NASA SP-7039(20)
Section 1
Abstracts

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

JANUARY 1982

(NASA-SP-7039(20)-Sect-1) NASA PATENT ABSTRACTS BIBLIOGRAPHY. A CONTINUING BIBLIOGRAPHY, SECTION 1 (National Aeronautics and Space Administration) 60 p HC $15.00 CSCL 05B 00/82 N82-24132 Unclas 20297

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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

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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 1981 and December 1981.

Scientific and Technical Information Branch JANUARY 1982
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C.

This supplement is available as NTISUB/111/093 from the National Technical Information Service (NTIS), Springfield, Virginia 22161 at the price of $8.50 domestic; $17.50 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 165 citations published in this issue of the Abstract Section cover the period July 1981 through December 1981. The Index Section references approximately 4000 citations covering the period May 1969 through December 1981.

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 as depicted in the Typical Citation and Abstract reproduced below and are also used in the several indexes.

TYPICAL CITATION AND ABSTRACT

NASA SPONSORED DOCUMENT

AVAILABLE ON MICROFICHE

NASA ACCESSION NUMBER

N81-12283*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SOURCE

TITLE

BEAM CONNECTOR APPARATUS AND ASSEMBLY Patent Application

INVENTOR

Georg vonTiesenhausen, inventor (to NASA) Filed 8 Oct. 1980
13 p

NASA CASE NUMBER

(NASA-Case-MFS-25134-1; US-Patent-Appl-SN-195226) Avail: NTIS HC A02/MF A01 CSCL 13B

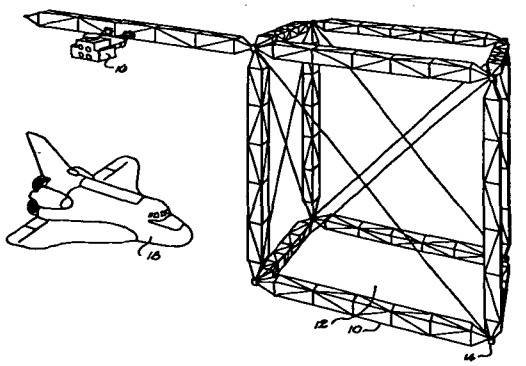
US PATENT APPLICATIONS SERIAL NUMBER

AVAILABILITY

COSATI CODE

ABSTRACT

A connector apparatus and assembly is described for connecting beams and the like structural members which is particularly advantageous for connecting two members together when moved laterally into place. The connector apparatus requires no relative longitudinal movement between the ends of the beams or members being connected to make a connection joint. The connector apparatus includes a receptacle member and a connector housing carried by opposed ends of the structural member being connected wherein a spring-loaded connector member is carried by the connector housing which may be released for extension and engagement into the receptacle member.
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 inventions(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 ($6.00 domestic; $12.00 foreign). Microfiche are sold at price code A01 ($4.00 domestic; $8.00 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.

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

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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.

SPACE SCIENCES

Includes space sciences (general); astronomy; astrophysics; lunar and planetary exploration; solar physics; and space radiation.
For related information see also *Geosciences.*

GENERAL

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

Section 2 • Indexes

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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.

For related information see also *34 Fluid Mechanics and Heat Transfer.*

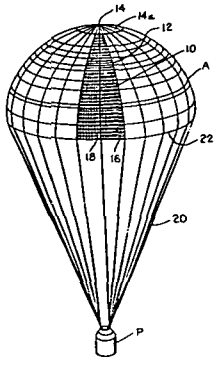
N81-26073*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

SYSTEM AND METHOD FOR REFURBISHING AND PROCESSING PARACHUTES Patent Application

Russell T. Crowell, inventor (to NASA) Filed 30 May 1980 19 p

(NASA-Case-KSC-11042-2; US-Patent-Appl-SN-154663) Avail: NTIS HC A02/MF A01 CSCL 01A

A system and method for refurbishing and processing parachutes is disclosed including an overhead monorail conveyor system on which the parachute is suspended for horizontal conveyance. The parachute is first suspended in a partially opened tented configuration wherein open inspection of the canopy is permitted to remove debris and inspect all areas. Following inspection, the parachute is transported by the monorail conveyor to a washing and drying station with the parachute canopy mounted on the conveyor in a systematic arrangement which permits water and air to pass through the ribbon-like materials of the canopy. Following drying, the chute is conveyed into an interior space where it is finally inspected and removed from the monorial conveyor for folding. The chute is once again mounted on the conveyor and conveyed to a packing area. NASA



03 AIR TRANSPORTATION AND SAFETY

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

For related information see also *16 Space Transportation* and *85 Urban Technology and Transportation.*

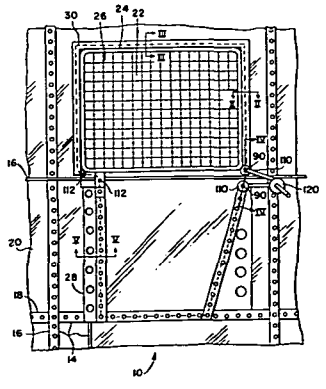
N81-29107*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EXPLOSIVELY ACTIVATED EGRESS AREA Patent Application

Laurence J. Bement and James W. Bailey, inventors (to NASA) (LTV Corp., Hampton, Va.) Filed 30 Apr. 1981 19 p

(NASA-Case-LAR-12624-1; US-Patent-Appl-SN-259209) Avail: NTIS HC A02/MF A01 CSCL 01C

A lightweight, add-on structure which smoothly cuts general aviation airframes along an egress area periphery, jettisoning the severed portion for rapid pilot egress is described. Flexible charges held against the airframe's interior cut the airframe while reaction surfaces, attached to the airframe's exterior within the periphery, restrict deformation of the skin. The reaction surfaces envelop an external containment cell which provides adequate space for cutting to occur; changing the volume and shape of the external containment cell alters the roughness of the cut. The reaction surfaces also receive impulse forces from the charge to jettison the severed portion of the airframe. Sealing walls and retention surfaces shield the airframe's interior from explosive forces. The pilot initiates the charges by rotating a bellcrank assembly which activates a lanyard-detonator. Safe pilot egress is improved by reducing the roughness of the egress area periphery, and increasing the distance which the severed portion is jettisoned. NASA



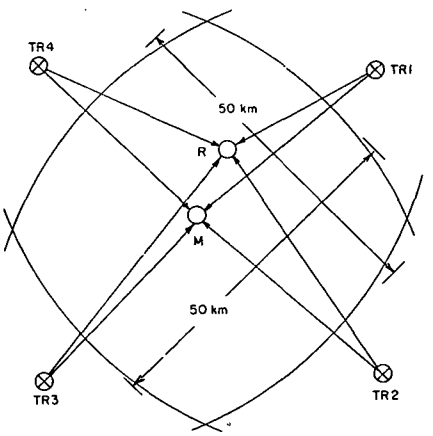
04 AIRCRAFT COMMUNICATIONS AND NAVIGATION

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

For related information see also 17 Spacecraft Communications, Command, and Tracking and 32 Communications.

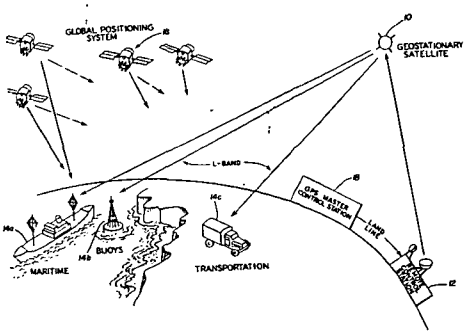
N81-22036*# National Aeronautics and Space Administration. Pasadena Office, Calif.
LOW-FREQUENCY RADIO NAVIGATION SYSTEM Patent Application
David E. Wallis, inventor (to NASA) (JPL) Filed 6 Mar. 1981 26 p
(Contract NAS7-100)
(NASA-Case-NPO-15264-1; US-Patent-Appl-SN-241154) Avail: NTIS HC A03/MF A01 CSCL 17G

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. NASA



N81-26085*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NAVIGATION SYSTEM AND METHOD Patent Application
J. W. Sennott (Howard Univ.) and R. E. Taylor Filed 22 May 1981 48 p
(Grant NGL-09-011-060)
(NASA-Case-GSC-12508-1; US-Patent-Appl-SN-266253) Avail: NTIS HC A03/MF A01 CSCL 17G

In a global positioning system (GPS), such as the NAVSTAR/GPS system, where 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. NASA



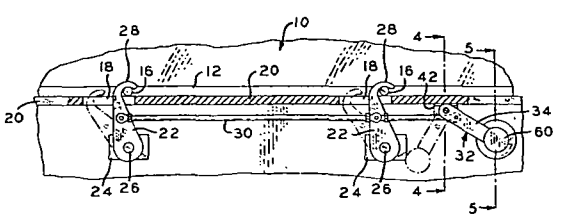
05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes aircraft simulation technology.

