-PATENT-APPL-SN-638584) Avail: NTIS HC A02/MF A01
CSCL 09A

A high common mode rejection differential amplifier wherein two serially arranged Darlington amplifier stages are employed and any common mode voltage is divided between them by a resistance network is described. The input to the first Darlington amplifier stage is coupled to a signal input resistor via an amplifier which isolates the input and presents a high impedance across this resistor. The output of the second Darlington stage is transposed in scale via an amplifier stage which has in its input a biasing circuit which effects a finite biasing of the two Darlington amplifier stages. NASA



N84-33660* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
COUPLING AN INDUCTION MOTOR TYPE GENERATOR TO AC POWER LINES Patent
F. J. NOLA, inventor (to NASA) 25 Sep. 1984 11 p Filed 31 Mar. 1983 Supersedes N83-24768 (21 - 14, p 2208) Continuation-in-part of US Patent-4,388,585, US Patent Appl-SN-243683, filed 16 Mar. 1981
(NASA-CASE-MFS-25302-2; NAS 1.71:MFS-25302-2;
US-PATENT-4,473,792; US-PATENT-APPL-SN-481086;
US-PATENT-CLASS-322-47; US-PATENT-CLASS-322-29;
US-PATENT-CLASS-322-25; US-PATENT-CLASS-322-95;
US-PATENT-CLASS-307-87; US-PATENT-4,388,585;
US-PATENT-APPL-SN-243683) Avail: US Patent and Trademark Office CSCL 09C

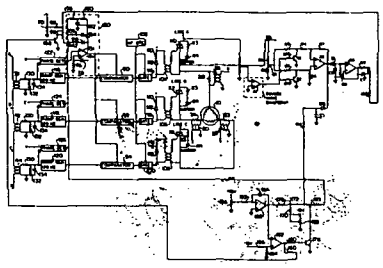
A system for coupling an induction motor type generator to an A.C. power line includes an electronic switch means that is controlled by a control system and is regulated to turn on at a relatively late point in each half cycle of its operation. The energizing power supplied by the line to the induction motor type generator is decreased and the net power delivered to the line is increased.
Official Gazette of the U.S. Patent and Trademark Office



N84-33661* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THREE-PHASE POWER FACTOR CONTROLLER WITH INDUCED EMF SENSING Patent
F. J. NOLA, inventor (to NASA) 4 Sep. 1984 10 p Filed 16 Dec. 1982 Supersedes N83-17803 (21 - 08, p 1176)
(NASA-CASE-MFS-25852-1; NAS 1.71:MFS-25852-1; US-PATENT-4,469,998; US-PATENT-APPL-SN-450319; US-PATENT-CLASS-318-729; US-PATENT-CLASS-318-802)
Avail: US Patent and Trademark Office CSCL 09C

A power factor controller for an ac induction motor is provided which is of the type comprising thyristor switches connected in series with the motor, phase detectors for sensing the motor current and voltage and providing an output proportional to the phase difference between the motor voltage and current, and a control circuit, responsive to the output of the phase detector and to a power factor command signal, for controlling switching of the thyristor. The invention involves sensing the induced emf produced by the motor during the time interval when the thyristor is off and for producing a corresponding feedback signal for controlling switching of the thyristor. The sensed emf is also used to enhance soft starting of the motor.

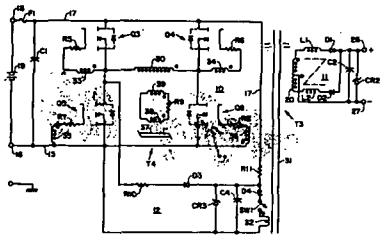
Official Gazette of the U.S. Patent and Trademark Office



N84-33663* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SIMPLIFIED DC TO DC CONVERTER Patent
R. P. GRUBER, inventor (to NASA) 7 Aug. 1984 9 p Filed 14 Apr. 1982 Supersedes N82-24432 (20 - 15, p 2079)
(NASA-CASE-LEW-13495-1; NAS 1.71:LEW-13495-1; US-PATENT-4,464,710; US-PATENT-APPL-SN-368188; US-PATENT-CLASS-363-22; US-PATENT-CLASS-363-49; US-PATENT-CLASS-323-901) Avail: US Patent and Trademark Office CSCL 09A

A dc to dc converter which can start with a shorted output and which regulates output voltage and current is described. Voltage controlled switches directed current through the primary of a transformer the secondary of which includes virtual reactance. The switching frequency of the switches is appropriately varied to increase the voltage drop across the virtual reactance in the secondary winding to which there is connected a low impedance load. A starting circuit suitable for voltage switching devices is provided.

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.

N84-22903* National Aeronautics and Space Administration. Pasadena Office, Calif.
RADIATIVE COOLER Patent
S. W. PETRICK (California Inst. of Tech., Pasadena) and R. D. GARCIA, inventors (to NASA) (California Inst. of Tech., Pasadena) 3 Jan. 1984 7 p Filed 17 Jul. 1981 Sponsored by NASA
(NASA-CASE-NPO-15465-1; US-PATENT-4,423,605; US-PATENT-APPL-SN-284289; US-PATENT-CLASS-62-467R; US-PATENT-CLASS-62-264; US-PATENT-CLASS-62-DIG.1; US-PATENT-CLASS-126-417; US-PATENT-CLASS-165-135; US-PATENT-CLASS-165-DIG.6) Avail: US Patent and Trademark Office CSCL 20D

A method and radiative cooling device for use in passively cooling spaces is described. It is applicable to any level of thermal radiation in vacuum and to high-intensity thermal radiation in non-vacuum environments. The device includes an enclosure nested in a multiplicity of thin, low-emittance, highly-reflective shields. The shields are suspended in a casing in mutual angular relation and having V-shaped spaces defined therebetween for redirecting, by reflection, toward the large openings of the V-shaped spaces, thermal radiation entering the sides of the shields, and emitted to the spaces, whereby successively reduced quantities of thermal radiation are reflected by the surfaces along substantially parallel paths extended through the V-shaped spaces to a common heat sink such as the cold thermal background of space.

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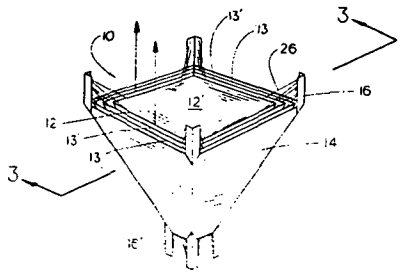
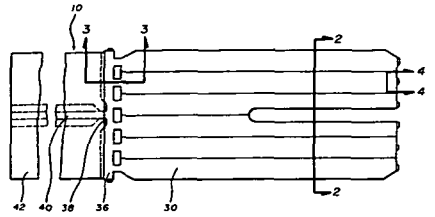


N84-32748*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
MULTI-LEG HEAT PIPE EVAPORATOR Patent Application
J. P. ALARIO, inventor (to NASA) (Grumman Aerospace Corp., Bethpage, N.Y.) 31 May 1984 12 p
(NASA-CASE-MSC-20812-1; NAS 1.71:MSC-20812-1; US-PATENT-APPL-SN-616002) Avail: NTIS HC A02/MF A01 CSCL 20D

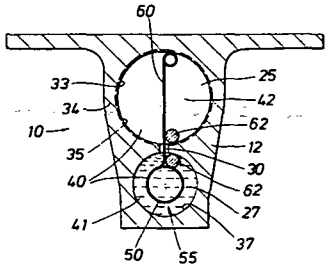
A multileg heat pipe evaporator facilitates the use and application of a monogroove heat pipe by providing an evaporation section which is compact in area and structurally more compatible with certain heat exchangers or heat input apparatus. The evaporation section of a monogroove heat pipe is formed by a series of parallel legs having a liquid and a vapor channel and a

communicating capillary slot therebetween. The liquid and vapor channels and interconnecting capillary slots of the evaporating section are connected to the condensing section of the heat pipe by a manifold connecting liquid and vapor channels of the parallel evaporation section legs with the corresponding liquid and vapor channels of the condensing section. NASA



N84-34692*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
IMPROVED MONOGROOVE HEAT PIPE DESIGN: INSULATED LIQUID CHANNEL WITH BRIDGING WICK Patent Application
J. P. ALARIO (Grumman Aerospace Corp., Bethpage, N.Y.), R. F. BROWN (Grumman Aerospace Corp., Bethpage, N.Y.), and R. KOSSON, inventors (to NASA) (Grumman Aerospace Corp., Bethpage, N.Y.) 30 May 1984 14 p
(NASA-CASE-MSC-20497-1; NAS 1.71:MSC-20497-1; US-PATENT-APPL-SN-615505) Avail: NTIS HC A02/MF A01 CSCL 20D

A screen mesh artery supported concentrically within the evaporator section of a heat pipe liquid channel retains liquid in the channel and assures continued and uniform liquid feed to the heat pipe evaporation section during periods of excessive heat transfer. NASA



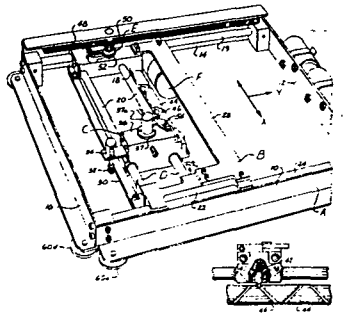
35

INSTRUMENTATION AND PHOTOGRAPHY

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

N84-22928* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
TWO-DIMENSIONAL SCANNER APPARATUS Patent
G. W. KURTZ and B. F. BANKSTON, inventors (to NASA) 6 Mar. 1984 6 p Filed 19 Feb. 1982
(NASA-CASE-MFS-25687-1; US-PATENT-4,434,659; US-PATENT-APPL-SN-350474; US-PATENT-CLASS-73-620; US-PATENT-CLASS-73-633; US-PATENT-CLASS-324-262; US-PATENT-CLASS-74-58) Avail: US Patent and Trademark Office CSCL 14B

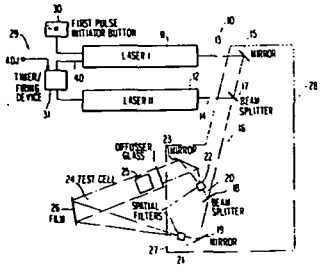
An X-Y scanner utilizes an eddy current or ultrasonic current test probe to detect surface defects in small flat plates and the like. The apparatus includes a scanner which travels on a pair of slide tubes in the X-direction. The scanner, carried on a carriage which slides in the Y-direction, is driven by a helix shaft with a closed-loop helix groove in which a follower pin carried by scanner rides. The carriage is moved incrementally in the Y-direction upon the completion of travel of the scanner back and forth in the X-direction by means of an indexing actuator and an indexing gear. The actuator is in the form of a ratchet which engages ratchet gear upon return of the scanner to the indexing position. The indexing gear is rotated a predetermined increment along a crack gear to move carriage incrementally in the Y-direction. Thus, simplified highly responsive mechanical motion may be had in a small lightweight portable unit for accurate scanning of small area. Official Gazette of the U.S. Patent and Trademark Office



N84-22929* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD OF AND APPARATUS FOR DOUBLE-EXPOSURE HOLOGRAPHIC INTERFEROMETRY Patent
W. K. WITHEROW, inventor (to NASA) 31 Jan. 1984 6 p Filed 27 Jun. 1981
(NASA-CASE-MFS-25405-1; US-PATENT-4,428,675; US-PATENT-APPL-SN-274708; US-PATENT-CLASS-356-347)
Avail: US Patent and Trademark Office CSCL 14E

Double-exposure holographic interferometry is carried out using first and second lasers responsive to respective applied firing signals for producing respective pulsed output beams. An optical system is provided oriented such that the output beams of the lasers produce coinciding scene and reference beams. An initiator circuit generates and applies a firing signal to the first laser; and a timer/firing device responsive to the generation of a firing signal by the initiator circuit, generates and applies a firing signal to the second laser a predetermined period of time later.

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



N84-22930* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MULTICOLOR PRINTING PLATE JOINING Patent
W. J. WATERS, inventor (to NASA) 20 Mar. 1984 6 p Filed 28 Sep. 1982
(NASA-CASE-LEW-13598-1; US-PATENT-4,437,923; US-PATENT-APPL-SN-425203; US-PATENT-CLASS-156-630; US-PATENT-CLASS-101-395; US-PATENT-CLASS-156-654; US-PATENT-CLASS-156-905; US-PATENT-CLASS-228-165)
Avail: US Patent and Trademark Office CSCL 14E

An upper plate having ink flow channels and a lower plate having a multicolored pattern are joined. The joining is accomplished without clogging any ink flow paths. A pattern having different colored parts and apertures is formed in a lower plate. Ink flow channels each having respective ink input ports are formed in an upper plate. The ink flow channels are coated with solder mask and the bottom of the upper plate is then coated with solder. The upper and lower plates are pressed together at from 2 to 5 psi and heated to a temperature of from 295 F to 750 F or enough to melt the solder. After the plates have cooled and the pressure is released, the solder mask is removed from the interior passageways by means of a liquid solvent.

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

N84-22931* National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD AND APPARATUS FOR PRECISION CONTROL OF RADIOMETER Patent
R. S. ESTEY (California Inst. of Tech., Pasadena) and M. F. HANNA, inventors (to NASA) (California Inst. of Tech., Pasadena) 14 Feb. 1984 8 p Filed 30 Apr. 1981 Sponsored by NASA
(NASA-CASE-NPO-15398-1; US-PATENT-4,431,306; US-PATENT-APPL-SN-259212; US-PATENT-CLASS-356-216; US-PATENT-CLASS-356-234) Avail: US Patent and Trademark Office CSCL 14B

A radiometer controller of a radiation detector is provided with a calibration method and apparatus comprised of mounting all temperature sensitive elements of the controller in thermostatically controlled ovens during calibration and measurements, using a selected temperature that is above any which might be reached in the field. The instrument is calibrated in situ by adjusting heater power (EI) to the receptor cavity in the radiometer detector to a predetermined full scale level and is displayed by a meter.

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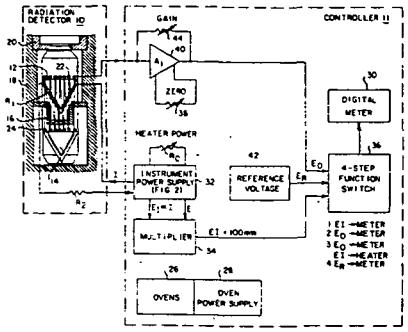
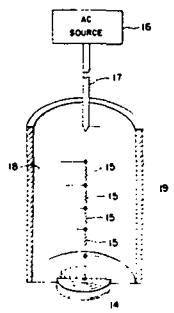


N84-22932* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ULTRASONIC TRANSDUCER WITH GAUSSIAN RADIAL PRESSURE DISTRIBUTION Patent
R. O. CLAUS (Virginia Polytechnic Inst. and State Univ.) and P. S. ZERWEKH, inventors (to NASA) (Virginia Polytechnic Inst. and State Univ.) 1 May 1984 6 p Filed 2 Sep. 1982 Sponsored by NASA
(NASA-CASE-LAR-12967-1; US-PATENT-4,446,396; US-PATENT-APPL-SN-414107; US-PATENT-CLASS-310-334; US-PATENT-CLASS-310-317; US-PATENT-CLASS-310-366)
Avail: US Patent and Trademark Office CSCL 14B

An ultrasonic transducer that produces an output that is a symmetrical function comprises a piezoelectric crystal with several concentric ring electrodes on one side of the crystal. A resistor network applies different amplitudes of an ac source to each of the several electrodes. A plot of the different amplitudes from the outermost electrode to the innermost electrode is the first half of a Gaussian function. Consequently, the output of the crystal from the side opposite the electrodes has a Gaussian profile.