For related information see also 18 Spacecraft Design, Testing and Performance and 39 Structural Mechanics.

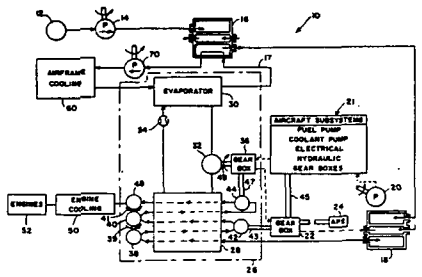
N81-24047*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
AIRCRAFT CANOPY LOCK Patent Application
George H. Nichols, inventor (to NASA) Filed 30 Mar. 1981 14 p
(NASA-Case-FRC-11065-1; US-Patent-Appl-SN-248744) Avail: NTIS HC A02/MF A01 CSCL 01C

A manually-operable lock for releasably securing a canopy in closed condition is characterized by (1) a pair of dogs mounted in fore-and-aft alignment on the wall of the cockpit of an aircraft; (2) a pair of dog receivers mounted on the canopy in juxtaposition with the dogs when the canopy is in its closed condition; (3) a dog-actuating arm including internal and external arm components, respectively, supported for oscillation about a common axis and pivotally connected to the dogs through a pitman rod for pivotally displacing the dog; (4) a spring-loaded pin mounted on the arm and adapted to be ramp-cammed and positioned in coaxial alignment with a receiving bore, when the arm is at the limit of its forward throw; and (5) pin-release means including external and internal components, respectively, for releasing the arm for pivotal displacement. NASA



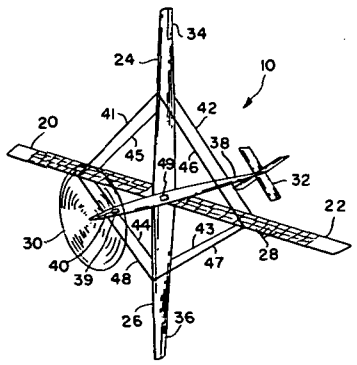
N81-26114* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
COOLING SYSTEM FOR HIGH SPEED AIRCRAFT Patent
Pierce L. Lawing (McDonnel Aircraft Co., St Louis) and LaVerne L. Pagel, inventors (to NASA) (McDonnell Aircraft Co., St. Louis) Issued 16 Jun. 1981 8 p Filed 31 Jan. 1979 Supersedes N79-24980 (17 - 16, p 2073) Sponsored by NASA
(NASA-Case-LAR-12406-1; US-Patent-4,273,304; US-Patent-Appl-SN-008210; US-Patent-Class-244-117A; US-Patent-Class-60-730; US-Patent-Class-60-267; US-Patent-Class-60-259; US-Patent-Class-62-DIG.5; US-Patent-Class-165-104.14; US-Patent-Class-244-163) Avail: US Patent and Trademark Office CSCL 01C

The system eliminates the necessity of shielding an aircraft airframe constructed of material such as aluminum. Cooling is accomplished by passing a coolant through the aircraft airframe, the coolant acting as a carrier to remove heat from the airframe. The coolant is circulated through a heat pump and a heat exchanger which together extract essentially all of the added heat from the coolant. The heat is transferred to the aircraft fuel system via the heat exchanger and the heat pump. The heat extracted from the coolant is utilized to power the heat pump. The heat pump has associated therewith power turbine mechanism which is also driven by the extracted heat. The power turbines are utilized to drive various aircraft subsystems, the compressor of the heat pump, and provide engine cooling.
Official Gazette of the U.S. Patent and Trademark Office



N81-32138*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SOLAR POWERED AIRCRAFT Patent Application
William H. Phillips, inventor (to NASA) Filed 15 May 1981 12 p
(NASA-Case-LAR-12615-1; US-Patent-Appl-SN-263829) Avail: NTIS HC A02/MF A01 CSCL 01C

A cruciform wing structure for a solar powered aircraft is described. Solar cells are mounted on horizontal wing surfaces. Wing surfaces with spanwise axis perpendicular to the horizontal surfaces maintain these surfaces normal to the Sun line by allowing the aircraft to be flown in a controlled pattern at a large bank angle. The solar airplane may be of conventional design with respect to fuselage, propeller and tail, or may be constructed around a core and driven by propeller mechanisms attached near the tips of the airfoils. NASA



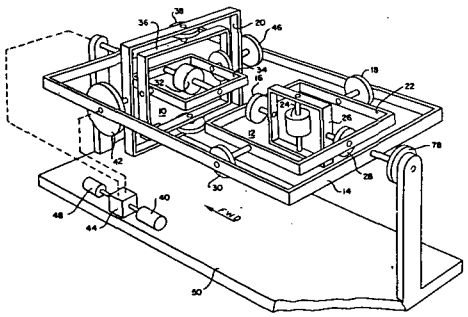
06 AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

For related information see also *19 Spacecraft Instrumentation* and *35 Instrumentation and Photography*.

N81-22048*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
AIRCRAFT BODY-AXIS ROTATION MEASUREMENT SYSTEM Patent Application
Kenneth T. Cowdin, inventor (to NASA) Filed 11 Mar. 1981 22 p
(NASA-Case-FRC-11043-1; US-Patent-Appl-SN-242790) Avail: NTIS HC A02/MF A01 CSCL 01D

A two-gyro four-gimbal attitude sensing system providing continuous aximuth information as the aircraft turns on its roll axis while the near vertical flight, and for preventing tumble of platforms in gyro systems upon departure from near vertical flight, is described. The provision of continuous azimuth information allows recovery from vertical on a desired heading. The system is comprised of means for stabilizing an outer roll gimbal that is common to a vertical gyro and a directional gyro with respect to the aircraft platform which is being angularly displaced about an axis substantially parallel to the outer roll gyro axis, and means for producing a signal indicative of the magnitude of such displacement as an indication of aircraft heading. Means are provided to cause stabilization of the outer roll gimbal prior to entering vertical flight and destabilization of the outer roll gimbal when departing vertical flight. J.D.H.



07 AIRCRAFT PROPULSION AND POWER

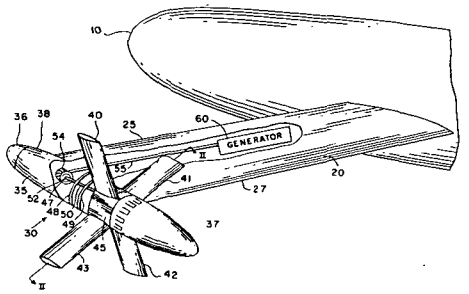
Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and on-board auxiliary power plants for aircraft.

For related information see also *20 Spacecraft Propulsion and Power*, *28 Propellants and Fuels*, and *44 Energy Production and Conversion*.

N81-27096*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
WINGTIP VORTEX TURBINE Patent Application
James C. Patterson, Jr., inventor (to NASA) Filed 16 Mar. 1981 14 p
(NASA-Case-LAR-12544-1; US-Patent-Appl-SN-243685) Avail: NTIS HC A02/MF A01 CSCL 01C

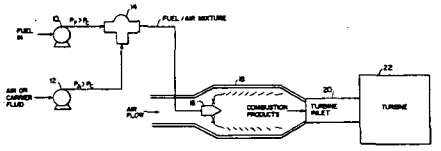
Means of extracting rotational energy from the vortex created at aircraft wing tips, of a turbine with four blades which are located in the cross flow of the vortex and attached downstream of the wing tip are described. The turbine blades are attached to a core. When the aircraft is in motion, the rotation of the

core transmits energy to a centrally attached shaft. The rotational energy thus generated is utlized within the airfoil or aircraft fuselage. E.A.K.



N81-29129* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SUPERCRITICAL FUEL INJECTION SYSTEM Patent
Cecil J. Marek and Larry P. Cooper, inventors (to NASA) Issued 26 Feb. 1980 4 p Filed 19 Jun. 1978 Supersedes N78-27122 (16 - 18, p 2353)
(NASA-Case-LEW-12990-1; US-Patent-4,189,914; US-Patent-Appl-SN-916654; US-Patent-Class-60-726; US-Patent-Class-60-39.06; US-Patent-Class-261-28; US-Patent-Class-431-2; US-Patent-Class-60-737) Avail: US Patent and Trademark Office CSCL 21E

A fuel injection system for gas turbines is described including a pair of high pressure pumps. The pumps provide fuel and a carrier fluid such as air at pressures above the critical pressure of the fuel. A supercritical mixing chamber mixes the fuel and carrier fluid and the mixture is sprayed into a combustion chamber. The use of fuel and a carrier fluid at supercritical pressures promotes rapid mixing of the fuel in the combustion chamber so as to reduce the formation of pollutants and promote cleaner burning.Official Gazette of the U.S. Patent and Trademark Office

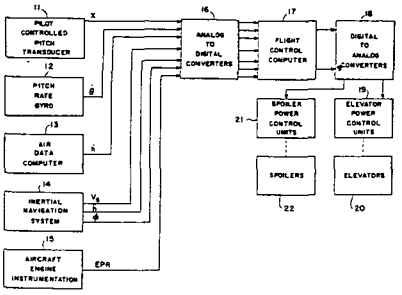


08 AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities; piloting; flight controls; and autopilots

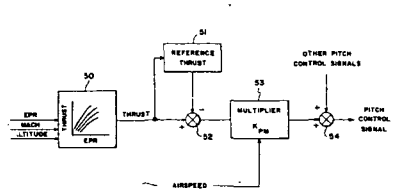
N81-24106* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
VELOCITY VECTOR CONTROL SYSTEM AUGMENTED WITH DIRECT LIFT CONTROL Patent
Henry F. Tisdale, Sr. (Tisdale (Henry F., Sr.), Treasure Island, Fla.) and Wendell W. Kelly, inventors (to NASA) (Tisdale (Henry F., Sr), Treasure Island, Fla.) Issued 14 Apr. 1981 6 p Filed 28 Feb. 1979 Supersedes N79-20136 (17 - 11, p 1394) Sponsored by NASA
(NASA-Case-LAR-12268-1; US-Patent-4,261,537; US-Patent-Appl-SN-015996; US-Patent-Class-244-181; US-Patent-Class-244-195; US-Patent-Class-318-584; US-Patent-Class-364-434) Avail: US Patent and Trademark Office CSCL 01C

A pilot-controlled stability control system that employs direct lift control (spoiler control) with elevator control to control the flight path angle of an aircraft is described. A computer on the aircraft generates an elevator control signal and a spoiler control signal, using a pilot-controlled pitch control signal and pitch rate, vertical velocity, roll angle, groundspeed, engine pressure ratio and vertical acceleration signals which are generated on the aircraft. The direct lift control by the aircraft spoilers improves the response of the aircraft flight path angle and provides short term flight path stabilization against environmental disturbances.
Official Gazette of the U.S. Patent and Trademark Office



N81-26152* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PITCH ATTITUDE STABILIZATION SYSTEM UTILIZING ENGINE PRESSURE RATIO FEEDBACK SIGNALS Patent
Wendell W. Kelley, inventor (to NASA) Issued 12 May 1981 7 p Filed 28 Feb. 1979 Supersedes N79-20135 (17 - 11, p 1394)
(NASA-Case-LAR-12562-1; US-Patent-4,266,743; US-Patent-Appl-SN-015995; US-Patent-Class-244-182; US-Patent-Class-244-181) Avail: US Patent and Trademark Office CSCL 01C

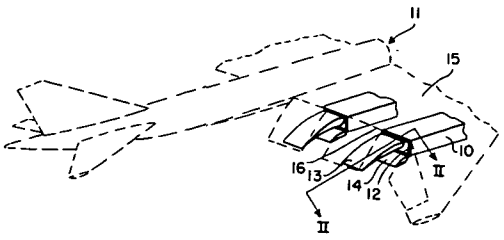
The changes in the engine pressure ratio signals which result from thrust changes are used to generate a pitch stabilization signal. The signal is combined with other pitch control signals to automatically counteract pitching moments resulting from the changes in engine thrust.
Official Gazette of the U.S. Patent and Trademark Office



N81-33210*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PROPULSIVE LATERAL CONTROL NOZZLE Patent Application
Paul L. Coe, Jr. and Albert B. Graham, inventors (to NASA) (Old Dominion Univ.) Filed 18 Nov. 1980 9 p
(NASA-Case-LAR-12136-1; US-Patent-Appl-SN-208093) Avail: NTIS HC A02/MF A01 CSCL 01C

The invention relates to a trailing edge flap system useful in increasing low speed lift and low speed roll control in supersonic aircraft. Two trailing edge flaps (upper and lower) extend from the aircraft's engine exhaust nozzle. In the high lift mode of operation, a diverter block pushes the upper flap away from the nozzle, thereby exposing a flow passageway. Exhaust flow through the passageway tends to decrease boundary layer separation.

To provide propulsive lateral control, the diverter block of one wing may be selectively closed, thereby reducing the lift on that wing. NASA



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.

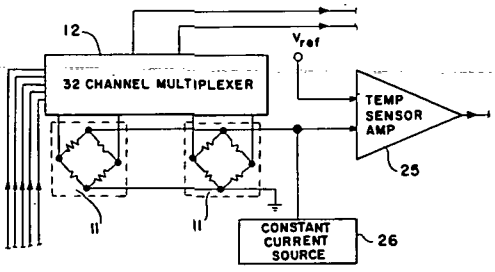
For related information see also *14 Ground Support Systems and Facilities (Space).*

N81-27121*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

A SELF-CORRECTING ELECTRONICALLY SCANNED PRESSURE SENSOR Patent Application

Chris Gross, inventor (to NASA) Filed 31 Mar. 1981 11 p (NASA-Case-LAR-12686-1; US-Patent-Appl-SN-249304) Avail: NTIS HC A02/MF A01 CSCL 14B

A multiple-channel high data rate pressure sensing device for use in wind tunnels, spacecraft, airborne, process control, automotive, pressure measurements, etc., is described. The device offers data rates in excess of 100,000 measurements per second with inaccuracies from temperature shifts less than 0.25% of full scale over a temperature span of 55 C. The device consists of 32 solid state sensors, signal multiplexing electronics to electronically address each sensor, and digital electronic circuitry to automatically correct the inherent thermal shift errors of the pressure sensors and their associated electronics. NASA

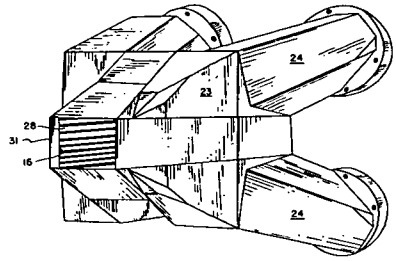


N81-29138*# *National Aeronautics and Space Administration.* Langley Research Center, Hampton, Va.

A RECTANGULAR ROD-WALL SOUND SHIELD Patent Application

Theodore R. Creel, Jr. and Ivan E. Beckwith, inventors (to NASA) Filed 28 May 1981 12 p (NASA-Case-LAR-12883-1; US-Patent-Appl-SN-267935) Avail: NTIS HC A02/MF A01 CSCL 14B

A test section for a supersonic or hypersonic wind tunnel is described. The section is shielded from the noise normally radiated by the turbulent tunnel wall boundary layer. A vacuum plenum surrounds spaced rod elements making up the test chamber. Some of the boundary layer formed along the rod elements during a test is thereby extracted to delay the tendency of the rod boundary layers to become turbulent. Novel rod construction involves bending. Each rod is bent prior to machining, providing a flat segment on each rod for connection with the flat entrance fairing. Rods and fairing are secured to provide a test chamber incline on the order of 1 deg outward from the noise shield centerline to produce up to a 65% reduction of the root-mean-square (rms) pressure over previously employed wind tunnel test sections at equivalent Reynolds numbers. NASA

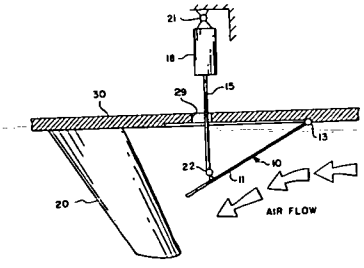


N81-31229*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AEROELASTIC INSTABILITY STOPPERS FOR WIND-TUNNEL MODELS Patent Application