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



N84-22933* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ACOUSTIC GROUND IMPEDANCE METER Patent
A. J. ZUCKERWAR, inventor (to NASA) 1 May 1984 9 p Filed 24 Nov. 1982
(NASA-CASE-LAR-12995-1; US-PATENT-4,445,378; US-PATENT-APPL-SN-444150; US-PATENT-CLASS-73-589;

US-PATENT-CLASS-73-594; US-PATENT-CLASS-367-189; US-PATENT-CLASS-181-121) Avail: US Patent and Trademark Office CSCL 14B

A method and apparatus are presented for measuring the acoustic impedance of a surface in which the surface is used to enclose one end of the chamber of a Helmholz resonator. Acoustic waves are generated in the neck of the resonator by a piston driven by a variable speed motor through a cam assembly. The acoustic waves are measured in the chamber and the frequency of the generated acoustic waves is measured by an optical device. These measurements are used to compute the compliance and conductance of the chamber and surface combined. The same procedure is followed with a calibration plate having infinite acoustic impedance enclosing the chamber of the resonator to compute the compliance and conductance of the chamber alone. Then by subtracting, the compliance and conductance for the surface is obtained.

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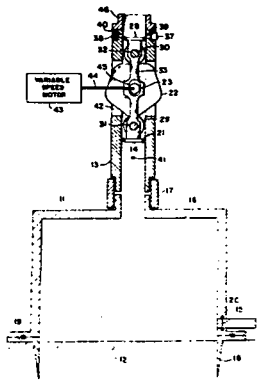


N84-22934* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

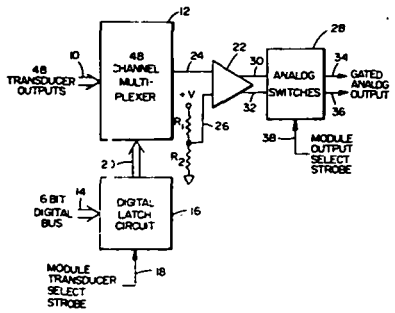
ELECTRONIC SCANNING PRESSURE MEASURING SYSTEM AND TRANSDUCER PACKAGE Patent

C. F. COE, inventor (to NASA) and G. T. PARRA 17 Apr. 1984 14 p Filed 30 Apr. 1982

(NASA-CASE-ARC-11361-1; US-PATENT-4,442,716; US-PATENT-APPL-SN-373771; US-PATENT-CLASS-73-756; US-PATENT-CLASS-73-147; US-PATENT-CLASS-73-721; US-PATENT-CLASS-340-870.13) Avail: US Patent and Trademark Office CSCL 14B

An electronic scanning pressure system that includes a plurality of pressure transducers is examined. A means obtains an electrical signal indicative of a pressure measurement from each of the plurality of pressure transducers. A multiplexing means is connected for selectivity supplying inputs from the plurality of pressure transducers to the signal obtaining means. A data bus connects the plurality of pressure transducers to the multiplexing means. A latch circuit is connected to supply control inputs to the multiplexing means. An address bus is connected to supply an address signal of a selected one of the plurality of pressure transducers to the latch circuit. In operation, each of the pressure transducers is successively scanned by the multiplexing means in response to address signals supplied on the address bus to the latch circuit.

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



N84-22935*# National Aeronautics and Space Administration. Pasadena Office, Calif.

INSTRUMENTATION FOR SENSING MOISTURE CONTENT OF MATERIAL USING A TRANSIENT THERMAL PULSE Patent Application

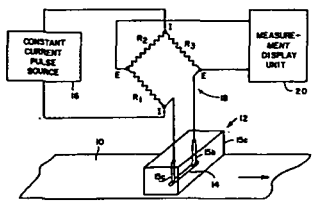
L. C. YANG, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 22 Dec. 1983 14 p

(Contract NAS7-100)

(NASA-CASE-NPO-15494-2; US-PATENT-APPL-SN-563890)

Avail: NTIS HC A02/MF A01 CSCL 14B

Instrumentation for sensing moisture content of material is described which uses a transient thermal pulse. It is comprised of a sensing probe having a sensing element in the form of a ribbon excited by a constant current pulse from a source to increase the temperature, and therefore the resistance, of the ribbon linearly. Moisture in web material limits the increase of temperature during the pulse in proportion to the moisture content. This increase in temperature produces a proportional increase in resistivity which is measured with a Wheatstone bridge as a change in voltage displayed by a measurement display unit. The probe is glued in a shallow groove of a Lucite bar and connected to copper pins embedded in the bar. A cylindrical Lucite block may be used to hold the sensing element connected to axial pins in order for the probe to roll and thus reduce its wear. NASA



N84-25015*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SPINNING DISK CALIBRATION METHOD AND APPARATUS FOR LASER DOPPLER VELOCIMETER Patent Application

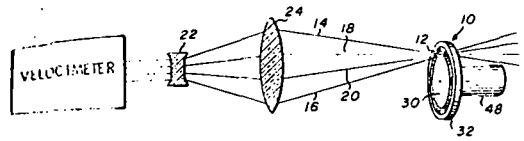
P. K. SNYDER, inventor (to NASA) 19 Apr. 1984 18 p

(NASA-CASE-ARC-11510-1; US-PATENT-APPL-SN-602049)

Avail: NTIS HC A02/MF A01 CSCL 14B

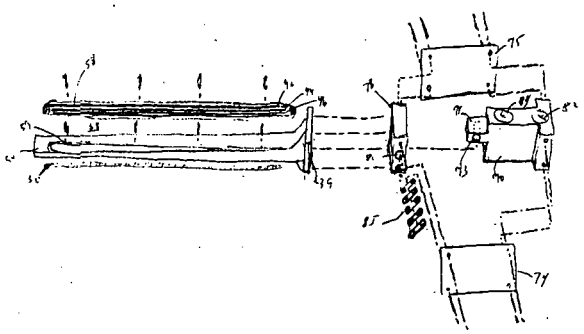
A method and apparatus for calibrating laser Doppler velocimeters having one or more intersecting beam pairs are described. These velocimeters measure fluid velocity by observing

the light scattered by particles in the fluid stream. Moving fluid particulates are simulated by fine taut wires that are radially mounted on a disk that is rotated at a known velocity. The laser beam intersections locus is first aimed at the very center of the disk and then the disk is translated so that the locus is swept by the rotating wires. The radial distance traversed is precisely measured so that the velocity of the wires (pseudo particles) may be calculated. NASA



N84-25016*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MULTISPECTRAL LINEAR ARRAY MULTIBAND SELECTION DEVICE Patent Application
H. L. RICHARD, inventor (to NASA) 2 May 1984 14 p
(NASA-CASE-GSC-12911-1; US-PATENT-APPL-SN-606426)
Avail: NTIS HC A02/MF A01 CSCL 14B

An apparatus for detecting multiple spectral bands, individually or concurrently, using linear detector arrays is described. The system employs a beamsplitter to divide the optical source into two or more optical beams which are directed at the linear detector arrays. Filter trays are positioned in the focal planes of the optical beams so that the beams pass through the filter trays prior to impinging upon the detector arrays. Multiple filters are placed on the filter trays. Linear actuators, positioned adjacent the filter trays, translate the trays across the focal planes of the optical beams. Individual bandpass filters are positioned in the path of the incoming beams so that specific beam frequencies can be detected and further analyzed. This spectral detection method can be applied in spaceborne and aerial imaging procedures. NASA



N84-28015* National Aeronautics and Space Administration. Wallops Flight Center, Wallops Island, Va.
THIN FILM STRAIN TRANSDUCER Patent
J. L. RAND, inventor (to NASA) (Southwest Research Inst., San Antonio) 17 Feb. 1984 7 p Filed 26 Feb. 1982 Supersedes N82-26632 (20 - 17, p 2405) Sponsored by NASA
(NASA-CASE-WLP-10055-1; US-PATENT-4,425,808;
US-PATENT-APPL-SN-352827; US-PATENT-CLASS-73-862.65)
Avail: US Patent and Trademark Office CSCL 14B

A strain transducer system and process for making the same is disclosed. A beryllium copper ring having four strain gages is electrically connected in Wheatstone bridge fashion to the output instrumentation. Tabs are bonded to a balloon or like surface with strain on the surface causing bending of a ring which provides an electrical signal through the gages proportional to the surface strain. A photographic pattern of a one half ring segment as placed on a sheet of beryllium copper for chem-mill etch formation is illustrated.
Official Gazette of the U.S. Patent and Trademark Office

N84-28016* National Aeronautics and Space Administration. Pasadena Office, Calif.
ION MASS SPECTROMETER Patent
M. NEUGEBAUER, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena), D. R. CLAY, B. E. GOLDSTEIN, and R. GOLDSTEIN 6 Mar. 1984 9 p Filed 24 Mar. 1982 Supersedes N82-25042 (20 - 15, p 2170) Sponsored by NASA
(NASA-CASE-NPO-15423-1; US-PATENT-4,435,642;
US-PATENT-APPL-SN-361216; US-PATENT-CLASS-250-296)
Avail: US Patent and Trademark Office CSCL 14B

An ion mass spectrometer is described which detects and indicates the characteristics of ions received over a wide angle, and which indicates the mass to charge ratio, the energy, and the direction of each detected ion. The spectrometer includes a magnetic analyzer having a sector magnet that passes ions received over a wide angle, and an electrostatic analyzer positioned to receive ions passing through the magnetic analyzer. The electrostatic analyzer includes a two dimensional ion sensor at one wall of the analyzer chamber, that senses not only the lengthwise position of the detected ion to indicate its mass to charge ratio, but also detects the ion position along the width of the chamber to indicate the direction in which the ion was traveling.
Official Gazette of the U.S. Patent and Trademark Office

N84-28017* National Aeronautics and Space Administration. Pasadena Office, Calif.
SHAFT TRANSDUCER HAVING DC OUTPUT PROPORTIONAL TO ANGULAR VELOCITY Patent
M. B. HANDLYKKEN, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 17 Apr. 1984 6 p Filed 19 Feb. 1982 Supersedes N82-26633 (20 - 17, p 2405) Sponsored by NASA
(NASA-CASE-NPO-15706-1; US-PATENT-4,443,724;
US-PATENT-APPL-SN-350475; US-PATENT-CLASS-310-171;
US-PATENT-CLASS-310-68B; US-PATENT-CLASS-310-154;
US-PATENT-CLASS-335-222) Avail: US Patent and Trademark Office CSCL 14B

A brushless dc tachometer is disclosed that includes a high strength toroidal permanent magnet for providing a uniform magnetic field in an air gap, an annular pole piece opposite the magnet, and a pickup coil wound around the pole piece and adapted to rotate about the axis of the pole piece. The pickup coil is rotated by an input shaft to which the coil is coupled with the friction clip. The output of the coil is conducted to circuitry by a twisted wire pair. The input shaft also activates a position transducing potentiometer.
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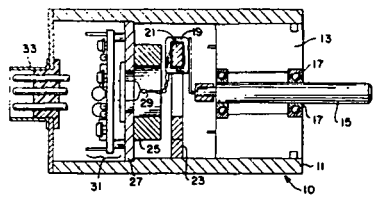

N84-28018* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DEVICE FOR DETERMINING FROST DEPTH AND DENSITY Patent
F. HUNEIDI 16 Aug. 1983 6 p Filed 18 Mar. 1982 Supersedes N82-26503 (20 - 17, p 2387)
(NASA-CASE-NFS-25754-1; US-PATENT-4,398,412; US-PATENT-APPL-SN-359626; US-PATENT-CLASS-73-32R; US-PATENT-CLASS-73-864.41; US-PATENT-CLASS-73-150R; US-PATENT-CLASS-73-170R; US-PATENT-CLASS-33-169F; US-PATENT-CLASS-62-128) Avail: US Patent and Trademark Office CSCL 14B

A hand held device having a forward open window portion adapted to be pushed downwardly into the frost on a surface, and a rear container portion adapted to receive the frost removed from the window area are described. A graph on a side of the container enables an observer to determine the density of the frost from certain measurements noted. The depth of the frost is noted from calibrated lines on the sides of the open window portion.

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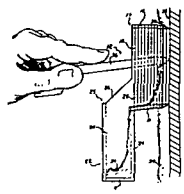

N84-28019* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STRAIN GAGE CALIBRATION Patent
T. C. MOORE, inventor (to NASA) 24 Jan. 1984 9 p Filed 27 Apr. 1982 Supersedes N82-32661 (20 - 23, p 3284)
(NASA-CASE-LAR-12743-1; US-PATENT-4,426,874; US-PATENT-APPL-SN-372279; US-PATENT-CLASS-73-1B; US-PATENT-CLASS-374-1) Avail: US Patent and Trademark Office CSCL 14B

A temporary bonding system for accurately predetermining the individual apparent strain curve characteristics of the gages is used, and subsequently employs a computer to watch the apparent strain curves of the individual gages to determine which gages should be used together on transducers. The temporary bonding system requires a test block on which the gages are temporarily bonded, several thermocouples for monitoring temperature, and a data acquisition system for recording apparent strain data. Initially, a group of strain gages are attached to the test block using a bonding agent that disintegrates at high temperatures. The gages are then wired to an appropriate data acquisition and data, collected throughout a predetermined temperature excursion. Once the data is obtained, the test block is heated until the bonding agent disintegrates freeing the gages from the test block. The gages are then disconnected from the data acquisition system and cleaned, thereby ready for use on transducers.

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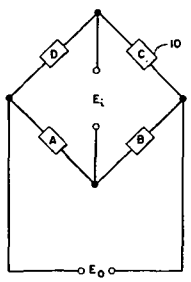
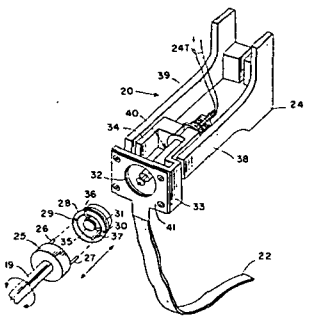


N84-29191*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PRECISION MANIPULATOR HEATING AND COOLING APPARATUS FOR USE IN UHV SYSTEMS WITH SAMPLE TRANSFER CAPABILITY Patent Application
R. A. OUTLAW and B. T. BAUGH, inventors (to NASA) 31 Oct. 1983 11 p
(NASA-CASE-LAR-13040-1; US-PATENT-APPL-SN-547176)
Avail: NTIS HC A02/MF A01 CSCL 14B

An improvement of a precision manipulator for use in Ultra High Vacuum (UHV) systems with sample transfer capability in which a spring loaded thermocouple and a heater electrode are both in direct contact with the transferred sample is described. The thermocouple and heater electrode assembly are mounted concentrically with a sample receiving block on the end of an offset manipulator. When a sample is transferred from an introduction chamber into the UHV chamber, it contacts the spring loaded thermocouple and then seats a heater electrode. Cooling by a copper plate and a strap combined with the resistance heating capability allow sample temperatures over the range of 150-1750 K while positioned in front of any diagnostic instrument in the UHV system and while taking data with these instruments.

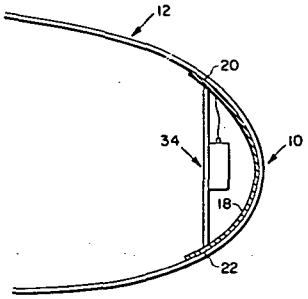
NASA



N84-32782*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PIEZOELECTRIC DEICING DEVICE Patent Application
R. FINKE and B. BANKS, inventors (to NASA) 7 Aug. 1984 9 p Continuation of US-Patent-Appl-SN-469867, filed 25 Feb. 1983
(NASA-CASE-LEW-13773-2; NAS 1.71:LEW-13773-2; US-PATENT-APPL-SN-638541) Avail: NTIS HC A02/MF A01 CSCL 14B

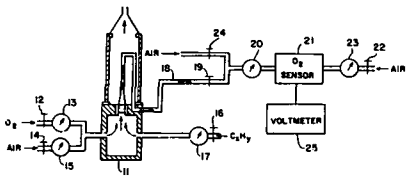
A fast voltage pulse is applied to a transducer which comprises a composite of multiple layers of alternately polarized piezoelectric material. These layers are bonded together and positioned over the curved leading edge of an aircraft wing structure. Each layer is relatively thin and metallized on both sides. The strain produced in the transducer causes the composite to push forward resulting in detachment and breakup of ice on the leading edge of the aircraft wing.