Robert V. Doggett, Jr. and Rodney H. Ricketts, inventors (to NASA) Filed 17 Jun. 1981 11 p (NASA-Case-LAR-12720-1; US-Patent-Appl-SN-274706) Avail: NTIS HC A02/MF A01 CSCL 14B

A mechanism for diverting the flow in a wind tunnel from the wing of a tested model is described. The wing is mounted on the wall of a tunnel. A diverter plate is pivotally mounted on the tunnel wall ahead of the model. An actuator fixed to the tunnel is pivotably connected to the diverter plate, by plunger. When the model is about to become unstable during the test the actuator moves the diverter plate from the tunnel wall to divert flow about the wing and change the effective sweep angle thereof maintaining stable model conditions. The diverter plate is then retracted to enable normal flow. NASA



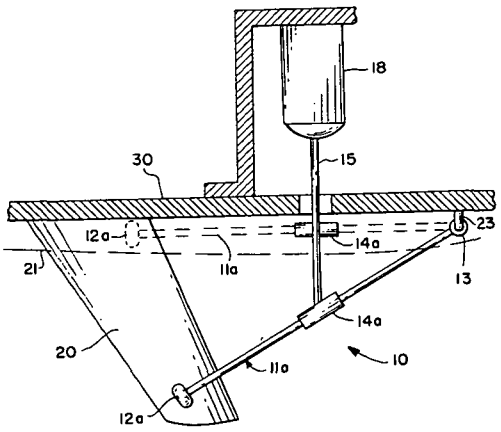
N81-31230*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AEROELASTIC INSTABILITY STOPPERS FOR WIND-TUNNEL MODELS Patent Application

Robert V. Doggett, Jr. and Rodney H. Ricketts, inventors (to NASA) Filed 17 Jun. 1981 10 p (NASA-Case-LAR-12458-1; US-Patent-Appl-SN-274705) Avail: NTIS HC A02/MF A01 CSCL 14B

A mechanism for constraining models or sections thereof, was wind tunnel tested, deployed at the onset of aeroelastic instability, to forestall destructive vibrations in the model is described. The mechanism includes a pair of arms pivoted to the tunnel wall and straddling the model. Rollers on the ends of the arms contact the model, and are pulled together against

the model by a spring stretched between the arms. An actuator mechanism swings the arms into place and back as desired.
NASA



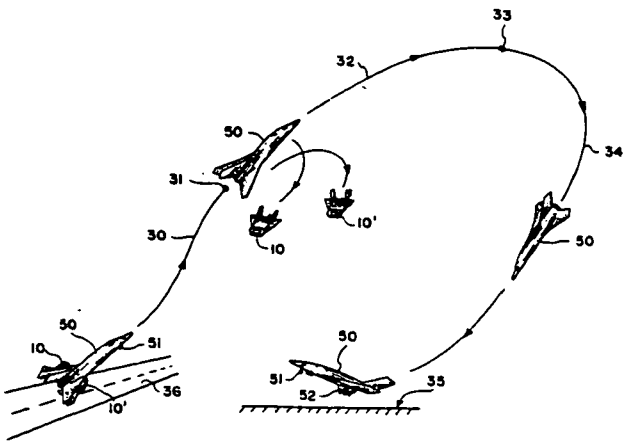
14 GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE)

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

For related information see also *09 Research Support Facilities (Air)*.

N81-26161* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ORBITER/LAUNCH SYSTEM Patent
Liam R. Jackson, John P. Weidner, William J. Small, and James A. Martin, inventors (to NASA) Issued 5 May 1981 6 p Filed 30 May 1978 Supersedes N78-25120 (17 - 16, p 2081)
(NASA-Case-LAR-12250-1; US-Patent-4,265,416; US-Patent-Appl-SN-910794; US-Patent-Class-244-2; US-Patent-Class-244-160; US-Patent-Class-244-63) Avail: US Patent and Trademark Office CSCL 22D

The system includes reusable turbojet propelled booster vehicles releasably connected to a reusable rocket powered orbit vehicle. The coupled orbiter-booster combination takes off horizontally and ascends to staging altitude and speed under booster power with both orbiter and booster wings providing lift. After staging, the booster vehicles fly back to Earth for horizontal landing and the orbiter vehicle continues ascending to orbit.Official Gazette of the U.S. Patent and Trademark Office



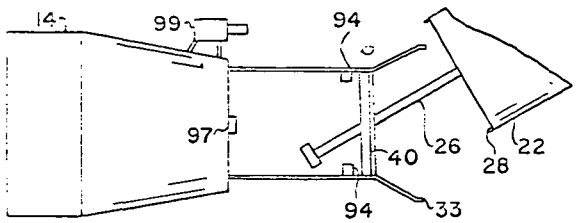
18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes spacecraft thermal and environmental control; and attitude control.

For life support systems see *54 Man/System Technology and Life Support*. For related information see also *05 Aircraft Design, Testing and Performance* and *39 Structural Mechanics*.

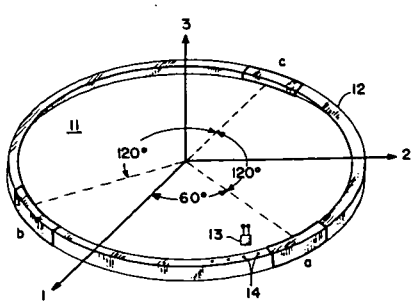
N81-24164*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
SATELLITE RETRIEVAL SYSTEM Patent Application
Edwin C. Pruett (Essex Corp., Alexandria, Va.), Kem B. Robertson, III (Essex Corp., Alexandria, Va.), and Tomas E. Loughhead, inventors (to NASA) (Essex Corp., Alexandria, Va.) Filed 30 Mar. 1981 10 p Sponsored by NASA
(NASA-Case-MFS-25403-1; US-Patent-Appl-SN-248745) Avail: NTIS HC A02/MF A01 CSCL 22B

Two pairs of coacting parallel bars are separately mounted in spaced parallel planes on the front of a spacecraft. The bars of one pair are at right angles to bars of the other pair, and together the two pairs of bars effect a variable aperture adapted to close around a rod extending from a second spacecraft to thereby effect the capture of the latter. NASA



N81-29152* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
RIM INERTIAL MEASURING SYSTEM Patent
Nelson J. Groom, Williard W. Anderson, and William H. Phillips, inventors (to NASA) Issued 28 Jul. 1981 10 p Filed 7 Dec. 1979 Supersedes N80-18019 (18 - 09, p 1090)
(NASA-Case-LAR-12052-1; US-Patent-4,281,384; US-Patent-Appl-SN-102002; US-Patent-Class-364-453; US-Patent-CLass-364-566; US-Patent-Class-73-178R; US-Patent-Class-73-510) Avail: U.S. Patent and Trademark Office CSCL 22B

The invention includes an angular momentum control device (AMCD) having a rim and several magnetic bearing stations. The AMCD is in a strapped down position on a spacecraft. Each magnetic bearing station comprises means, including an axial position sensor, for controlling the position of the rim in the axial direction; and means, including a radial position sensor, for controlling the position of the rim in the radial direction. A first computer receives the signals from all the axial position sensors and computes the angular rates about first and second mutually perpendicular axes in the plane of the rim and computes the linear acceleration along a third axis perpendicular to the first and second axes. A second computer receives the signals from all the radial position sensors and computes the linear accelerations along the first and second axes.
Official Gazette of the U.S. Patent and Trademark Office



23 CHEMISTRY AND MATERIALS (GENERAL)

Includes biochemistry and organic chemistry.

N81-29160* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CROSS-LINKED POLYVINYL ALCOHOL AND METHOD OF MAKING SAME Patent
Li-Chen Hsu, Dean W. Sheibley, and Warren H. Philipp, inventors (to NASA) Issued 9 Jun. 1981 4 p Filed 30 Apr. 1980
(NASA-Case-LEW-13101-2; US-Patent-4,272,470;
US-Patent-Appl-SN-145271; US-Patent-Appl-SN-971473;
US-Patent-Class-264-104; US-Patent-Class-260-17.4UC;
US-Patent-Class-429-27; US-Patent-Class-429-28;
US-Patent-Class-428-139; US-Patent-Class-429-249;
US-Patent-Class-429-253; US-Patent-Class-525-56;
US-Patent-Class-525-61) Avail: U.S. Patent and Trademark Office CSCL 07C

A film-forming polyvinyl alcohol polymer is mixed with a polyaldehyde-polysaccharide cross-linking agent having at least two monosaccharide units and a plurality of aldehyde groups per molecule, preferably an average of at least one aldehyde group per monosaccharide units. The cross-linking agent, such as a polydialdehyde starch, is used in an amount of about 2.5 to 20% of the theoretical amount required to cross-link all of the available hydroxyl groups of the polyvinyl alcohol polymer. Reaction between the polymer and cross-linking agent is effected in aqueous acidic solution to produce the cross-linked polymer. The polymer product has low electrical resistivity and other properties rendering it suitable for making separators for alkaline batteries.

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

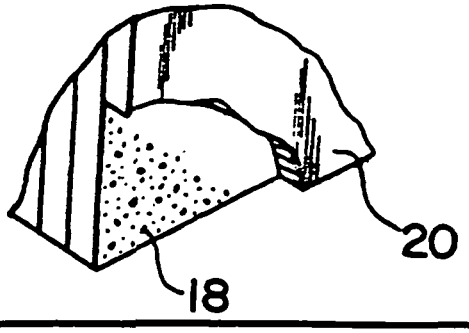
24 COMPOSITE MATERIALS

Includes laminates.

N81-26179* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD FOR ALLEVIATING THERMAL STRESS DAMAGE IN LAMINATES Patent
Charles A. Hoffman, John W. Weeton, and Norman W. Orth, inventors (to NASA) Issued 19 May 1981 5 p Filed 20 Feb. 1980 Division of US Patent Appl. SN-893857, filed 6 Apr. 1979, US Patent-4,211,354
(NASA-Case-LEW-12493-2; US-Patent-4,267,953;
US-Patent-Appl-SN-122967; US-Patent-4,211,354;
US-Patent-Appl-SN-893857; US-Patent-Class-228-118;
US-Patent-Class-228-190) Avail: US Patent and Trademark Office CSCL 11D

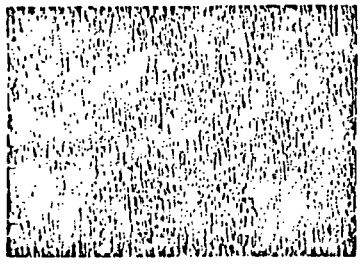
The method is for metallic matrix composites, such as laminated sheet or foil composites. Non-intersecting discrete discontinuities are positively introduced into the interface between the layers so as to reduce the thermal stress produced by unequal expansion of the materials making up the composite. The discontinuities are preferably produced by drilling holes in the metallic matrix layer. However, a plurality of discrete elements may be used between the layers to carry out this purpose.

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



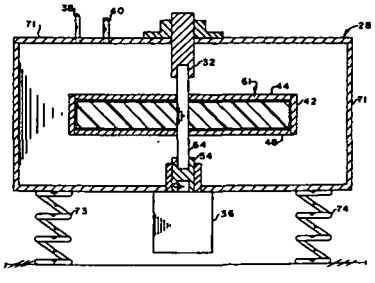
N81-27198*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ION SPUTTER TEXTURED GRAPHITE Patent Application
James S. Sovey, Ralph Forman, Arthur N. Curren, and Edwin G. Wintucky, inventors (to NASA) Filed 15 May 1981 14 p
(NASA-Case-LEW-12919-1; US-Patent-Appl-SN-264378) Avail: NTIS HC A02/MF A01 CSCL 11D

A specially textured surface of pyrolytic graphite which exhibits extremely low yields of secondary electrons and reduced numbers of reflected primary electrons after impingement of high energy primary electrons is described. An ion flux having an energy between 500 eV and 1000 eV 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 efficiency electron tube devices. NASA



N81-29163* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD OF MANUFACTURE OF BONDED FIBER FLYWHEEL Patent
George M. Weyler, Jr., inventor (to NASA) Issued 26 Feb. 1981 6 p Filed 5 Jun. 1978 Supersedes N78-27182 (16 - 18, p 2363)
(NASA-Case-MFS-23674-1; US-Patent-4,190,626;
US-Patent-Appl-SN-912276; US-Patent-Class-264-229;
US-Patent-Class-74-572; US-Patent-Class-156-74;
US-Patent-Class-156-161; US-Patent-Class-156-165;
US-Patent-Class-156-285; US-Patent-Class-156-294;
US-Patent-Class-264-231; US-Patent-Class-264-258;
US-Patent-Class-264-259; US-Patent-Class-264-311) Avail: US Patent and Trademark Office CSCL 11D

Layers of fiberglass cloth, generally forming a circular mass, are prestressed by rotation during the curing of epoxy which surrounds and thereby couples together fibers and layers of the cloth. Official Gazette of the U.S. Patent and Trademark Office



N81-29164*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
METHOD OF CARBONIZING POLYACRYLONITRILE FIBERS AND RESULTING PRODUCT Patent Application
Domenick E. Cagliostro and Narcinda R. Lerner, inventors (to NASA) Filed 10 Jul. 1981 13 p
(NASA-Case-ARC-11261-1; US-Patent-Appl-SN-282129) Avail: NTIS HC A02/MF A01 CSCL 11D

A method of carbonizing polyacrylonitrile fibers (PAN fibers) is described. The fibers are exposed at an elevated temperature to an oxidizing atmosphere, then to an atmosphere of an inert gas such as nitrogen containing a carbonaceous material such as acetylene. The fibers are preferably treated with a organic compounds, for example benzoic acid, before the exposure to an oxidizing atmosphere. NASA

N81-33235* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

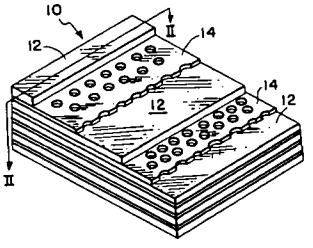
METHOD OF MAKING A PARTIAL INTERLAMINAR SEPARATION COMPOSITE SYSTEM Patent

Wolf Elber, inventor (to NASA) Issued 23 Jun. 1981 5 p Filed 7 Feb. 1980 Supersedes N81-16128 (19 - 07, p 0870) Division of US Patent Appl. SN-889671, filed 24 Mar. 1978, US Patent-4,229,473

(NASA-Case-LAR-12065-2; US-Patent-4,274,901; US-Patent-Appl-SN-119337; US-Patent-4,229,473; US-Patent-Appl-SN-889671; US-Patent-Class-156-242; US-Patent-Class-156-245; US-Patent-Class-156-252; US-Patent-Class-156-264; US-Patent-Class-156-285; US-Patent-Class-156-290) Avail: US Patent and Trademark Office CSCL 11D

An interlaminar separation system for composites is disclosed a thin layer of a perforated foil film is interposed between adjacent laminae of a composite formed from prepreg tapes. Laminae adherence takes place through the perforations and a composite structure with improved physical property characteristics is produced.

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



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25 INORGANIC AND PHYSICAL CHEMISTRY

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

For related information see also *77 Thermodynamics and Statistical Physics*.

N81-25159* National Aeronautics and Space Administration. Pasadena Office, Calif.

STARK EFFECT SPECTROPHONE FOR CONTINUOUS ABSORPTION SPECTRA MONITORING Patent

Michael J. Kavaya, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 3 Mar. 1981 7 p Filed 30 May 1980 Supersedes N80-25538 (18 - 16, p 2116) Sponsored by NASA

(NASA-Case-NPO-15102-1; US-Patent-4,253,769; US-Patent-Appl-SN-154726; US-Patent-Class-356-432; US-Patent-Class-250-350) Avail: US Patent and Trademark Office CSCL 07D

A Stark effect spectrophone using a pulsed or continuous wave laser having a beam with one or more absorption lines of a constituent of an unknown gas is described. The laser beam is directed through windows of a closed cell while the unknown gas to be modified flows continuously through the cell between electric field plates disposed in the cell on opposite sides of the beam path through the cell. When the beam is pulsed, energy absorbed by the gas increases at each point along the beam path according to the spectral lines of the constituents of the gas for the particular field strengths at those points. The pressure measurement at each point during each pulse of energy yields a plot of absorption as a function of electric field for simultaneous detection of the gas constituents. Provision for signal averaging and modulation is included.