NASA



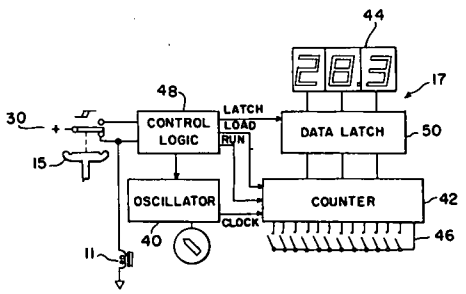
N84-32786*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
TECHNIQUE FOR MEASURING GAS CONVERSION FACTORS Patent Application
J. J. SINGH, inventors (to NASA) and D. R. SPRINKLE 23 Jul. 1984 12 p
(NASA-CASE-LAR-13220-1; NAS 1.71:LAR-13220-1; US-PATENT-APPL-SN-633179) Avail: NTIS HC A02/MF A01 CSCL 14B

A method for determining hydrocarbon conversion factors for a flowmeter is described. A mixture of air, O2 and C(x)H(y) is burned and the partial pressure of the O2 in the resulting gas is forced to equal the partial pressure of O2 in the air. The flow rate of the O2 flowing into the mixture is measured and the flow rate of C(x)H(y) flowing into the mixture is measured. These measured values are used to calculate the conversion factors F = O2 flow rate/(m/n)x reading on the dial of the flowmeter where m/n is calculated in the product gas for the hydrocarbon C(x)H(y) with the assumption that the mole fraction of oxygen in the product gas is the same as the air. Author



N84-32787*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
VOLUMETRIC FUEL QUANTITY GAUGE Patent Application
H. D. GARNER and W. E. HOWELL, inventors (to NASA) 23 Aug. 1984 11 p
(NASA-CASE-LAR-13147-1; NAS 1.71:LAR-13147-1; US-PATENT-APPL-SN-643523) Avail: NTIS HC A02/MF A01 CSCL 14B

A method and apparatus to determine the volume of fuel remaining in a reservoir regardless of the attitude, shape, or agitation of the fuel is described. The pressure in the reservoir is continuously cycled between two preselected pressure levels as determined by a pressure sensitive switch. The time required to effect the pressure change between the preselected levels is measured by a timer apparatus and is indicative of the volume of fuel remaining in the reservoir. NASA



N84-33765* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
IMAGING X-RAY SPECTROMETER Patent
P. A. GRANT, J. W. JACKSON, JR., G. E. ALCORN, and F. E. MARSHALL, inventors (to NASA) 18 Sep. 1984 6 p Filed 19 Feb. 1982 Supersedes N82-26629 (20 - 17, p 2404)
(NASA-CASE-GSC-12682-1; NAS 1.71:GSC-12682-1; US-PATENT-4,472,728; US-PATENT-APPL-SN-350477; US-PATENT-CLASS-357-30; US-PATENT-CLASS-357-29; US-PATENT-CLASS-357-32; US-PATENT-CLASS-250-385; US-PATENT-CLASS-250-367; US-PATENT-CLASS-250-483.1) Avail: US Patent and Trademark Office CSCL 14B

An X-ray spectrometer for providing imaging and energy resolution of an X-ray source is described. This spectrometer is comprised of a thick silicon wafer having an embedded matrix or grid of aluminum completely through the wafer fabricated, for example, by thermal migration. The aluminum matrix defines the walls of a rectangular array of silicon X-ray detector cells or pixels. A thermally diffused aluminum electrode is also formed centrally through each of the silicon cells with biasing means being connected to the aluminum cell walls and causes lateral charge carrier depletion between the cell walls so that incident X-ray energy causes a photoelectric reaction within the silicon producing collectible charge carriers in the form of electrons which are collected and used for imaging.
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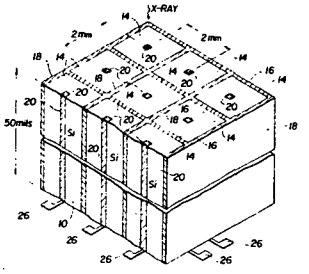
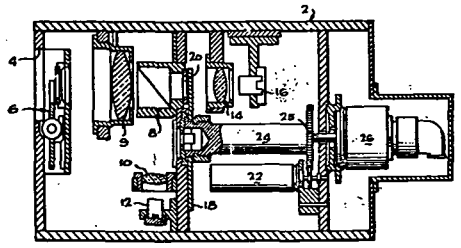


N84-33766* National Aeronautics and Space Administration. Pasadena Office, Calif.
PORTABLE REFLECTANCE SPECTROMETER Patent
A. F. H. GOETZ (JPL, California Inst. of Tech., Pasadena), R. A. GRAHAM (JPL, California Inst. of Tech., Pasadena), and T. OZAWA, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 23 Aug. 1977 9 p Filed 24 Mar. 1975 Sponsored by NASA
(NASA-CASE-NPO-13556-1; NAS 1.71:NPO-13556-1; US-PATENT-4,043,668; US-PATENT-APPL-SN-561369; US-PATENT-CLASS-356-73; US-PATENT-CLASS-250-339; US-PATENT-CLASS-356-74; US-PATENT-CLASS-356-188; US-PATENT-CLASS-356-189) Avail: US Patent and Trademark Office CSCL 14B

A portable reflectance spectrometer is disclosed. The spectrometer essentially includes an optical unit and an electronic recording unit. The optical unit includes a pair of thermoelectrically-cooled detectors, for detecting total radiance and selected radiance projected through a circular variable filter wheel, and is capable of operating to provide spectral data in the range 0.4 to 2.5 micrometers without requiring coventional substitution of filter elements. The electronic recording unit includes power supplies, amplifiers, and digital recording electronics designed to

permit recordation of data on tape casettes. Both the optical unit and electronic recording unit are packaged to be manually portable. NASA



N84-33767* National Aeronautics and Space Administration. Pasadena Office, Calif.

MEANS AND METHOD FOR CALIBRATING A PHOTON DETECTOR UTILIZING ELECTRON-PHOTON COINCIDENCE Patent

S. K. SRIVASTAVA, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 4 Sep. 1984 9 p Filed 15 Mar. 1982 Supersedes N82-24953 (20 - 15, p 2154) Sponsored by NASA (NASA-CASE-NPO-15644-1; NAS 1.71:NPO-15644-1; US-PATENT-4,469,942; US-PATENT-APPL-SN-358088; US-PATENT-CLASS-250-252.1; US-PATENT-CLASS-250-251; US-PATENT-CLASS-250-372) Avail: US Patent and Trademark Office CSCL 14B

An arrangement for calibrating a photon detector particularly applicable for the ultraviolet and vacuum ultraviolet regions is based on electron photon coincidence utilizing crossed electron beam atom beam collisions. Atoms are excited by electrons which lose a known amount of energy and scatter with a known remaining energy, while the excited atoms emit photons of known radiation. Electrons of the known remaining energy are separated from other electrons and are counted. Photons emitted in a direction related to the particular direction of scattered electrons are detected to serve as a standard. Each of the electrons is used to initiate the measurements of a time interval which terminates with the arrival of a photon exciting the photon detector. Only the number of time intervals related to the coincidence correlation and of electrons scattered in the particular direction with the known remaining energy and photons of a particular radiation level emitted due to the collisions of such scattered electrons are counted. The detector calibration is related to the number of counted electrons and photons.

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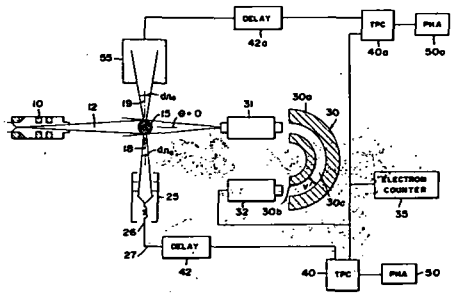
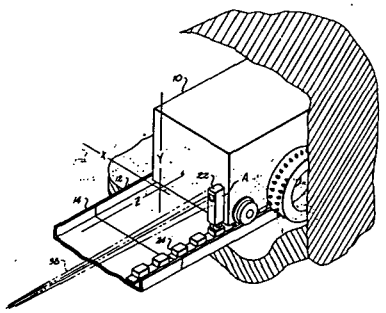


N84-33768* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

LONGWALL SHEARER TRACKING SYSTEM Patent

P. D. POULSEN, inventor (to NASA) (Adjunct Systems, Inc.), R. J. STEIN, and R. E. PEASE 21 Aug. 1984 13 p Filed 15 Nov. 1982 Supersedes N83-14607 (21 - 05, p 0692) Sponsored by NASA (NASA-CASE-MFS-25717-1; NAS 1.71:MFS-25717-1; US-PATENT-4,466,667; US-PATENT-APPL-SN-441897; US-PATENT-CLASS-299-1; US-PATENT-CLASS-175-45) Avail: US Patent and Trademark Office CSCL 14B

A tracking system for measuring and recording the movements of a longwall shearer vehicle includes an optical tracking assembly carried at one end of a desired vehicle path and a retroreflector assembly carried by the vehicle. Continuous horizontal and vertical light beams are alternately transmitted by means of a rotating Dove prism to the reflector assembly. A vertically reciprocating reflector interrupts the continuous light beams and converts these to discrete horizontal and vertical light beam images transmitted at spaced intervals along the path. A second rotating Dove prism rotates the vertical images to convert them to a second series of horizontal images while the first mentioned horizontal images are left unrotated and horizontal. The images are recorded on a film. NASA

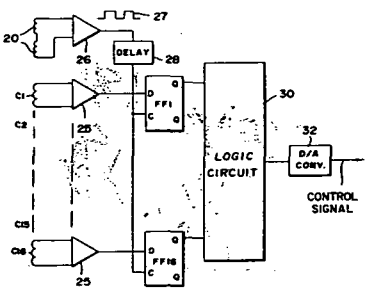


N84-33769* National Aeronautics and Space Administration. Pasadena Office, Calif.

PHASE SENSITIVE GUIDANCE SENSOR FOR WIRE-FOLLOWING VEHICLES Patent

G. R. HANSEN, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 18 Sep. 1984 7 p Filed 30 Oct. 1981 Supersedes N82-12346 (20 - 03, p 0333) Sponsored by NASA (NASA-CASE-NPO-15341-1; NAS 1.71:NPO-15341-1; US-PATENT-4,472,716; US-PATENT-APPL-SN-315583; US-PATENT-CLASS-340-905; US-PATENT-CLASS-180-168; US-PATENT-CLASS-318-587; US-PATENT-CLASS-340-988) Avail: US Patent and Trademark Office CSCL 14B

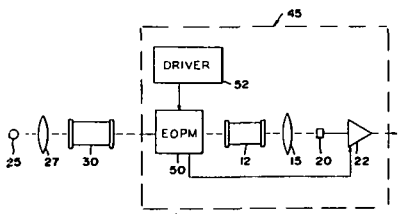
A guidance sensor for a wire-following vehicle which is phase sensitive, includes an array of coils positioned to sense the vertical component of a magnetic field produced by the ac current through the guidance wire. The outputs of the coils are fed to associated flip flops. Flip flops associated with coils, through which flux passes in one direction, e.g., up, are driven to one state, e.g., true, and flip flops associated with coils through which flux passes in the opposite direction, e.g., down, are driven to a false state. The control signal to guide the vehicle over the wire is a function of the number of flip flops in the true state. Circuitry is included to prevent flip flops from assuming a wrong state due to noise. NASA



N84-34705* National Aeronautics and Space Administration. Pasadena Office, Calif.
CORRELATION SPECTROMETER HAVING HIGH RESOLUTION AND MULTIPLEXING CAPABILITY Patent
J. S. MARGOLIS (JPL, California Inst. of Tech., Pasadena) and J. V. MARTONCHIK, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 2 Oct. 1984 8 p Filed 30 Apr. 1982 Supersedes N82-26636 (17 - 20, p 2405) Sponsored by NASA (NASA-CASE-NPO-15558-1; NAS 1.71:NPO-15558-1; US-PATENT-4,474,471; US-PATENT-APPL-SN-373770; US-PATENT-CLASS-356-434; US-PATENT-CLASS-250-343; US-PATENT-CLASS-250-351; US-PATENT-CLASS-356-51)
Avail: US Patent and Trademark Office CSCL 14B

A correlation spectrometer permanently incorporates a reference cell and an electro-optical phase modulator (EOPM) in the light path between a sample cell and a detector. The effect of the EOPM is such that its frequency modulates all of the monochromatic component of the incoherent radiation passing through it. The EOPM is adjusted so that when it is ON all of the energy in the monochromatic components is thrown into sidebands *differing from the original frequencies by integral multiples of the* modulation frequency with the total amount of energy absorbed from the original radiation remaining constant. When there is no coincidence between the constituents in the two cells, the detector's output is the same when the EOPM is ON and when it is OFF. However, when there is coincidence the detector's output changes when the EOPM is switched between its two states. The change in the detector's output is related to the quantity of the constituents in the sample cell.

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



36

LASERS AND MASERS

Includes parametric amplifiers.

N84-22943* National Aeronautics and Space Administration. Pasadena Office, Calif.
SPECTROPHONE STABILIZED LASER WITH LINE CENTER OFFSET FREQUENCY CONTROL Patent
M. J. KAVAYA (California Inst. of Tech., Pasadena) and R. T. MENZIES, inventors (to NASA) (California Inst. of Tech., Pasadena) 28 Feb. 1984 14 p Filed 31 Mar. 1982 Sponsored by NASA
(NASA-CASE-NPO-15516-1; US-PATENT-4,434,490; US-PATENT-APPL-SN-364126; US-PATENT-CLASS-372-20; US-PATENT-CLASS-372-28; US-PATENT-CLASS-372-32) Avail: US Patent and Trademark Office CSCL 20E

Continuous offset tuning of a frequency stabilized CW gas laser is achieved by using a spectrophone filled with the same gas as the laser for sensing a dither modulation, detecting a first or second derivative of the spectrophone output with a lock-in amplifier, the detected output of which is integrated, and applying the integrator output as a correction signal through a circuit which adds to the dither signal from an oscillator a dc offset that is adjusted with a potentiometer to a frequency offset from the absorption line center of the gas, but within the spectral linewidth of the gas. Tuning about that offset frequency is achieved by adding a dc value to the detected output of the dither modulation before integration using a potentiometer.

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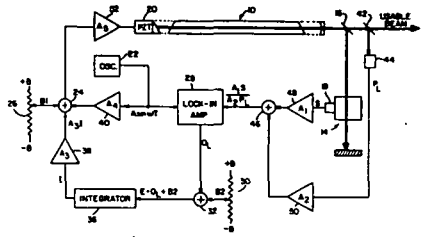

N84-22944* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD AND APPARATUS FOR COATING SUBSTRATES USING A LASER Patent
I. ZAPLATYNSKY, inventor (to NASA) 28 Feb. 1984 5 p Filed 15 Mar. 1982
(NASA-CASE-LEW-13526-1; US-PATENT-4,434,189; US-PATENT-APPL-SN-358398; US-PATENT-CLASS-427-53.1; US-PATENT-CLASS-118-50.1; US-PATENT-CLASS-118-624; US-PATENT-CLASS-118-641; US-PATENT-CLASS-427-399)
Avail: US Patent and Trademark Office CSCL 20E

Metal substrates, preferably of titanium and titanium alloys, are coated by alloying or forming TiN on a substrate surface. A laser beam strikes the surface of a moving substrate in the presence of purified nitrogen gas. A small area of the substrate surface is quickly heated without melting. This heated area reacts with the nitrogen to form a solid solution. The alloying or formation of TiN occurs by diffusion of nitrogen into the titanium. Only the surface layer of the substrate is heated because of the high power density of the laser beam and short exposure time. The bulk of the substrate is not affected, and melting of the substrate is avoided because it would be detrimental.