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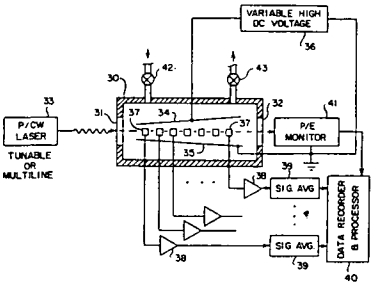


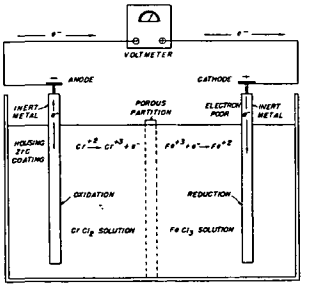
N81-26203*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ZIRCONIUM CARBIDE AS AN ELECTROCATALYST FOR THE CHROMOUS/CHROMIC REDOX COUPLE Patent Application

Randall F. Gahn, Margaret A. Reid, and Chiang Yuan Yang, inventors (to NASA) Filed 22 May 1981 17 p

(NASA-Case-LEW-13246-1; US-Patent-Appl-SN-266255) Avail: NTIS HC A02/MF A01 CSCL 07D

Zirconium carbide is used as a catalyst in a REDOX cell for the oxidation of chromous ions to chromic ions and for the reduction of chromic ions to chromous ions. The zirconium carbide is coated on an inert electronically conductive electrode which is present in the anode fluid of the cell. NASA



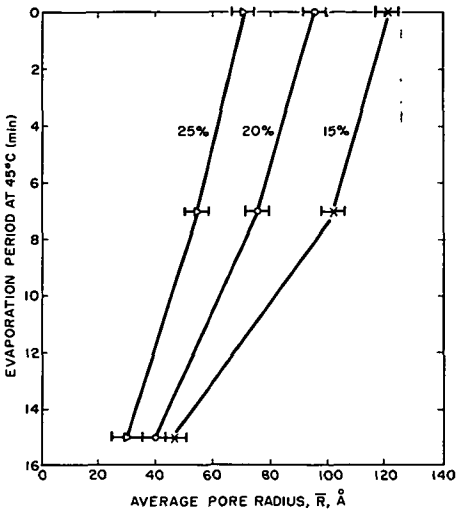
N81-29178*# National Aeronautics and Space Administration. Pasadena Office, Calif.

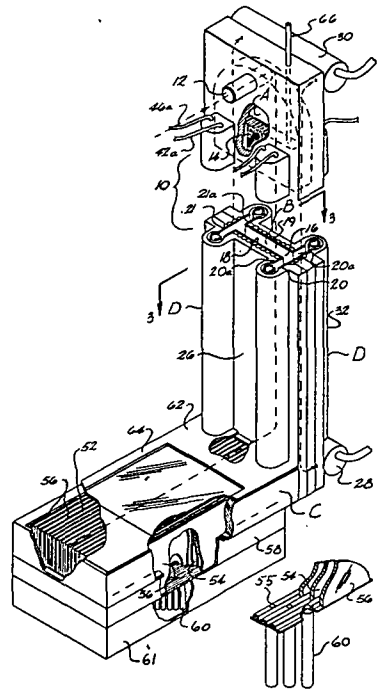
ASYMMETRIC POLYIMIDE SEPARATION MEMBRANE AND METHOD Patent Application

M. N. Sarbolouki, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 30 Apr. 1981 13 p (Contract NAS7-100)

(NASA-Case-NPO-15431-1; US-Patent-Appl-SN-259213) Avail: NTIS HC A02/MF A01 CSCL 07D

The production of an asymmetric separation membrane by solution casting phase inversion of an aromatic fully imidized polyimide is described. The imide is made from polycondensation of an aromatic tetracarboxylic acid and a mixture of aromatic diisocyanates. The imide is soluble in conventional isocyanate solvents. The membrane has particular application to ultrafiltration and other separation processes at elevated temperatures. This approach is also suitable for production of ultrafilters from other soluble polyimides such as those made from various combinations of aromatic tetracarboxylic dianhydrides and aromatic diamines. NASA





N81-29179*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

ELECTROPHORESIS DEVICE Patent Application

Percy H. Rhodes and Robert S. Snyder, inventors (to NASA) Filed 16 Apr. 1981 20 p

(NASA-Case-MFS-25426-1; US-Patent-Appl-SN-254575) Avail: NTIS HC A02/MF A01 CSCL 07D

Process efficiency is enhanced through the use of copper walls of high thermal conductivity and jackets for cooling the walls and controlling the thermal gradients in the separation chamber of an electrophoresis device which also includes a distribution chamber and a collection chamber. The distribution chamber has an inlet through which a buffer solution may enter and a series of conditioner tubes which straighten the buffer flow before it enters the separation chamber. Electrode assemblies, adjacent to the separation chamber. Electrode assemblies, adjacent to the separation chamber, include electrode chambers having a dialysis membrane portion through which an electrical field is impressed across the separation chamber. Passages separate the electrode and separation chambers so that flow variations and membrane variations around the slotted portion of the electrode chamber do not induce flow perturbations into the laminar buffer certain flowing in the separation chamber. A sample of the substance to be separated is inserted into a hollow tube that extends through the conditioner tubes and inserts the sample in the buffer flow after it is straightened and stabilized in the separation chamber. NASA

N81-29180*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

DENSIFICATION OF POROUS REFRACTORY SUBSTRATES Patent Application

Glenn M. Ecord and Calvin Schomburg, inventors (to NASA) Filed 22 May 1981 15 p

(NASA-Case-MSC-18737-1; US-Patent-Appl-SN-266256) Avail: NTIS HC A02/MF A01 CSCL 07D

A hydrolyzed tetraethyl orthosilicate is applied to the surface of a porous refractory substrate following which the substrate is heated to a temperature and for a period of time sufficient to bond the silica released from the tetraethyl orthosilicate to the substrate thereby densifying and strengthening the surface. NASA

N81-33246* National Aeronautics and Space Administration. Pasadena Office, Calif.

COAL DESULFURIZATION Patent

George C. Hsu, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 27 Mar. 1981 5 p Filed 16 Feb. 1978 Supersedes N78-33164 (16 - 24, p 3185) Sponsored by NASA

(NASA-Case-NPO-14272-1; US-Patent-4,146,367; US-Patent-Appl-SN-878253; US-Patent-Class-44-1R; US-Patent-Class-44-2; US-Patent-Class-201-17) Avail: US Patent and Trademark Office CSCL 07D

Organic sulfur is removed from coal by treatment with an organic solution of iron pentacarbonyl. Organic sulfur compounds can be removed by reaction of the iron pentacarbonyl with coal to generate CO and COS off-gases. The CO gas separated from COS can be passed over hot iron fillings to generate iron pentacarbonyl.

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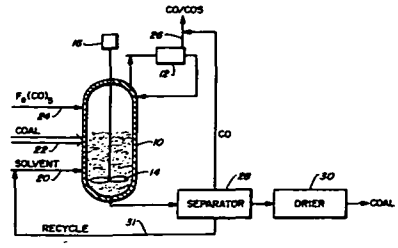

26 METALLIC MATERIALS

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

N81-25188* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CORROSION RESISTANT THERMAL BARRIER COATING Patent
Stanley R. Levine, Robert A. Miller, and Philip E. Hodge, inventors (to NASA) Issued 10 Mar. 1981 3 p Filed 31 Oct. 1979 Supersedes N80-11142 (18 - 02, p 0160)
(NASA-Case-LEW-13088-1; US-Patent-4,255,495; US-Patent-Appl-SN-089779; US-Patent-Class-428-632; US-Patent-Class-428-471; US-Patent-Class-428-678; US-Patent-Class-428-679; US-Patent-Class-428-680) Avail: US Patent and Trademark Office CSCL 11F

A thermal barrier coating system for protecting metal surfaces at high temperature in normally corrosive environments is described. The thermal barrier coating system includes a metal alloy bond coating, the alloy containing nickel, cobalt, iron, or a combination of these metals. The system further includes a corrosion resistant thermal barrier oxide coating containing at least one alkaline earth silicate. The preferred oxides are calcium silicate, barium silicate, magnesium silicate, or combinations of these silicates.

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

N81-24230*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD FOR DEPOSITING AN OXIDE COATING Patent Application
G. E. McDonald, inventor (to NASA) Filed 23 Mar. 1981 8 p
(NASA-Case-LEW-13131-1; US-Patent-Appl-SN-246772) Avail: NTIS HC A02/MF A01 CSCL 11F

A metal oxide coating is plated onto a metal substrate at the cathode from an acid solution which contains an oxidizing agent. The process is particularly useful for producing solar panels. Conventional plating at the cathode avoids the presence of oxidizing agents. Coatings made in accordance with the invention are stable both at high temperatures and while under the influence of high photon flux in the visible range. NASA

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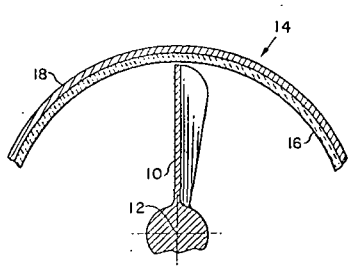
27 NONMETALLIC MATERIALS

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

N81-22190*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LASER SURFACE FUSION OF PLASMA SPRAYED CERAMIC TURBINE SEALS Patent Application
Donald W. Wisander and Robert C. Bill, inventors (to NASA) Filed 11 Mar. 1981 11 p
(NASA-Case-LEW-13269-1; US-Patent-Appl-SN-242795) Avail: NTIS HC A02/MF A01 CSCL 07C

An abradable lining that is deposited on a shroud forming a gas path seal in turbomachinery is described. Improved thermal shock resistance is effected through the deliberate introduction of microcracks which will not propagate appreciably upon exposure to the thermal shock environment in which a turbine seal must function. The microcracks are introduced by laser surface fusion treatment of the ceramic. 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 which precludes the formation of a catastrophic crack during thermal shock exposure. J.D.H.



N81-24256* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
BIFUNCTIONAL MONOMERS HAVING TERMINAL OXIME AND CYANO OR AMIDINE GROUPS Patent
Robert W. Rosser, Ibrahim M. Shalhoub (San Jose State Univ.), and Hanoi Kwongs, inventors (to NASA) (San Jose State Univ.) Issued 26 May 1981 5 p Filed 30 Apr. 1980 Division of US Patent Appl. SN-028301, filed 9 Apr. 1979
(NASA-Case-ARC-11253-3; US-Patent-4,269,787; US-Patent-Appl-SN-145283; US-Patent-Class-260-465.5R; US-Patent-Class-564-229; US-Patent-Class-528-310; ; US-Patent-Appl-SN-028301) Avail: US Patent and Trademark Office CSCL 07C

The preparation of crosslinked 1,2,4-oxadiazole elastomers is described. The technique involves thermally condensing (1) a monomer having the formula H2N(HON)C-R-Q, wherein Q is a triazine ring-forming groups such as nitrile or amidine or a mixture of such group with amidoxime, or (2) a mixture of the same monomer with R(C(NOH)NH2)2, with R in these formulas standing for a bivalent organic radical. In the monomer charge, the overall proportions of amidoxime groups to triazine ring-forming groups varies depending on the extent of crosslinking desired in the final polymer.

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

N81-24257* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IN-SITU CROSS LINKING OF POLYVINYL ALCOHOL Patent
Warren H. Philipp, L-Chen Hsu, and Dean W. Sheibley, inventors (to NASA) Issued 14 Apr. 1981 4 p Filed 18 Jan. 1980 Continuation of abandoned US Patent Appl. SN971475, filed 20 Dec. 1978
(NASA-Case-LEW-13135-2; US-Patent-4,262,067; US-Patent-Appl-SN-113014; US-Patent-Class-429-139; US-Patent-Class-429-27; US-Patent-Class-429-28; US-Patent-Class-429-249; US-Patent-Class-429-253; US-Patent-Class-264-104; US-Patent-Class-264-105; US-Patent-Class-525-61; US-Patent-Appl-SN-971475) Avail: US Patent and Trademark Office CSCL 07C

A method of producing a crosslinked polyvinyl alcohol structure, such as a battery separator membrane or electrode envelope is described. An aqueous solution of a film-forming polyvinyl alcohol is admixed with an aldehyde crosslinking agent a basic pH to inhibit crosslinking. The crosslinking agent, perferably a dialdehyde such as glutaraldehyde, is used in an amount of from about 1/2 to about 20% of the theoretical amount required to crosslink all of the hydroxyl groups of the polymer. The aqueous admixture is formed into a desired physical shape, such as by casting a sheet of the solution. The sheet is then dried to form a self-supporting film. Crosslinking is then effected by immersing the film in aqueous acid solution. The resultant product has excellent properties for use as a battery separator.

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

N81-24258* National Aeronautics and Space Administration. Pasadena Office, Calif.
POLYMERIC COMPOSITIONS AND THEIR METHOD OF MANUFACTURE Patent

Billy G. Moser (JPL) and Robert F. Landel, inventors (to NASA) (JPL) Issued 21 Mar. 1972 6 p Filed 22 Dec. 1967 Sponsored by NASA
(NASA-Case-NPO-10424-1; US-Patent-3,651,008; US-Patent-Appl-SN-692636; US-Patent-Class-260-37) Avail: US Patent and Trademark Office CSCL 07C

Filled polymer compositions are made by dissolving the polymer binder in a suitable sublimable solvent, mixing the filler material with the polymer and its solvent, freezing the resultant mixture, and subliming the frozen solvent from the mixture from which it is then removed. The remaining composition is suitable for conventional processing such as compression molding or extruding. A particular feature of the method of manufacture is pouring the mixed solution slowly in a continuous stream into a cryogenic bath wherein frozen particles of the mixture result. The frozen individual particles are then subjected to the sublimation.

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

N81-24265*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THERMAL BARRIER COATING SYSTEM HAVING IMPROVED ADHESION Patent Application
R. C. Bill and J. S. Sovey, inventors (to NASA) Filed 28 Jan. 1981 7 p
(NASA-Case-LEW-13359-1; US-Patent-Appl-SN-229233) Avail: NTIS HC A02/MF A01 CSCL 11A

A metallic bond coat on a substrate is primer coated by depositing an ion sputtered ceramic film. A ceramic thermal barrier coating is then plasma-sprayed onto this primer film. The sputter deposited primer coating improves the integrity and strength of the interface between the plasma-sprayed ceramic layer and metallic bond coat. Improvement of the integrity of the interface insures stronger adherence between the metal and the ceramic. NASA

N81-25209* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
METHOD FOR APPLYING PHOTOGRAPHIC RESISTS TO OTHERWISE INCOMPATIBLE SUBSTRATES Patent
Wolfgang Fuhr, inventor (to NASA) (United States Radium Corp. Parsippany, N.J.) Issued 14 Apr. 1981 4 p Filed 31 Oct. 1978 Supersedes N79-19319 (17 - 10, p 1279) Sponsored by NASA
(NASA-Case-MSC-18107-1; US-Patent-4,262,080; US-Patent-Appl-SN-956168; US-Patent-Class-430-271; US-Patent-Class-430-325; US-Patent-Class-430-329; US-Patent-Class-430-330) Avail: US Patent and Trademark Office CSCL 11A

A method for applying photographic resists to otherwise incompatible substrates, such as a baking enamel paint surface, is described wherein the uncured enamel paint surface is coated with a non-curing lacquer which is, in turn, coated with a partially cured lacquer. The non-curing lacquer adheres to the enamel and a photo resist material satisfactorily adheres to the partially cured lacquer. Once normal photo etching techniques are employed the lacquer coats can be easily removed from the enamel leaving the photo etched image. In the case of edge lighted instrument panels, a coat of uncured enamel is placed over the cured enamel followed by the lacquer coats and the photo resists which is exposed and developed. Once the etched uncured enamel is cured, the lacquer coats are removed leaving an etched panel.

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

N81-27271* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PROCESS FOR THE PREPARATION OF POLYCARBORANYLPHOSPHAZENES Patent
Harry R. Allcock (Pennsylvania State Univ., University Park), John P. Obran (Pennsylvania State Univ., University Park), Angelo G. Scopelianos (Pennsylvania State Univ., University Park), and Larry L. Fewell, inventors (to NASA) (Pennsylvania State Univ., University Park) Issued 30 Jun. 1981 3 p Filed 12 Mar. 1980 Supersedes N80-21464 (18 - 12, p 1541) Sponsored by NASA
(NASA-Case-ARC-11176-2; US-Patent-4,276,403; US-Patent-Appl-SN-129798; US-Patent-Class-528-4; US-Patent-Class-528-168; US-Patent-Class-528-399; US-Patent-Class-528-6) Avail: US Patent and Trademark Office CSCL 07C

A process for the preparation of polycarboranylphosphazenes is described. Polydihalophosphazenes are allowed to react at ambient temperatures for at least one hour with a lithium carborane in a suitable inert solvent. The remaining chlorine substituents of the carboranyl polyphosphazene are then replaced with aryloxy or alkoxy groups to enhance moisture resistance. The polymers give a high char yield when exposed to extreme heat and flame and can be used as insulation.