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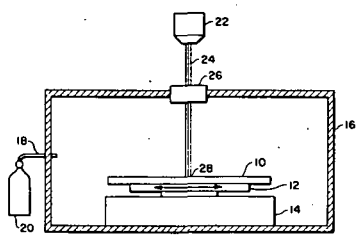
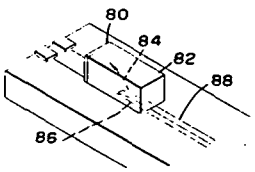


N84-25037*# National Aeronautics and Space Administration. Pasadena Office, Calif.
LASER PULSE DETECTION METHOD AND APPARATUS Patent Application
W. GOSS (JPL, California Inst. of Tech., Pasadena) and J. R. JANESICK, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 22 Feb. 1984 17 p
(Contract NAS7-100)
(NASA-CASE-NPO-16030-1; US-PATENT-APPL-SN-582494)
Avail: NTIS HC A02/MF A01 CSCL 20E

A sensor is described for detecting the difference in phase of a pair of returned light pulse components, such as two components of a light pulse of an optical gyro. In an optic gyro, the two light components have passed in opposite directions through a coil of optical fiber, with the difference in phase of the returned light

components determining the intensity of light shining on the sensor. The sensor includes a CCD (charge coupled device) that receives the pair of returned light components to generate a charge proportional to the number of photons in the received light. The amount of the charge represents the phase difference between the two light components. At a time after the transmission of the light pulse and before the expected time of arrival of the interfering light components, charge accumulating in the CCD as a result of reflections from components in the system, are repeatedly removed from the CCD, by transferring out charges in the CCD and dumping these charges. NASA



N84-28065* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

OFF-AXIS COHERENTLY PUMPED LASER Patent

G. A. KOEPF, inventor (to NASA) (Phoenix Corp., McLean, Va.) 1 May 1984 9 p Filed 23 Oct. 1980 Supersedes N81-12407 (19 - 03, p 3049) Sponsored by NASA
(NASA-CASE-GSC-12592-1; US-PATENT-4,446,556; US-PATENT-APPL-SN-199766; US-PATENT-CLASS-372-4; US-PATENT-CLASS-372-71; US-PATENT-CLASS-372-93; US-PATENT-CLASS-372-95; US-PATENT-CLASS-372-103)
Avail: US Patent and Trademark Office CSCL 20E

A coherently optically pumped laser system is described. A pump laser beam propagates through a laser medium contained in a degenerate cavity resonator in a controlled multiple round trip fashion in such a way that the unused pump beam emerges from an injection aperture at a different angle from which it enters the resonator. The pump beam is angularly injected off of the central axis of the resonator body whereupon the pump beam alternately undergoes spreading and focusing while pumping the laser medium by a process of resonant absorption. The emergent pump beam can also be used as a second pump beam source by being reinjected back into the cavity or it can be used for pumping another laser.

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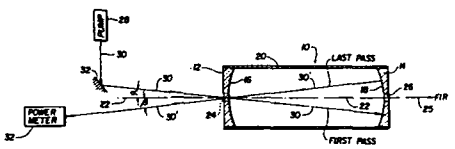

37

MECHANICAL ENGINEERING

Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

N84-22957* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

METHOD OF FABRICATING AN ABRADABLE GAS PATH SEAL Patent

R. C. BILL and D. W. WISANDER, inventors (to NASA) 7 Feb. 1984 6 p Filed 30 Sep. 1982 Division of US Patent No. 4,377,371, US Patent Appl. SN-242795, filed 11 Mar. 1981
(NASA-CASE-LEW-13269-2; US-PATENT-4,430,360; US-PATENT-4,377,371; US-PATENT-APPL-SN-431448; US-PATENT-APPL-SN-242795; US-PATENT-CLASS-427-34; US-PATENT-CLASS-415-174; US-PATENT-CLASS-427-53.1; US-PATENT-CLASS-427-423; US-PATENT-CLASS-428-155)
Avail: US Patent and Trademark Office CSCL 11A

The thermal shock resistance of a ceramic layer is improved. The invention is particularly directed to an improved abradable lining that is deposited on shroud forming a gas path in turbomachinery. Improved thermal shock resistance of a shroud is effected through the deliberate introduction of benign cracks. These are microcracks which will not propagate appreciably upon exposure to the thermal shock environment in which a turbine seal must function. Laser surface fusion treatment is used to introduce these microcracks. The ceramic surface is laser scanned to form a continuous dense layer. As this layer cools and solidifies, shrinkage results in the formation of a very fine crack network. The presence of this deliberately introduced fine crack network precludes the formation of a catastrophic crack during thermal shock exposure.

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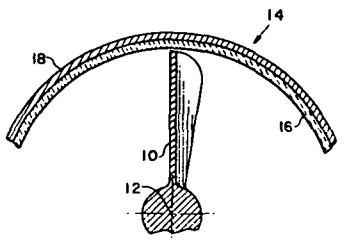

N84-22958* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

HEAT PIPES TO REDUCE ENGINE EXHAUST EMISSIONS Patent

D. F. SCHULTZ, inventor (to NASA) 7 Feb. 1984 8 p Filed 30 Jan. 1981
(NASA-CASE-LEW-12590-1; US-PATENT-4,429,537; US-PATENT-APPL-SN-229693; US-PATENT-CLASS-60-730; US-PATENT-CLASS-60-736) Avail: US Patent and Trademark Office CSCL 21A

A fuel combustor is presented that consists of an elongated casing with an air inlet conduit portion at one end, and having an opposite exit end. An elongated heat pipe is mounted longitudinally in the casing and is offset from and extends alongside the combustion space. The heat pipe is in heat transmitting relationship with the air intake conduit for heating incoming air. A guide conduit structure is provided for conveying the heated air from the intake conduit into the combustion space. A fuel discharge nozzle is provided to inject fuel into the combustion space. A fuel conduit from a fuel supply source has a portion engaged in heat transfer relationship of the heat pipe for preheating the fuel. The downstream end of the heat pipe is in heat transfer relationship with the casing and is located adjacent to the downstream end of the combustion space. The offset position of the heat pipe relative to the combustion space minimizes the quenching effect of the heat pipe on the gaseous products of combustion, as well as

reducing coking of the fuel on the heat pipe, thereby improving the efficiency of the combustor.
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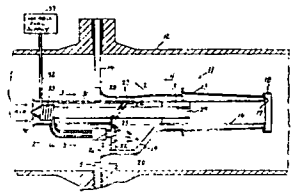
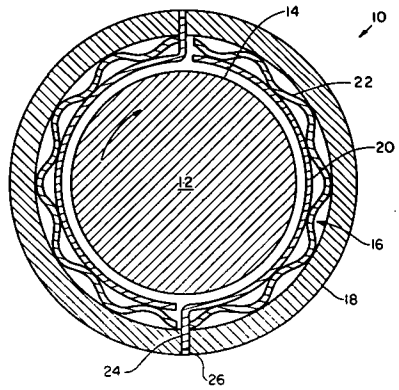


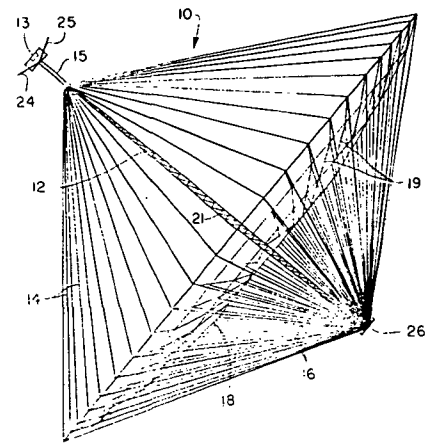
N84-22959*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IMPROVED COMPLIANT HYDRODYNAMIC FLUID JOURNAL BEARING Patent Application
E. L. WARREN, inventor (to NASA) 2 Apr. 1984 11 p
(NASA-CASE-LEW-13670-1; US-PATENT-APPL-SN-603374)
Avail: NTIS HC A02/MF A01 CSCL 13I

An arc heating structure is described that prevents destructive bending moments within the top foil. Welds are eliminated by mounting the top bearing foil in the bearing cartridge sleeve without using a space block. Tabs or pins at the end of the top bearing foil are restrained by slots or stops formed in the cartridge sleeve. These structural members are free to move in a direction normal to the shaft while being restrained from movement in the direction of shaft rotation. NASA



N84-25063*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LATCHING MECHANISM FOR DEPLOYABLE-RESTOWABLE COLUMNS Patent Application
E. L. AHL, JR., inventor (to NASA) 2 May 1984 21 p
(NASA-CASE-LAR-13169-1; US-PATENT-APPL-SN-606431)
Avail: NTIS HC A02/MF A01 CSCL 13I

A column longeron latch assembly provides the securing mechanism for the deployable, telescoping column of a hoop/column antenna. The column is an open lattice structure with three longerons disposed 120 deg apart as the principle load bearing member and is deployed from a pair of eleven nested bays disposed on opposite sides of a center section under the influence of a motor-cable-pulley system. The longeron latch is a four bar linkage mechanism using the over-center principle for automatically looking the longeron sections into position during deployment and serves to unlock the sections when antenna 10 is to be re-stowed. A spring pack, disposed in an end of each longeron, serves to absorb stress forces on the deployed column throught the cam head piston and the abutting latch from an adjacent longeron. NASA



N84-28081* National Aeronautics and Space Administration. Pasadena Office, Calif.
CENTRIFUGAL-RECIPROCATING COMPRESSOR
W. H. HIGA, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 22 May 1984 14 p Filed 23 Jul. 1982 Supersedes N83-29708 (21 - 18, 2947) Continuation-in-part of US Patent Application SN-037194, filed 8 May 1979 Sponsored by NASA
(NASA-CASE-NPO-14597-2; US-PATENT-4,449,894;
US-PATENT-APPL-SN-401288; US-PATENT-APPL-SN-037194;
US-PATENT-CLASS-417-328; US-PATENT-CLASS-417-392;
US-PATENT-CLASS-417-462) Avail: US Patent and Trademark Office CSCL 13I

A centrifugal compressor is described which includes at least one pair of cylinders arranged in coaxial alignment and supported for angular displacement about a common axis of rotation normally disecting a common longitudinal axis of symmetry for the cylinders. The cylinders are characterized by ported closures located at the mutually remote ends thereof through which the cylinders are charged and discharged, and a pair of piston heads seated within the cylinders and supported for floating displacement in compressive strokes in response to unidirectional angular displacement imparted to the cylinders.
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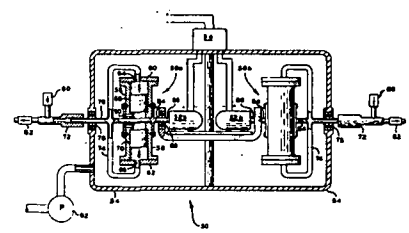

N84-28082* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
APPARATUS FOR AND METHOD OF COMPENSATING

DYNAMIC UNBALANCE Patent
J. A. HRASTAR, inventor (to NASA) 10 Jul. 1984 13 p Filed 27 Feb. 1981 Supersedes N81-22358 (19 - 13, p 1762)
(NASA-CASE-GSC-12550-1; US-PATENT-4,458,554; US-PATENT-APPL-SN-238888; US-PATENT-CLASS-74-573R; US-PATENT-CLASS-74-5.5; US-PATENT-CLASS-73-468) Avail: US Patent and Trademark Office CSCL 13I

An apparatus to stabilize a fine platform that carries a parabolic reflecting dish, utilized in connection with the large aperture, multichannel microwave radiometer, is discussed. It provides compensation for dynamic unbalance imparted to a fixed body by a shaft about which the rotating body rotates. Force components exerted on the fixed body by the rotating body in a plane at right angles to the axis are determined. In response to the determined force components, the rotational speed and effective direction of mass means mounted on the rotating body are controlled. The mass means has an effective axis of rotation in a plane at right angles to the longitudinal axis.

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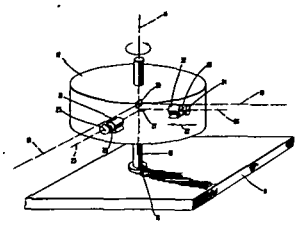

N84-28083* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
WORKPIECE POSITIONING VISE Patent
F. C. HALLBERG and C. J. MORGAN, inventors (to NASA) 15 May 1984 8 p Filed 31 Mar. 1982 Supersedes N82-29604 (20 - 20, p 2833)
(NASA-CASE-GSC-12762-1; US-PATENT-4,448,408; US-PATENT-APPL-SN-364094; US-PATENT-CLASS-269-224; US-PATENT-CLASS-269-242; US-PATENT-CLASS-269-244; US-PATENT-CLASS-269-252; US-PATENT-CLASS-269-285)
Avail: US Patent and Trademark Office CSCL 13I

A pair of jaw assemblies simultaneously driven in opposed reciprocation by a single shaft has oppositely threaded sections to automatically center delicate or brittle workpieces such as lithium fluoride crystal beneath the blade of a crystal cleaving machine. Both jaw assemblies are suspended above the vise bed by a pair of parallel guide shafts attached to the vise bed. Linear rolling bearings, fitted around the guide shafts and firmly held by opposite ends of the jaw assemblies, provide rolling friction between the guide shafts and the jaw assemblies. A belleville washer at one end of the drive shaft and thrust bearings at both drive shaft ends hold the shaft in compression between the vise bed, thereby preventing wobble of the jaw assemblies due to wear between the shaft and vise bed.

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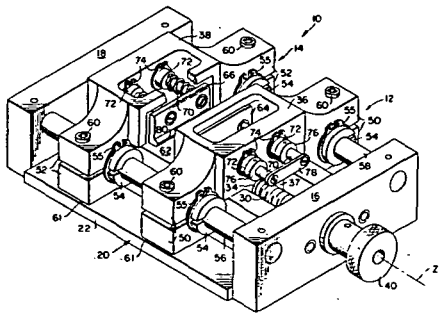

N84-28084* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DIRECTIONAL GEAR RATIO TRANSMISSIONS Patent
A. E. LAFEVER, inventor (to NASA) (Rockwell International Corp., Downey, Calif.) 8 May 1984 9 p Filed 11 Jun. 1982 Supersedes N82-29605 (20 - 20, p 2833) Sponsored by NASA
(NASA-CASE-LAR-12644-1; US-PATENT-4,446,757; US-PATENT-APPL-SN-387728; US-PATENT-CLASS-74-758; US-PATENT-CLASS-74-753; US-PATENT-CLASS-74-812) Avail: US Patent and Trademark Office CSCL 13I

Epicyclic gear transmissions which transmit output at a gear ratio dependent only upon the input's direction are considered. A transmission housing envelops two epicyclic gear assemblies, and has shafts extending from it. One shaft is attached to a sun gear within the first epicyclic gear assembly. Planet gears are held symmetrically about the sun gear by a planet gear carrier and are in mesh with both the sun gear and a ring gear. Two unidirectional clutches restrict rotation of the first planet gear carrier and ring gear to one direction. A connecting shaft drives a second sun gear at the same speed and direction as the first planet gear carrier while a connecting portion drives a second planet gear carrier at the same speed and direction as the first ring gear. The transmission's output is then transmitted by the second ring gear to the second shaft. Input is transmitted at a higher gear ratio and lower speed for all inputs in the first direction than in the opposite direction.

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N84-28085* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
TUBING AND CABLE CUTTING TOOL Patent
D. D. MCSMITH and J. I. RICHARDSON, inventors (to NASA) 10 Jul. 1984 6 p Filed 6 Oct. 1981 Supersedes N82-20545 (20 - 11, p 1515)
(NASA-CASE-LAR-12786-1; US-PATENT-4,458,418; US-PATENT-APPL-SN-309292; US-PATENT-CLASS-30-228; US-PATENT-CLASS-30-180; US-PATENT-CLASS-30-188; US-PATENT-CLASS-30-272R; US-PATENT-CLASS-30-249)
Avail: US Patent and Trademark Office CSCL 13I

A hand held hydraulic cutting tool was developed which is particularly useful in deactivating ejection seats in military aircraft rescue operations. The tool consists primarily of a hydraulic system composed of a fluid reservoir, a pumping piston, and an actuator piston. Mechanical cutting jaws are attached to the actuator piston rod. The hydraulic system is controlled by a pump handle. As the pump handle is operated the actuator piston rod is forced outward and thus the cutting jaws are forced together. The frame of the device is a flexible metal tubing which permits easy positioning of the tool cutting jaws in remote and normally inaccessible locations. Bifurcated cutting edges ensure removal of a section of the tubing or cable to thereby reduce the possibility of accidental reactivation of the tubing or cable being severed.

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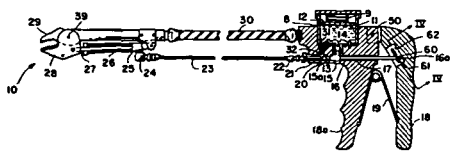
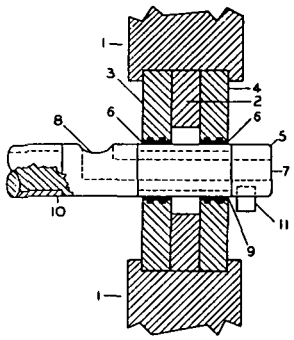


N84-32823*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
LINEAR MOTION VALVE Patent Application
J. A. CHANDLER, inventor (to NASA) 31 Jul. 1984 10 p
(NASA-CASE-MSC-20148-1; NAS 1.71:MSC-20148-1;

US-PATENT-APPL-SN-636465) Avail: NTIS HC A02/MF A01 CSCL 13K

A linear motion valve is provided. The valve spool employs magnetically permeable rings, spaced apart axially, which engage a sealing assembly having magnetically permeable pole pieces in magnetic relationship with a magnet. The gap between the ring and the pole pieces is sealed with a ferrofluid. Depletion of the ferrofluid is minimized. NASA



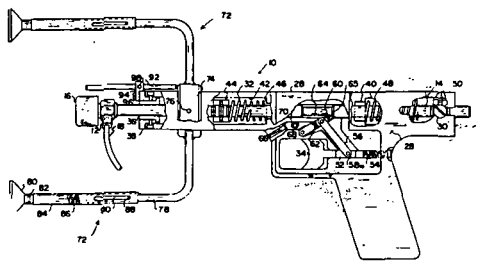
N84-33807* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

IMPACTING DEVICE FOR TESTING INSULATION Patent

J. W. REDMON, inventor (to NASA) 11 Sep. 1984 10 p Filed 24 Jan. 1983

(NASA-CASE-MFS-25862-2; NAS 1.71:MFS-25862-2; US-PATENT-4,470,293; US-PATENT-APPL-SN-460509; US-PATENT-CLASS-73-12; US-PATENT-CLASS-73-588) Avail: US Patent and Trademark Office CSCL 13I

An electro-mechanical impacting device for testing the bonding of foam insulation to metal is descirbed. The device lightly impacts foam insulation attached to metal to determine whether the insulation is properly bonded to the metal and to determine the quality of the bond. A force measuring device, preferably a load cell mounted on the impacting device, measures the force of the impact and the duration of the time the hammer head is actually in contact with the insulation. The impactor is designed in the form of a handgun having a driving spring which can propel a plunger forward to cause a hammer head to impact the insulation. The device utilizes a trigger mechanism which provides precise adjustements, allowing fireproof operation. NASA



N84-33808* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

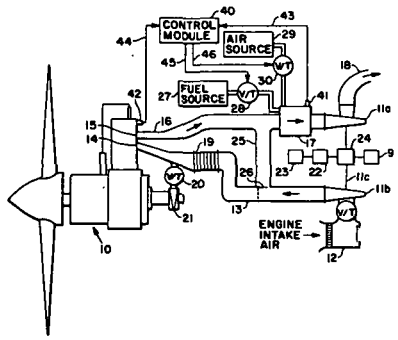
DIESEL ENGINE CATALYTIC COMBUSTOR SYSTEM Patent

L. W. REAM, inventor (to NASA) 22 May 1984 7 p Filed 6 Jun. 1980 Supersedes N80-26659 (18 - 17, p 2274)

(NASA-CASE-LEW-12995-1; NAS 1.71:LEW-12995-1; US-PATENT-4,449,370; US-PATENT-APPL-SN-157150; US-PATENT-CLASS-60-606; US-PATENT-CLASS-60-303) Avail: US Patent and Trademark Office CSCL 20A

A low compression turbocharged diesel engine is provided in which the turbocharger can be operated independently of the engine to power auxiliary equipment. Fuel and air are burned in a catalytic combustor to drive the turbine wheel of turbine section which is initially caused to rotate by starter motor. By opening a flapper value, compressed air from the blower section is directed to catalytic combustor when it is heated and expanded, serving to drive the turbine wheel and also to heat the catalytic element. To start, engine valve is closed, combustion is terminated in catalytic combustor, and the valve is then opened to utilize air from the blower for the air driven motor. When the engine starts, the constituents in its exhaust gas react in the catalytic element and the heat generated provides additional energy for the turbine section.

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



43

EARTH RESOURCES

Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.

N84-23012*# National Aeronautics and Space Administration. Pasadena Office, Calif.

OIL SHALE EXTRACTION USING SUPER-CRITICAL EXTRACTION Patent Application

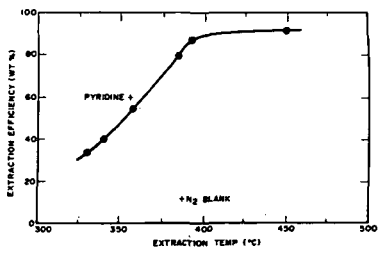
L. E. COMPTON, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 17 Nov. 1983 25 p

(Contract NAS7-100)

(NASA-CASE-NPO-15656-1; US-PATENT-APPL-SN-569370)

Avail: NTIS HC A02/MF A01 CSCL 08I

Significant improvement in oil shale extraction under supercritical conditions is provided by extracting the shale at a temperature below 400 C, such as from about 250 C to about 350 C, with a solvent having a Hildebrand solubility parameter within 1 to 2 Hb of the solubility parameter for oil shale bitumen. NASA



44

ENERGY PRODUCTION AND CONVERSION

Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.

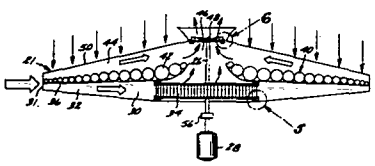
N84-23018* National Aeronautics and Space Administration. Pasadena Office, Calif.

WIND AND SOLAR POWERED TURBINE Patent

I. D. WELLS (California Inst. of Tech., Pasadena), J. L. KOH (California Inst. of Tech., Pasadena), and M. HOLMES, inventors (to NASA) (California Inst. of Tech., Pasadena) 28 Feb. 1984 10 p Filed 19 May 1982 Sponsored by NASA (NASA-CASE-NPO-15496-1; US-PATENT-4,433,544; US-PATENT-APPL-SN-379602; US-PATENT-CLASS-60-641.12; US-PATENT-CLASS-60-698; US-PATENT-CLASS-60-716; US-PATENT-CLASS-290-55; US-PATENT-CLASS-415-2R; US-PATENT-CLASS-415-DIG.8) Avail: US Patent and Trademark Office CSCL 10A

A power generating station having a generator driven by solar heat assisted ambient wind is described. A first plurality of radially extendng air passages direct ambient wind to a radial flow wind turbine disposed in a centrally located opening in a substantially disc-shaped structure. A solar radiation collecting surface having black bodies is disposed above the fist plurality of air passages and in communication with a second plurality of radial air passages. A cover plate enclosing the second plurality of radial air passages is transparent so as to permit solar radiation to effectively reach the black bodies. The second plurality of air passages direct ambient wind and thermal updrafts generated by the black bodies to an axial flow turbine. The rotating shaft of the turbines drive the generator. The solar and wind drien power generating system operates in electrical cogeneration mode with a fuel powered prime mover.

Official Gazette of the U.S. Patent and Trade mark Office



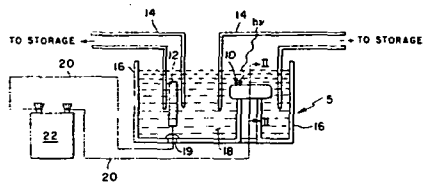
N84-23019* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PHOTOELECTROCHEMICAL CELLS INCLUDING CHALCOGENOPHOSPHATE PHOTOELECTRODES Patent

B. REICHMAN (Christopher Newport Coll.) and C. E. BYVIK, inventors (to NASA) (Christopher Newport Coll.) 27 Mar. 1984 8 p Filed 7 Oct. 1982 Sponsored by NASA (NASA-CASE-LAR-12958-1; US-PATENT-4,439,301; US-PATENT-APPL-SN-433196; US-PATENT-CLASS-204-278; US-PATENT-CLASS-204-DIG.3; US-PATENT-CLASS-104-DIG.4; US-PATENT-CLASS-204-129; US-PATENT-CLASS-204-280; US-PATENT-CLASS-429-111; US-PATENT-CLASS-423-303) Avail: US Patent and Trademark Office CSCL 10A

Photoelectrochemical cells employing chalcogenophosphate (MPX3) photoelectrodes are described where M is selected from the group of transition metal series of elements beginning with scandium (atomic number 21) through germanium (atomic number 32) yttrium (atomic number 39) through antimony (atomic number 51) and lanthanum (atomic number 57) through polonium (atomic number 84); P is phosphorus; and X is selected from the chalogenide series consisting of sulfur, selenium, and tellurium. These compounds have bandgaps in the desirable range from 2.0 eV to 2.2 eV for the photoelectrolysis of water and are stable when used as photoelectrodes for the same.

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

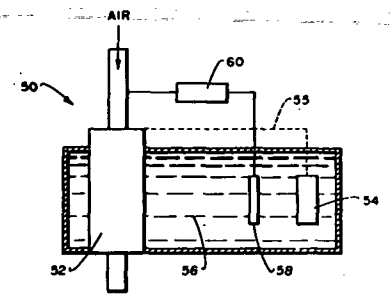


N84-23020*# National Aeronautics and Space Administration. Pasadena Office, Calif.

CHEMICALLY RECHARGEABLE BATTERY Patent Application

R. M. WILLIAMS (JPL, California Inst. of Tech., Pasadena), J. J. ROWLETTE (JPL, California Inst. of Tech., Pasadena), and J. E. GRAF, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 28 Apr. 1983 19 p Sponsored by NASA (NASA-CASE-NPO-16024-1; US-PATENT-APPL-SN-489692) Avail: NTIS HC A02/MF A01 CSCL 10C

The extent of chemical rechargin of discharged iron electrodes of an iron air battery is significantly increased by utilizing nonaqueous, polar liquid reducing agents such as lower alkanols, particularly methanol, either along or containing 10 to 60% of other reducing agents, such as formaldehyde and by conducting recharge at elevated temperatures of 20 deg C to 120 deg C and in presence of base such as 0.1 to 6 M of alkali metal hydroxide or alkoxide. The recharge reaction can be further enhanced in an aqueous or nonaequeous liquid reductant if an inert counterelectrode such as palladium or platinum is connected to the discharged metal electrode without external bias, or an applied bias of from 0.1 to 1.0 V is applied to the electrodes, from potential source. E.A.K.



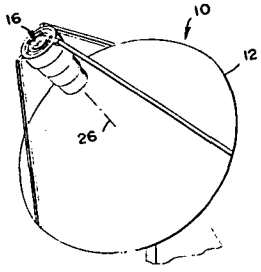
N84-25164*# National Aeronautics and Space Administration. Pasadena Office, Calif.

PROTECTIVE TELESCOPING SHIELD FOR SOLAR CONCENTRATOR Patent Application

M. J. ARGOUD (JPL, California Inst. of Tech., Pasadena), W. L. WALKER (JPL, California Inst. of Tech., Pasadena), and L. V. BUTLER, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 22 Feb. 1984 12 p (Contract NAS7-100) (NASA-CASE-NPO-16236-1; US-PATENT-APPL-SN-582495)

Avail: NTIS HC A02/MF A01 CSCL 10A

An apparatus is described for use with a solar concentrator such as a parabolic dish which concentrates sunlight onto a small opening of a solar receiver, for protecting the receiver in the event of a system failure that could cause concentrated sunlight to damage the receiver. The protective apparatus includes a structure which can be moved from a stowed position where it does not block sunlight, to a deployed position wherein it forms a tube which substantially completely surrounds an axis connecting the receiver opening to the center of the concentrator at locations between the receiver and the concentrator. NASA



N84-28203* National Aeronautics and Space Administration. Pasadena Office, Calif.

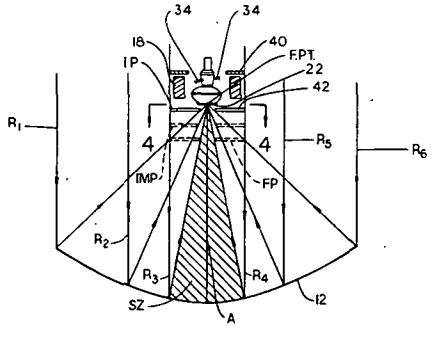
SOLAR ENERGY MODULATOR Patent

R. R. HALE, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) and A. R. MCDOUGAL 28 Feb. 1984 7 p Filed 17 Jul. 1981 Supersedes N82-10496 (20 - 01, p 0072) Sponsored by NASA

(NASA-CASE-NPO-15388-1; US-PATENT-4,433,672; US-PATENT-APPL-SN-284286; US-PATENT-CLASS-126-419; US-PATENT-CLASS-126-438; US-PATENT-CLASS-126-451)

Avail: US Patent and Trademark Office

A module is described with a receiver having a solar energy acceptance opening and supported by a mounting ring along the optic axis of a parabolic mirror in coaxial alignment for receiving solar energy from the mirror, and a solar flux modulator plate for varying the quantity of solar energy flux received by the acceptance opening of the module. The modulator plate is characterized by an annular, plate-like body, the internal diameter of which is equal to or slightly greater than the diameter of the solar energy acceptance opening of the receiver. Slave cylinders are connected to the modulator plate for supporting the plate for axial displacement along the axis of the mirror, therby shading the opening with respect to solar energy flux reflected from the surface of the mirror to the solar energy acceptance opening. T.M.



N84-28204* National Aeronautics and Space Administration. Pasadena Office, Calif.

SOLAR CONCENTRATOR PROTECTIVE SYSTEM Patent

M. K. SELCUK, inventor (to NASA) 22 May 1984 10 p Filed 25 Jun. 1982 Supersedes N82-28785 (20 - 19, p 2712)

(NASA-CASE-NPO-15662-1; US-PATENT-4,449,514; US-PATENT-APPL-SN-392103; US-PATENT-CLASS-126-418; US-PATENT-CLASS-126-438; US-PATENT-CLASS-126-440)

Avail: US Patent and Trademark Office CSCL 10A

A mechanism that blocks concentrated sunlight from reaching a receiver, in the event of a tracking failure or loss of coolant is described. Sunlight is normally concentrated by a dish reflector onto the opening of a receiver. A faceplate surrounds the opening, and coolant carrying tubes, line the receiver. If the concentrated sunlight wanders so it begins to fall on the faceplate, then the sunlight will melt a portion of a fuse wire portion will break. The wire is attached to a flange on a shutter frame, and breaking of the fuse wire allows the frame to fall. Normally, the shutter frame supports shutter elements that are held open by cam followers that bear against cams.

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

N84-28205* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

CHROMIUM ELECTRODES FOR REDOX CELLS Patent

V. JALAN, M. A. REID, and A. CHARLESTON, inventors (to NASA) 19 Jun. 1984 8 p Filed 26 Feb. 1982 Supersedes N82-22672 (20 - 13, p 1822)

(NASA-CASE-LEW-13653-1; US-PATENT-4,454,649; US-PATENT-APPL-SN-352821; US-PATENT-CLASS-29-623.5; US-PATENT-CLASS-29-825; US-PATENT-CLASS-427-113; US-PATENT-CLASS-427-115; US-PATENT-CLASS-427-125; US-PATENT-CLASS-427-226; US-PATENT-CLASS-427-379; US-PATENT-CLASS-427-380; US-PATENT-CLASS-427-372.2; US-PATENT-CLASS-427-443; US-PATENT-CLASS-429-44; US-PATENT-CLASS-204-290) Avail: US Patent and Trademark Office CSCL 10C

An improved electrode having a gold coating for use in the anode compartment of a REDOX cell is described. The anode fluid utilizes a chromic/chromous couple. A carbon felt is soaked in methanol, rinsed in water, dried and then heated in KOH after which it is again washed in deionized water and dried. The felt is then moistened with a methanol water solution containing chloroauric acid and is stored in a dark place while still in contact with the gold-containing solution. After all the gold-containing solution is absorbed in the felt, the latter is dried by heat and then heat treated at a substantially greater temperature. The felt is then suitable for use as an electrode and is wetted with water or up to two molar HCl prior to installation in a REDOX cell. The novelty of the invention lies in the use of KOH for cleaning the felt and the use of alcohol as a carrier for the gold together with the heat treating procedure.

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

N84-32909*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

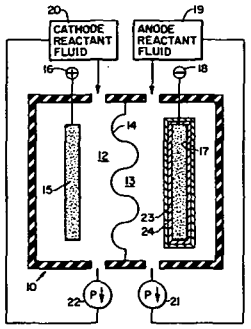
NEGATIVE ELECTRODE CATALYST FOR THE IRON-CHROMIUM REDOX ENERGY STORAGE SYSTEM Patent Application

R. F. GAHN and N. H. HAGEDORN, inventors (to NASA) 20 Aug. 1984 14 p

(NASA-CASE-LEW-14028-1; NAS 1.71:LEW-14028-1; US-PATENT-APPL-SN-642310) Avail: NTIS HC A02/MF A01 CSCL 10C

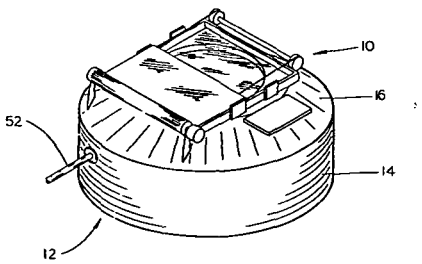
A redox cell which operates at elevated temperatures and which utilizes the same two metal couples in each of the two reactant

fluids is disclosed. Each fluid includes a bismuth salt and may also include a lead salt. A low cost, cation permselective membrane separates the reactant fluids. NASA



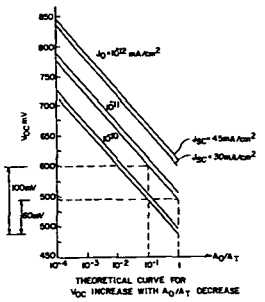
N84-32910*# National Aeronautics and Space Administration. Pasadena Office, Calif.
STABLE DENSITY STRATIFICATION SOLAR POND Patent Application
F. L. LANSING, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 18 Oct. 1983 17 p
(Contract NAS7-100)
(NASA-CASE-NPO-15419-2; NAS 1.71:NPO-15419-2;
US-PATENT-APPL-SN-542557) Avail: NTIS HC A02/MF A01
CSCL 10A

A stable density stratification solar pond for use in the collection and storage of solar thermal energy is disclosed. The solar pond includes a container having a first section characterized by an internal wall of a substantially cylindrical configuration and a second section having an internal wall of a substantially truncated conical configuration surmounting the first section in coaxial alignment. The second section of the container is characterized by a base of a diameter substantially equal to the diameter of the first section and a truncated apex defining a solar energy acceptance opening. A body of immiscible liquids is disposed within the container and comprises a first portion substantially filling the first section of the container and a second, aqueous based portion, substantially filling the second section of the container. The first portion is an organic based liquid of a darker color than the second portion and of a greater density. A removable protective cover plate is provided for covering the acceptance opening. NASA



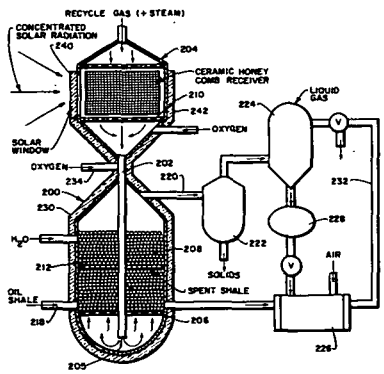
N84-32911*# National Aeronautics and Space Administration. Pasadena Office, Calif.
A NEW SOLAR CELL DESIGN FOR IMPROVED OPEN CIRCUIT VOLTAGE AND HIGH EFFICIENCY Patent Application
T. DAUD (JPL, California Inst. of Tech., Pasadena) and K. M. KOLIWAD, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 23 May 1984 10 p
(Contract NAS7-100)
(NASA-CASE-NPO-16126-1; NAS 1.71:NPO-16126-1;
US-PATENT-APPL-SN-612990) Avail: NTIS HC A02/MF A01
CSCL 10A

A silicon solar cell wherein the ratio of the p-n junction area to the total outer surface area of the cell exposed to solar radiation is reduced to provide increased open circuit voltage and improved efficiency is disclosed. The solar cell is fabricated by forming p-n junction areas in discrete spaced-apart portions of a silicon wafer. These discrete areas are spaced in any desired manner and coupled with a metal grid of narrow metal contacts. The total area of the discrete portions forming the p-n junctions is controlled to provide improved efficiency. NASA



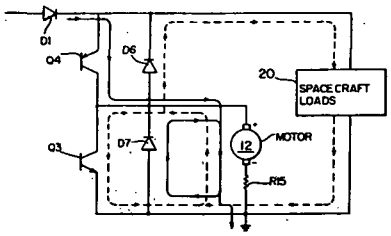
N84-32912*# National Aeronautics and Space Administration. Pasadena Office, Calif.
SOLAR-HEATED OIL SHALE RETORT Patent Application
S. A. QADER, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 23 Jul. 1984 16 p
(Contract NAS7-100)
(NASA-CASE-NPO-16392-1; NAS 1.71:NPO-16392-1;
US-PATENT-APPL-SN-633363) Avail: NTIS HC A02/MF A01
CSCL 10A

An oil recovery process in which a bed of oil shale particles are pyrolyzed in a retort by means of a heated carrier gas stream passing through a central conduit within the bed, and then upwardly through a fixed bed or fluidized bed of the shale is disclosed. The shale is subjected to pyrolysis and evolves kerogen liquid, thermally and pyrolyzed liquids, and gases which enter the carrier gas to form a pyrolysis gas. The liquid pyrolysis oil is separated from the pyrolysis gas ion separator and a portion of the separated gas is recycled to a solar heat exchanger. There it is heated to a temperature of at least 350 C before being fed to the central conduit. NASA



N84-32913*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
BI-DIRECTIONAL CONTROL SYSTEM FOR ENERGY FLOW IN A SOLAR POWERED FLYWHEEL Patent Application
F. J. NOLA, inventor (to NASA) 31 Jul. 1984 18 p
(NASA-CASE-MFS-25978-1; NAS 1.71:MFS-25978-1; US-PATENT-APPL-SN-636459) Avail: NTIS HC A02/MF A01 CSCL 10B

An energy storage system for a spacecraft is provided which employs a solar powered flywheel arrangement including a motor/generator which, in different operating modes, drives the flywheel and is driven thereby. A control circuit, including a threshold comparator, senses the output of a solar energy converter, and when a threshold voltage is exceeded thereby indicating the availability of solar power for the spececraft loads, activates a speed control loop including the motor/generator so as to accelerate the flywheel to a constant speed and thereby store mechanical energy, while also supplying energy from the solar converter to the loads. Under circumstances where solar energy is not available, the control circuit deactivates the speed control loop and activates a voltage control loop that provides for operation of the motor as generator so that mechanical energy from the flywheel is converted into electrical energy for supply to the spacecraft loads. NASA



N84-34792* National Aeronautics and Space Administration. Pasadena Office, Calif.
SALTLESS SOLAR POND Patent
E. I. H. LIN, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 11 Sep. 1984 10 p Filed 28 May 1982 Supersedes N82-29714 (20 - 20, p 2849) Sponsored by NASA (NASA-CASE-NPO-15808-1; NAS 1.71:NPO-15808-1; US-PATENT-4,470,403; US-PATENT-APPL-SN-383068; US-PATENT-CLASS-126-415; US-PATENT-CLASS-4-498) Avail: US Patent and Trademark Office CSCL 10A

A solar pond adapted for efficiently trapping and storing radiant solar energy without the use of a salt concentration gradient in the pond is disclosed. A body of water which may be fresh, saline, relatively clear or turbid, is substantially covered by a plurality of floating honeycomb panels. The honeycomb panels are made of a material such as glass which is pervious to short wave solar radiation but impervious to infrared radiation. Each honeycomb panel includes a multitude of honeycomb cells. The honeycomb panels are divided into the elongated honeycomb cells by a multitude of intermediate plates disposed between a bottom plate and top plate of the panel. The solar pond is well suited for providing hot water of approximately 85 to 90 C temperature for direct heating applications, and for electrical power generation.
Official Gazette of the U.S. Patent and Trademark Office

47

METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

N84-28292* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
RADIONUCLIDE COUNTING TECHNIQUE FOR MEASURING WIND VELOCITY AND DIRECTION Patent
J. J. SINGH, inventor (to NASA) 22 May 1984 17 p Filed 24 Nov. 1982 Supersedes N83-14863 (21 - 05, p 0728) (NASA-CASE-LAR-12971-1; US-PATENT-4,449,400; US-PATENT-APPL-SN-444149; US-PATENT-CLASS-73-189; US-PATENT-CLASS-73-861.71; US-PATENT-CLASS-250-356.1) Avail: US Patent and Trademark Office CSCL 04B

An anemometer utilizing a radionuclide counting technique for measuring both the velocity and the direction of wind is described. A pendulum consisting of a wire and a ball with a source of radiation on the lower surface of the ball is positioned by the wind. Detectors and are located in a plane perpendicular to pendulum (no wind). The detectors are located on the circumferene of a circle and are equidistant from each other as well as the undisturbed (no wind) source ball position.
Official Gazette of the U.S. Patent and Trademark Office

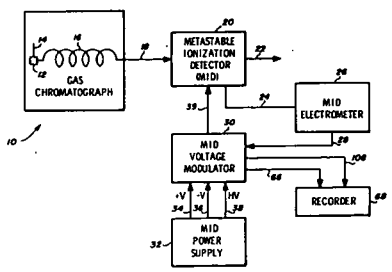
51

LIFE SCIENCES (GENERAL)

Includes genetics.

N84-23093*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
MODULATED VOLTAGE METASTABLE IONIZATION DETECTOR Patent Application
D. E. HUMPHRY, inventor (to NASA) 22 Feb. 1984 21 p
(NASA-CASE-ARC-11503-1; US-PATENT-APPL-SN-582643)
Avail: NTIS HC A02/MF A01 CSCL 06B

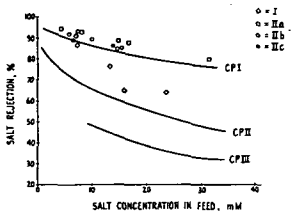
Metastable ionization detectors used for chromatographic analysis usually employ a fixed high voltage for the ionization potential. For this reason, the operation range is limited to about three orders of magnitude. By use of the technique disclosed in the instant invention, operating ranges of about nine orders of magnitude are obtained. The output current from a metastable ionization detector is applied to a modulation voltage circuit. An adjustment is made to balance out the background current, and an output current, above background, is applied to an input of a strip chart recorder. For low level concentrations, i.e., low detected output current, the ionization potential will be at a maximum and the metastable ionization detector will operate at its most sensitive level. NASA



N84-28361* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
METHOD FOR THE PREPARATION OF THIN-SKINNED ASYMMETRIC REVERSE OSMOSIS MEMBRANES AND PRODUCTS THEREOF Patent
T. J. WYDEVEN, inventors (to NASA) (NAS-NRC, Washington, D.C.) and M. G. KATZ (NAS-NRC, Washington, D.C.) 26 Jun. 1984 7 p Filed 25 Jun. 1982 Supersedes N82-28444 (20 - 19, 2664) Sponsored by NASA
(NASA-CASE-ARC-11359-1; US-PATENT-4,456,708; US-PATENT-APPL-SN-392092; US-PATENT-CLASS-521-141; US-PATENT-CLASS-521-142; US-PATENT-CLASS-521-149; US-PATENT-CLASS-264-41) Avail: US Patent and Trademark Office CSCL 07C

A method for preparing water insoluble asymmetric membranes from water soluble polymers is discussed. The process involves casting a film of the polymer, partially drying it, and then contacting it with a concentrated solution of a transition metal salt. The transition metal ions render the polymer insoluable and are believed to form a complex with it. Optionally, the polymer is crosslinked with heat or radiation. The most preferred polymer is poly(vinyl alcohol). The most preferred complexing salt is copper sulfate. The process and the metal ion linked membranes are discussed. The membranes are reverse osmosis membranes.

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



52

AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and weightlessness.

N84-23095* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD OF MAKING AN ION BEAM SPUTTER-ETCHED VENTRICULAR CATHETER FOR HYDROCEPHALUS SHUNT Patent
B. A. BANKS, inventor (to NASA) 21 Feb. 1984 8 p Filed 24 Nov. 1982 Division of Serial No. 272407, filed 10 Jun. 1981, *Patent No. 4,377,169*
(NASA-CASE-LEW-13107-2; US-PATENT-4,432,853; US-PATENT-APPL-SN-444124; US-PATENT-CLASS-204-192E; US-PATENT-CLASS-156-643; US-PATENT-CLASS-156-644; US-PATENT-CLASS-156-668) Avail: US Patent and Trademark Office CSCL 06B

The centricular catheter comprises a multiplicity of inlet microtubules. Each microtubule has both a large opening at its inlet end and a multiplicity of microscopic openings along its lateral surfaces. The microtubules are perforated by an ion beam sputter etch technique. The holes are etched in each microtubule by directing an ion beam through an electro formed mesh mask producing perforations having diameters ranging from about 14 microns to about 150 microns. This structure assures a reliable means for shunting cerebrospinal fluid from the cerebral ventricles to selected areas of the body.

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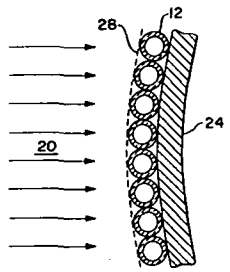


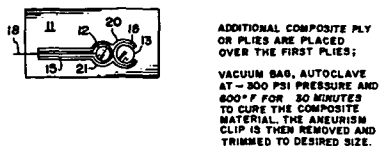
N84-28388* National Aeronautics and Space Administration. *Langley Research Center, Hampton, Va.*
MEDICAL CLIP Patent
R. M. BAUCOM, *inventor (to NASA)* 22 Nov. 1983 6 p Filed 15 May 1981 Supersedes N81-29768 (19 - 20, p 2817)
(NASA-CASE-LAR-12650-1; US-PATENT-4,416,266; US-PATENT-APPL-SN-264381; US-PATENT-CLASS-128-325; US-PATENT-CLASS-128-346; US-PATENT-CLASS-24-560)
Avail: US Patent and Trademark Office CSCL 06B

An X-ray transparent and biological inert medical clip for treating aneurisms and the like is described. A graphite reinforced composite film is molded into a unitary structure having a pair of hourglass-like cavities hinged together with a pair of jaws for grasping the aneurism extending from the wall of one cavity. A silicone rubber pellet is disposed in the other cavity to exert a spring force through the hinge area to normally bias the jaws into contact with each other.

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

N84-28389* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PROCESS OF MAKING MEDICAL CLIP Patent
R. M. BAUCOM, inventor (to NASA) 15 May 1984 6 p Filed 10 Feb. 1983 Supersedes N84-15764 (22 - 06, p 887) Division of abandoned US-Patent-SN-264381, filed 15 May 1981
(NASA-CASE-LAR-12650-2; US-PATENT-4,447,943; US-PATENT-APPL-SN-465363; US-PATENT-CLASS-29-423; US-PATENT-CLASS-29-451; US-PATENT-CLASS-156-191; US-PATENT-CLASS-156-285; US-PATENT-CLASS-156-289; US-PATENT-CLASS-156-382; US-PATENT-APPL-SN-264381)
Avail: US Patent and Trademark Office CSCL 06B

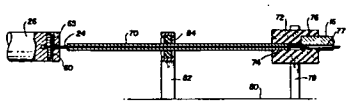
An X-ray transparent and biologically inert medical clip for treating aneurisms and the like is disclosed, as well as a process for its production. A graphite reinforced composite film is molded into a unitary structure having a pair of hourglass-like cavities which are hinged together with a pair of jaws for grasping the aneurism extending from the wall of one cavity. A silicone rubber pellet is disposed in the other cavity to exert a spring force through the hinge area to normally bias the jaws into contact with each other. *Official Gazette of the U.S. Patent and Trademark Office*



N84-34913* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
APPARATUS FOR DISINTEGRATING KIDNEY STONES Patent
E. D. ANGULO, inventor (to NASA) 2 Oct. 1984 7 p Filed 13 May 1982 Supersedes N82-26961 (17 - 20, p 2451)
(NASA-CASE-GSC-12652-1; US-PATENT-4,474,180; US-PATENT-APPL-SN-377891; US-PATENT-CLASS-128-328; US-PATENT-CLASS-128-24-A) Avail: US Patent and Trademark Office CSCL 06B

The useful life of the wire probe in an ultrasonic kidney stone disintegration instrument is enhanced and prolonged by attaching the wire of the wire probe to the tip of an ultrasonic transducer by means of a clamping arrangement. Additionally, damping material is applied to the wire probe in the form of a damper tube through which the wire probe passes in the region adjacent the transducer tip. The damper tube extends outwardly from the transducer tip a predetermined distance, terminating in a resilient soft rubber joint. Also, the damper tube is supported intermediate its length by a support member. The damper system thus acts to inhibit lateral vibrations of the wire in the region of the transducer tip while providing little or no damping to the linear vibrations imparted to the wire by the transducer.

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



54

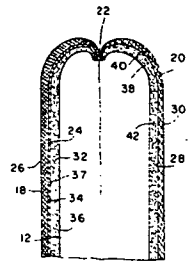
MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

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

N84-23113* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
HEAT RESISTANT PROTECTIVE HAND COVERING Patent
K. R. SIDMAN (Little (Arthur D.), Inc., Cambridge, Mass.) and I. J. ARONS, inventors (to NASA) (Little (Arthur D.), Inc., Cambridge, Mass.) 28 Feb. 1984 6 p Filed 30 Jun. 1982 Sponsored by NASA
(NASA-CASE-MSC-20261-2; US-PATENT-4,433,439; US-PATENT-APPL-SN-393581; US-PATENT-CLASS-2-161R; US-PATENT-CLASS-2-167) Avail: US Patent and Trademark Office CSCL 06Q

The heat resistant, protective glove is made up of first and second shell sections which define a palm side and a backside, respectively. The first shell section is made of a twill wave fabric of a temperature-resistant aromatic polyamide fiber. The second shell section is made of a knitted fabric of a temperature-resistant aromatic polyamide fiber. The first and second shell sections are secured to one another, e.g., by sewing, to provide the desired glove configuration and an opening for insertion of the wearer's hand. The protective glove also includes a first liner section which is secured to and overlies the inner surface of the first shell section and is made of a felt fabric of a temperature-resistant aromatic polyamide fiber and has a flame resistant, elastomenic coating on the surface facing and overlying the inner surface of the first shell section.

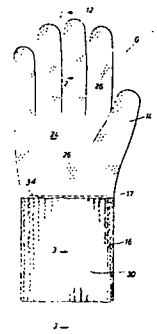
Official Gazette of the U.S. Patent and Trademark Office



N84-28484* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
HEAT RESISTANT PROTECTIVE HAND COVERING Patent
R. P. TSCHIRCH (Little (Arthur D.), Inc., Cambridge, Mass.), K. R. SIDMAN (Little (Arthur D.), Inc., Cambridge, Mass.), and I. J. ARONS, inventors (to NASA) (Little (Arthur D.), Inc., Cambridge, Mass.) 19 Jun. 1984 6 p Filed 30 Jun. 1982 Supersedes N82-32985 (20 - 23, p 3331) Sponsored by NASA
(NASA-CASE-MSC-20261-1; US-PATENT-4,454,611; US-PATENT-APPL-SN-393586; US-PATENT-CLASS-2-161R; US-PATENT-CLASS-2-164; US-PATENT-CLASS-2-167) Avail: US Patent and Trademark Office CSCL 06Q

A heat-resistant aromatic polyamide fiber is described. The outer surface of the shell is coated with a fire-resistant elastomer and liner. Generally conforming and secured to the shell and disposed inwardly of the shell, the liner is made of a felt fabric of temperature-resistant aromatic polymide fiber.

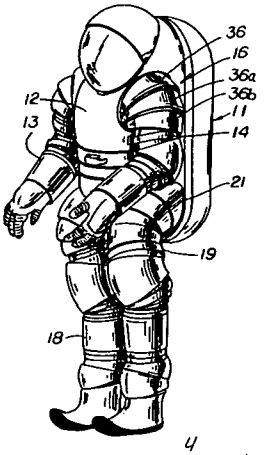
Official Gazette of the U.S. Patent and Trademark Office



N84-33021*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SHOULDER AND HIP JOINT FOR HARD SPACE SUITS AND THE LIKE Patent Application
H. C. VYKUKAL, inventor (to NASA) 20 Aug. 1984 22 p
(NASA-CASE-ARC-11534-1; NAS 1.71:ARC-11534-1; US-PATENT-APPL-SN-642602) Avail: NTIS HC A02/MF A01 CSCL 06Q

A joint between the covering and the upper arm covering (i.e., shoulder) or between the torso covering and upper leg covering (i.e., hip) is disclosed. Each joint has an outer covering and a

inner covering. The outer covering has plural truncated toroidal sections decreasing in size proceeding outwardly. To accommodate the decreased size of the next section, at the smaller end of each section is an end wall filling what would othewise be a gap between the sections. Bellows like inner walls are also provided for each section fixed at one end to an inner cylindrical flange and, at the opposite end, to an end wall. Each outer section may rotate 360 deg relative to the next outer section, whereas the bellows sections do not rotate, but rather expand or contract locally as the rigid sections rotate relative to each other. NASA



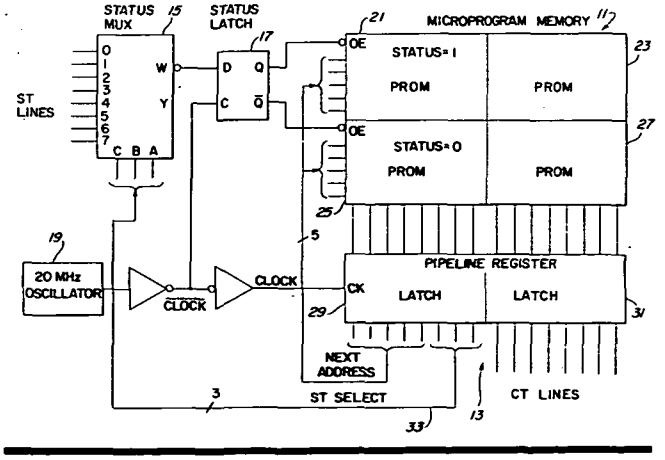
60

COMPUTER OPERATIONS AND HARDWARE

Includes computer graphics and data processing.

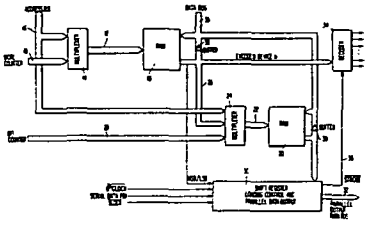
N84-25306*# National Aeronautics and Space Administration. Pasadena Office, Calif.
NANOSEQUENCER DIGITAL LOGIC CONTROLLER Patent Application
C. R. LAHMEYER, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 9 Mar. 1984 14 p
(Contract NAS7-100)
(NASA-CASE-NPO-16116-1; US-PATENT-APPL-SN-587749)
Avail: NTIS HC A02/MF A01 CSCL 09B

A digital logic controller providing instruction execution times on the order of 50 nanoseconds and employing a read-only memory device is described. A portion of each instruction provides a status-select control signal and address signal for controlling selection of the next instruction from the read-only memory. NASA



N84-28491* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MEMORY-BASED PARALLEL DATA OUTPUT CONTROLLER Patent
R. J. STATTEL and J. K. NISWANDER, inventors (to NASA) 6 Mar. 1984 10 p Filed 9 Jun. 1983 Supersedes N83-29302 (21 - 18, p 2886) Continuation of abandoned US Patent Appl-SN-128230, filed 7 Mar. 1980
(NASA-CASE-GSC-12447-2; US-PATENT-4,435,781; US-PATENT-APPL-SN-501060; US-PATENT-CLASS-364-900; US-PATENT-APPL-SN-128230) Avail: US Patent and Trademark Office CSCL 09B

A memory-based parallel data output controller employs associative memories and memory mapping to decommutate multiple channels of telemetry data. The output controller contains a random access memory (RAM) which has at least as many address locations as there are channels. A word counter addresses the RAM which provides as it outputs an encoded peripheral device number and a MSB/LSB-first flag. The encoded device number and a bit counter address a second RAM which contains START and STOP flags to pick out the required bits from the specified word number. The LSB/MSB, START and STOP flags, along with the serial input digital data go to a control block which selectively fills a shift register used to drive the parallel data output bus.
Official Gazette of the U.S. Patent and Trademark Office



N84-28492* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
DIGITAL INTERFACE FOR BI-DIRECTIONAL COMMUNICATION BETWEEN A COMPUTER AND A PERIPHERAL DEVICE Patent
H. H. BOND, JR., inventor (to NASA) (Singer Co., Binghamton, N.Y.) and C. R. FRANKLIN 1 May 1984 35 p Filed 18 Feb. 1981 Sponsored by NASA
(NASA-CASE-MSC-20258-1; US-PATENT-4,446,459; US-PATENT-APPL-SN-235472; US-PATENT-CLASS-340-825.21; US-PATENT-CLASS-340-825.5; US-PATENT-CLASS-364-900)
Avail: US Patent and Trademark Office CSCL 09B

For transmission of data from the computer to the peripheral, the computer initially clears a flipflop which provides a select signal to a multiplexer. A data available signal or data strobe signal is produced while tht data is being provided to the interface. Setting of the flipflop causes a gate to provide to the peripherial a signal indicating that the interface has data available for transmission. The peripheral provides an acknowledge or strobe signal to transfer the data to the peripheral. For transmission of data from the peripheral to the computer, the computer presents the initially cleared flipflop. A data request signal from the peripheral indicates that the peripheral has data available for transmission to the computer. An acknowledge signal indicates that the interface is ready to receive data from the peripheral and to strobe that data into the interface.
Official Gazette of the U.S. Patent and Trademark Office

70

PHYSICS (GENERAL)

N84-28565* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ION SPUTTER TEXTURED GRAPHITE ELECTRODE PLATES Patent
A. N. CURREN, R. FORMAN, J. S. SOVEY, and E. G. WINTUCKY, inventors (to NASA) 22 Nov. 1983 7 p Filed 31 Mar. 1982 Supersedes N82-26386 (20 - 17, p 2370) Division of US Patent Application SN-264378, US Patent-4,349,424, filed 15 May 1981
(NASA-CASE-LEW-12919-2; US-PATENT-4,417,175; US-PATENT-4,349,424; US-PATENT-APPL-SN-364072; US-PATENT-APPL-SN-264378; US-PATENT-CLASS-315-5.38; US-PATENT-CLASS-313-106; US-PATENT-CLASS-313-107; US-PATENT-CLASS-313-351) Avail: US Patent and Trademark Office CSCL 20C

A specially textured surface of pyrolytic graphite exhibits extremely low yields of secondary electrons and reduced numbers of reflected primary electrons after impingement of high energy primary electrons. Electrode plates of this material are used in multistage depressed collectors. An ion flux having an energy between 500 iV and 1000 iV and a current density between 1.0 mA/sq cm and 6.0 mA/sq cm produces surface roughening or texturing which is in the form of needles or spires. Such textured surfaces are especially useful as anode collector plates in high tube devices.

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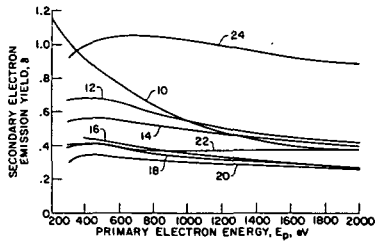


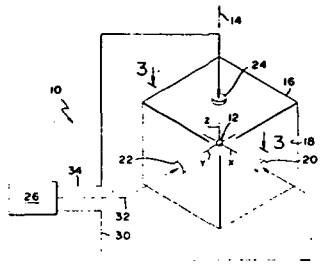
71

ACOUSTICS

Includes sound generation, transmission, and attenuation.

N84-23233* National Aeronautics and Space Administration. Pasadena Office, Calif.
ACOUSTIC ROTATION CONTROL Patent
D. D. ELLEMAN (California Inst. of Tech., Pasadena), A. P. CROONQUIST (California Inst. of Tech., Pasadena), and T. G. WANG, inventors (to NASA) (California Inst. of Tech., Pasadena) 20 Dec. 1983 7 p Filed 15 Mar. 1982 Sponsored by NASA
(NASA-CASE-NPO-15689-1; US-PATENT-4,420,977; US-PATENT-APPL-SN-358089; US-PATENT-CLASS-73-505; US-PATENT-CLASS-60-721; US-PATENT-CLASS-318-116; US-PATENT-CLASS-310-300) Avail: US Patent and Trademark Office CSCL 20A

A system is described for acoustically controlled rotation of a levitated object, which avoids deformation of a levitated liquid object. Acoustic waves of the same wavelength are directed along perpendicular directions across the object, and with the relative phases of the acoustic waves repeatedly switched so that one wave alternately leads and lags the other by 90 deg. The amount of torque for rotating the object, and the direction of rotation, are controlled by controlling the proportion of time one wave leads the other and selecting which wave leads the other most of the time. Official Gazette of the U.S. Patent and Trademark Office.



N84-28568* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SONIC LEVITATION APPARATUS Patent
S. A. DUNN (Bjorksten Research Labs., Inc., Madison, Wis.), A. R. POMPLUM (Bjorksten Research Labs., Inc., Madison, Wis.), E. G. PAQUETTE (Bjorksten Research Labs., Inc., Madison, Wis.), E. C. ETHRIDGE, and J. L. JOHNSON, inventors (to NASA) 8 May 1984 7 p Filed 12 May 1983 Supersedes N83-26646 (21 - 15, p 2487)
(NASA-CASE-MFS-25828-1; US-PATENT-4,447,251; US-PATENT-APPL-SN-493866; US-PATENT-CLASS-65-142; US-PATENT-CLASS-65-21.3; US-PATENT-CLASS-65-21.4; US-PATENT-CLASS-65-160; US-PATENT-CLASS-137-838; US-PATENT-CLASS-366-106; US-PATENT-CLASS-425-6) Avail: US Patent and Trademark Office

A sonic levitation apparatus is disclosed which includes a sonic transducer which generates acoustical energy responsive to the level of an electrical amplifier. A duct communicates with an acoustical chamber to deliver an oscillatory motion of air to a plenum section which contains a collimated hole structure having a plurality of parallel orifices. The collimated hole structure converts the motion of the air to a pulsed. Unidirectional stream providing enough force to levitate a material specimen. Particular application to the production of microballoons in low gravity environment is discussed.

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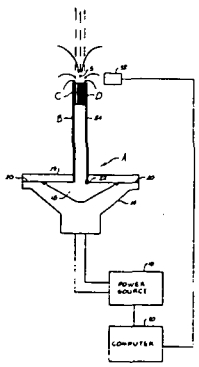


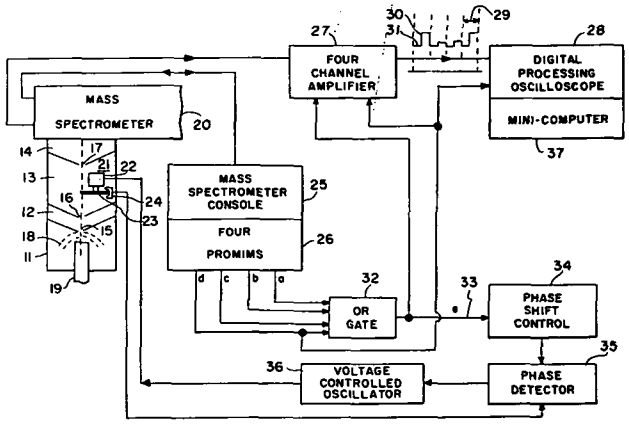
72

ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure and molecular spectra.

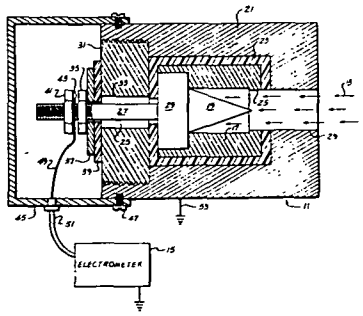
N84-25431*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
CHOPPED MOLECULAR BEAM MULTIPLEXING SYSTEM Patent Application
B. R. ADAMS, inventor (to NASA) 19 Apr. 1984 21 p
(NASA-CASE-LAR-13174-1; US-PATENT-APPL-SN-602105)
Avail: NTIS HC A02/MF A01 CSCL 20H

The integration of a chopped molecular beam mass spectrometer with a time multiplexing system is described. The chopping of the molecular beam is synchronized with the time intervals by a phase detector and a synchronous motor. Arithmetic means are generated for phase shifting the chopper with respect to the multiplexer. A four channel amplifier provides the capacity to independently vary the baseline and amplitude in each channel of the multiplexing system. NASA



N84-28575* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
APPARATUS FOR MEASURING CHARGED PARTICLE BEAM Patent
D. A. GREGORY and C. D. STOCKS, inventors (to NASA) 19 Jun. 1984 5 p Filed 26 Jan. 1982
(NASA-CASE-MFS-25641-1; US-PATENT-4,455,532;
US-PATENT-APPL-SN-342857; US-PATENT-CLASS-324-457;
US-PATENT-CLASS-324-71.3; US-PATENT-CLASS-324-72.5;
US-PATENT-CLASS-250-305) Avail: US Patent and Trademark Office CSCL 20H

An apparatus to measure the incident charged particle beam flux while effectively eliminating losses to reflection and/or secondary emission of the charged particle beam being measured is described. It comprises a sense cup through which the charged particle beam enters. A sense cone forms the rear wall of the interior chamber with the cone apex adjacent the entry opening. An outer case surrounds the sense cup and is electrically insulated therefrom. Charged particles entering the interior chamber are trapped and are absorbed by the sense cup and cone and travel through a current measuring device to ground.
Official Gazette of the U.S. Patent and Trademark Office



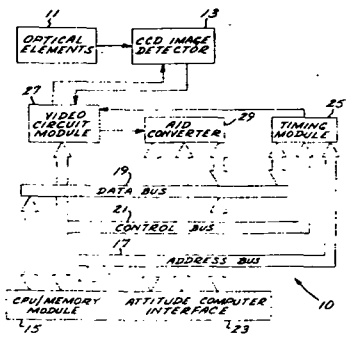
74

OPTICS

Includes light phenomena.

N84-23247* National Aeronautics and Space Administration. Pasadena Office, Calif.
PROGRAMMABLE SCAN/READ CIRCUITRY FOR CHARGE COUPLED DEVICE IMAGING DETECTORS Patent
P. M. SALOMON (California Inst. of Tech., Pasadena) and K. SMILOWITZ (California Inst. of Tech., Pasadena) 7 Feb. 1984 13 p Filed 24 Jun. 1981 Sponsored by NASA
(NASA-CASE-NPO-15345-1; US-PATENT-4,430,673;
US-PATENT-APPL-SN-276749; US-PATENT-CLASS-358-213;
US-PATENT-CLASS-358-125) Avail: US Patent and Trademark Office CSCL 20F

A circuit for scanning and outputting the induced charges in a solid state charge coupled device (CCD) image detector is disclosed in an image detection system for use in a spacecraft attitude control system. The image detection system includes timing control circuitry for selectively controlling the output of the CCD detector so that video outputs are provided only with respect to induced charges corresponding to predetermined sensing element lines of the CCD detector. The timing control circuit and the analog to digital converter are controlled by a programmed microprocessor which defines the video outputs to be converted and further controls the timing control circuit so that no video outputs are provided during the delay associated with analog to digital conversion.
Official Gazette of the U.S. Patent and Trademark Office



N84-23248* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

DUAL APERTURE MULTISPECTRAL SCHMIDT OBJECTIVE Patent

P. O. MINOTT, inventor (to NASA) 24 Apr. 1984 8 p Filed 13 May 1982

(NASA-CASE-GSC-12756-1; US-PATENT-4,444,464; US-PATENT-APPL-SN-378535; US-PATENT-CLASS-350-172; US-PATENT-CLASS-350-173; US-PATENT-CLASS-350-443)

Avail: US Patent and Trademark Office CSCL 20F

A dual aperture, off-axis catadioptic Schmidt objective is described. It is formed by symmetrically aligning two pairs of Schmidt objectives on opposite sides of a common plane (x,z). Each objective has a spherical primary mirror with a spherical focal plane and center of curvature aligned along an optic axis laterally spaced apart from the common plane. A multiprism beamsplitter with buried dichroic layers and a convex entrance and concave exit surfaces optically concentric to the center of curvature may be positioned at the focal plane. The primary mirrors of each objective may be connected rigidly together and may have equal or unequal focal lengths.

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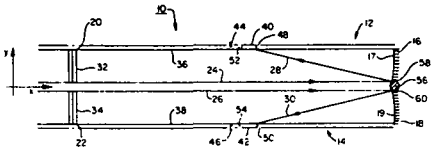


N84-23251*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

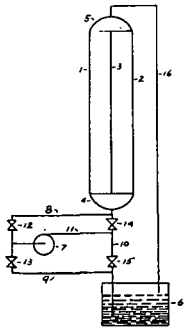
LIGHT TRANSMITTING WINDOW ASSEMBLY Patent Application

D. L. CONNELLY, inventor (to NASA) 16 Aug. 1983 10 p

(NASA-CASE-MSC-18417-1; US-PATENT-APPL-SN-523559)

Avail: NTIS HC A01/MF A01 CSCL 20F

This invention provides a light transmitting assembly that changes from a state of transparency to one of translucency. It comprises two parallel spaced apart panes of transparent material, such as glass, with a film of polytetrafluoroethane, which is inherently translucent or opaque, disposed between. The assembly is rendered transparent by introducing a fluid into the assembly to substantially cover a surface of the film; the fluid having a refractive index corresponding to the refractive index of the film. The translucency is restored by removing the fluid. Author



N84-25450*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

OPTICAL SCANNER Patent Application

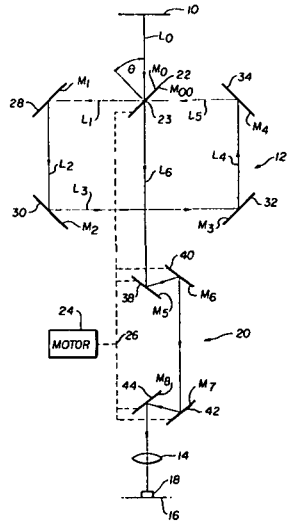
M. W. FINKEL, inventor (to NASA) 2 May 1984 19 p

(NASA-CASE-GSC-12897-1; US-PATENT-APPL-SN-606432)

Avail: NTIS HC A02/MF A01 CSCL 20F

An optical scanner for imaging lines in an object plane onto a linear array in a focal plane either continuously or discretely is described. The scanner consists of a set of four mutually perpendicularly oriented plane corner mirrors which provide a reflecting path that describes a parallelogram. In addition, there is a plane parallel scanning mirror with a front and back reflecting surface located midway between the first and fourth corner mirrors. It is oriented so that in the mid-scan position it is parallel to the first corner mirror, and therefore perpendicular to the fourth corner mirror. As the scan mirror rotates, rays incident from a plurality of lines in the object plane are selectively directed through the optical system and arrive at a common intersection on the back surface of the scanning mirror. There the rays are colinearly directed toward a lens, and then imaged onto the linear array in the focal plane.

NASA



N84-26400*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

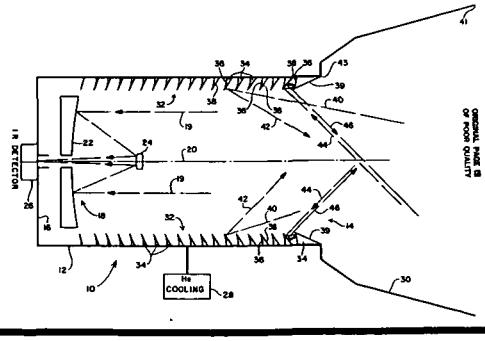
OPTICAL SYSTEM WITH REFLECTIVE BAFFLES Patent Application

W. I. LINLOR, inventor (to NASA) 28 Mar. 1984 17 p

(NASA-CASE-ARC-11502-1; US-PATENT-APPL-SN-594134)

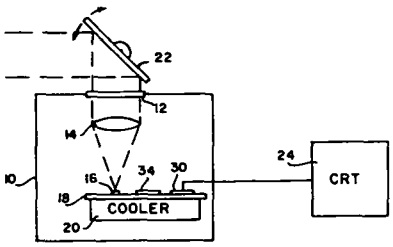
Avail: NTIS HC A02/MF A01 CSCL 20F

Reflective baffles for optical systems have elliptical concave surfaces facing forward of the system to reflex off axis radiation directly out of the telescope only. Such reflective baffles intrude substantially into the field of vision of the optical system and are effective only for reflecting meridional off axis rays. The baffles of this invention reduce the field of vision only slightly and are effective both for meridional and skew off axis rays. NASA



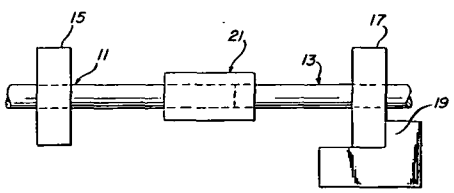
N84-28590* National Aeronautics and Space Administration. Pasadena Office, Calif.
INTEGRATING IR DETECTOR IMAGING SYSTEMS Patent
G. C. BAILEY, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 17 Apr. 1984 8 p Filed 25 Aug. 1981 Supersedes N83-20757 (21 - 10, p 1613) Sponsored by NASA
(NASA-CASE-NPO-15805-1; US-PATENT-4,443,701; US-PATENT-APPL-SN-296137; US-PATENT-CLASS-250-332; US-PATENT-CLASS-250-338) Avail: US Patent and Trademark Office CSCL 20F

An integrating IR detector array for imaging is provided in a hybrid circuit with InSb mesa diodes in a linear array, a single J-FET preamplifier for readout, and a silicon integrated circuit multiplexer. Thin film conductors in a fan out pattern deposited on an Al2O3 substrate connect the diodes to the multiplexer, and thick film conductors also connect the reset switch and preamplifier to the multiplexer. Two phase clock pulses are applied with a logic return signal to the multiplexer through triax comprised of three thin film conductors deposited between layers. A lens focuses a scanned image onto the diode array for horizontal read out while a scanning mirror provides vertical scan.
Official Gazette of the U.S. Patent and Trademark Office



N84-33179*# National Aeronautics and Space Administration. Pasadena Office, Calif.
LOW LOSS SPLICING METHOD FOR SINGLE-MODE OPTICAL FIBER Patent Application
G. F. LUTES, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 7 Aug. 1984 8 p
(Contract NAS7-100)
(NASA-CASE-NPO-16294-1; NAS 1.71:NPO-16294-1; US-PATENT-APPL-SN-638585) Avail: NTIS HC A02/MF A01 CSCL 20F

An inexpensive method for accurately aligning and joining together two single-mode optical fibers is provided. A capillary tube is employed into which the fibers are inserted. One fiber is mounted in a micropositioner and its end is inserted into the tube a relatively short distance. The short insertion depth enables accurate alignment of the fibers, which are secured into place by an ultraviolet-cured epoxy. NASA



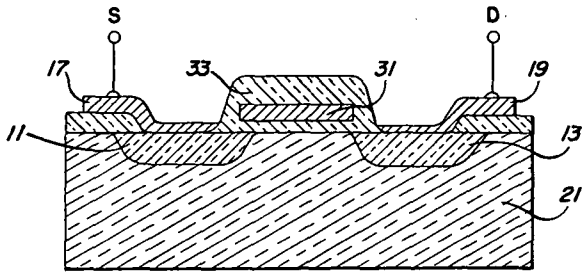
76

SOLID-STATE PHYSICS

Includes superconductivity.

N84-33211*# National Aeronautics and Space Administration. Pasadena Office, Calif.
FET CHARGE SENSOR AND VOLTAGE PROBE Patent Application
P. A. ROBINSON, JR., inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 16 Aug. 1984 14 p
(Contract NAS7-100)
(NASA-CASE-NPO-16045-1; NAS 1.71:NPO-16045-1; US-PATENT-APPL-SN-641146) Avail: NTIS HC A02/MF A01 CSCL 20L

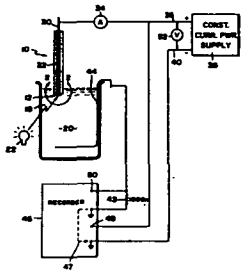
A simple, light, power-efficient solid state charge sensor usable for a variety of purposes in a variety of space environments is provided. This sensor comprises a mosfet structure provided with a biased gate formed under an insulator several times thicker than a typical mosfet passivating layer. Several such sensors having different gate materials and/or insulator thicknesses may be stacked to provide a particle spectrometer. Author



N84-35112*# National Aeronautics and Space Administration. Pasadena Office, Calif.
EPITAXIAL THINNING PROCESS Patent
C. M. SIEGEL, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 31 Jul. 1984 8 p Filed 6 Apr. 1982 Supersedes N82-26397 (20 - 17, p 2371) Sponsored by NASA
(NASA-CASE-NPO-15786-1; US-PATENT-4,462,871; US-PATENT-APPL-SN-366103; US-PATENT-CLASS-204-1T; US-PATENT-CLASS-204-56R; US-PATENT-CLASS-204-37.6; US-PATENT-CLASS-324-158D; US-PATENT-CLASS-324-158T) Avail: US Patent and Trademark Office CSCL 20L

A method is described for thinning an epitaxial layer of a wafer that is to be used in producing diodes having a specified breakdown voltage and which also facilitates the thinning process. Current is passed through the epitaxial layer, by connecting a current source between the substrate of the wafer and an electrolyte in which the wafer is immersed. When the wafer is initially immersed, the voltage across the wafer initially drops and then rises at a steep rate. When light is applied to the wafer the voltage drops, and when the light is interrupted the voltage rises again. These changes in voltage, each indicate the breakdown voltage of a Schottky diode that could be prepared from the wafer at that time. The epitaxial layer is thinned by continuing to apply current through the wafer while it is immersed and light is applied, to form an oxide film and when the oxide film is thick the wafer can then be cleaned of oxide and the testing and thinning continued. Uninterrupted thinning can be achieved by first forming an oxide film, and then using an electrolyte that dissolves the oxide about

as fast as it is being formed, to limit the thickness of the oxide layer. Official Gazette of the U.S. Patent and Trademark Office



N84-35113* National Aeronautics and Space Administration. Pasadena Office, Calif.

PROCESS AND APPARATUS FOR GROWING A CRYSTAL RIBBON Patent

J. W. THORNHILL, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 4 Sep. 1984 13 p Filed 23 Apr. 1982 Supersedes N82-26779 (17 - 20, p 2426) Sponsored by NASA (NASA-CASE-NPO-15629-1; US-PATENT-4,469,552; US-PATENT-APPL-SN-371351; US-PATENT-CLASS-156-608; US-PATENT-CLASS-156-617-SP; US-PATENT-CLASS-156-617-V; US-PATENT-CLASS-156-DIG.64; US-PATENT-CLASS-156-DIG.88; US-PATENT-CLASS-156-DIG.98; US-PATENT-CLASS-422-246; US-PATENT-CLASS-422-249) Avail: US Patent and Trademark Office CSCL 20B

A process and apparatus is disclosed for growing a crystal ribbon of a substance of theoretically infinite length from a melt of the substance. A pair of fixedly positioned edge defining members are partially submerged into the melt so as to break the surface of the melt at a predetermined distance from one another. The edge defining members are wettable by the melt and the predetermined distance substantially corresponds to the width of the crystal ribbon to be grown. The crystal ribbon is grown by contacting the surface of the melt with a seed ribbon between the edge defining members whereby a meniscus of the melt is established on the seed ribbon. The meniscus is stabilized by the meniscus of the melt on the edge defining members. Pulling the seed crystal ribbon away from the melt results in continuous growth of the crystal ribbon.

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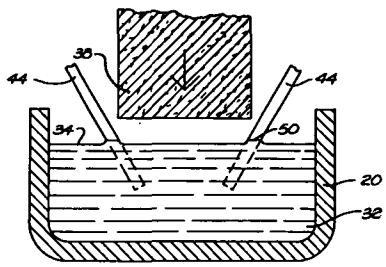

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15. Supplementary Notes

Section 1: Abstracts

16. Abstract

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