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

N81-27272* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PHOSPHORUS-CONTAINING BISIMIDE RESINS Patent
Indra K. Varma (NAS-NRC, Washington, D.C.), George M. Fohlen (NAS-NRC, Washington, D.C.), and John A. Parker, inventors (to NASA) (NAS-NRC, Washington, D.C.) Issued 30 Jun. 1981 4 p Filed 5 Aug. 1980 Supersedes N80-31551 (18 - 22, p 2976)
(NASA-Case-ARC-11321-1; US-Patent-4,276,344; US-Patent-Appl-SN-175452; US-Patent-Class-428-260; US-Patent-Class-428-367; 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) Avail: US Patent and Trademark Office CSCL 07C

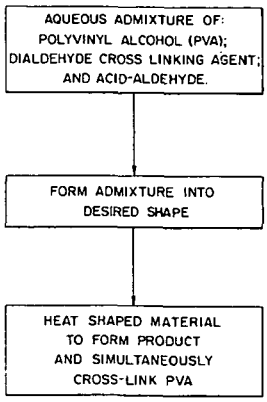
The production of fire-resistant resins particularly useful for making laminates with inorganic fibers such as graphite fibers is discussed. The resins are by (1) condensation of an ethylenically unsaturated cyclic anhydride with a bis(diaminophenyl) phosphine oxide, and (2) by addition polymerization of the bisimide so obtained. Up to about 50%, on a molar basis, of benzophenonetetracarboxylic acid anhydride can be substituted for some of the cyclic anhydride to alter the properties of the products. Graphite cloth laminates made with these resins show 800 C char yields greater than 70% by weight in nitrogen. Limiting oxygen indexes of more than 100% are determined for these resins.

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

N81-27279*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CROSS-LINKED POLYVINYL ALCOHOL AND METHOD OF MAKING SAME Patent Application
Dean W. Sheibley, Lorra L. Rieker, Li-Chen Hsu, and Michelle A. Manzo, inventors (to NASA) Filed 10 Jun. 1981 14 p
(NASA-Case-LEW-13504-1; US-Patent-Appl-SN-272234) Avail: NTIS HC A02/MF A01 CSCL 07C

A method is described for producing cross-linked polyvinyl alcohol battery separators. A film-forming polyvinyl alcohol resin is admixed, in aqueous solution, with a dialdehyde cross-linking agent which is capable of cross-linking the polyvinyl alcohol resin and a water soluble acid aldehyde. The acid aldehyde contains a reactive aldehyde group, capable of reacting with hydroxyl groups in the polyvinyl alcohol resin, and an ionizable acid hydrogen atom. The amount of acid aldehyde is from 1 to 5% by weight and is sufficient to reduce the pH of the aqueous admixture to 5 or less. The admixture is then formed into a

desired physical shape, such as by casting a sheet or film, and the shaped material is then heated to simultaneously dry and cross-link the article. NASA



N81-29229* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
TACKIFIER FOR ADDITION POLYIMIDES CONTAINING MONOETHYLPHTHALATE Patent
Terry L. St.Clair and John M. Butler, inventors (to NASA) (Virginia Polytechnic and State Univ., Blacksburg) Issued 28 Jul. 1981 6 p Filed 7 Nov. 1979 Supersedes N80-18179 (18 - 09, p 1114)
(NASA-Case-LAR-12642-1; US-Patent-4,281,102; US-Patent-Appl-SN-092141; US-Patent-Class-528-229; US-Patent-Class-264-137; US-Patent-Class-428-473.5; US-Patent-Class-528-222) Avail: U.S. Patent and Trademark Office CSCL 07C

An improvement of addition polyimides wherein an essentially solventless, high viscosity laminating resin is synthesized from low cost liquid monomers is disclosed. The improved process takes advantage of a reactive, liquid plasticizer such as monoethylphthalate (MEP) which is used in lieu of an alcohol solvent, and helps solve a major problem of maintaining good prepreg tack and drape, or the ability of the prepreg to adhere to adjacent plies and conform to a desired shape during the layup process. This improvement results in both longer life of the polymer prepreg and the processing of low void laminate and appears to be applicable to all addition polyimide systems.
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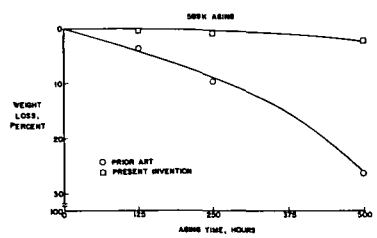
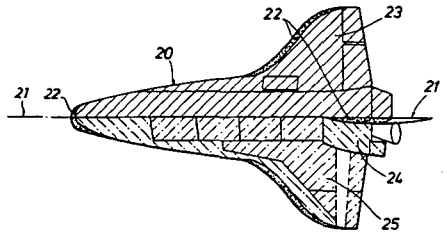


N81-29231*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
METHOD OF REPAIRING SURFACE DAMAGE TO POROUS REFRACTORY SUBSTRATES Patent Application
Glenn M. Ecord and Calvin Schomburg, inventors (to NASA) Filed 22 May 1981 14 p
(NASA-Case-MSC-18736-1; US-Patent-Appl-SN-266254) Avail: NTIS HC A02/MF A01 CSCL 07D

Damage to a porous refractory material coated with a glass coating such as the tiles on the space shuttle orbiter is repaired by (1) applying hydrolyzed tetraethyl orthosilicate to the damaged area; (2) curing the tetraethyl orthosilicate; (3) applying to damaged area a pliable filler comprised of hydrolyzed tetraethyl orthosilicate and powered refractory substrate; and (4) heating the damaged area to cure filler. NASA



N81-31363*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
RESIN COMPOSITION, PROCESS FOR PRODUCING THE SAME, PRODUCT PRODUCED THEREFROM AND PROCESS FOR PRODUCING SAID PRODUCT Patent Application
Demetrius A. Kourtides and John A. Parker, inventors (to NASA) Filed 30 Jul. 1981 24 p
(NASA-Case-ARC-11331-1; US-Patent-Appl-SN-288279) Avail: NTIS HC A02/MF A01 CSCL 07C

Flame and temperature resistant fiber reinforced panels are prepared by thermally curing, optionally in the presence of a thermal cure accelerating catalyst, a composition comprising a blend of diglycidyl ether or bis-(4-hydroxyhenyl)-fluorene, a novel compound, and diglycidyl ether of bisphenol A. Suitable catalysts are trimethoxyboroxine and ethyl triphenyl phosphonium iodide. The resin blend composition is simply thermally cured at temperatures of 149 C to 216 C, optionally in the presence of the catalyst which accelerates thermal curing, to produce a resin molding. The resin blend composition can also be used to impregnate reinforcing fibers such as glass cloth and graphite cloth to produce prepregs, and laminates of assemblies of these prepregs can be then cured under heat and pressure to produce reinforced composites suitable as panels in buildings, aircraft and ships. NASA

N81-31364*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PHOSPHORUS-CONTAINING IMIDE RESINS Patent Application
Indra K. Varma (NAS-NRC, Washington, D.C.), George M. Fohlen, and John A. Parker, inventors (to NASA) Filed 30 Jul. 1981 16 p
(NASA-Case-ARC-11368-1; US-Patent-Appl-SN-288267) Avail: NTIS HC A02/MF A01 CSCL 07C

Bis- and tris-imides derived from tris (m-aminophenyl) phosphine oxides by reaction with maleic anhydride or its derivatives, and 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. Such monomers or their oligomers may be used to impregnate fibers and fabrics which when cured, are flame resistant. Also an improved method of producing tris (m-aminophenyl) phosphine oxides from the nitro analogues by reduction with hydrazine hydrate using palladized charcoal or Raney nickel as the catalyst is described. NASA

28 PROPELLANTS AND FUELS

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

For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power,* and *44 Energy Production and Conversion.*

N81-24280* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
CELL AND METHOD FOR ELECTROLYSIS OF WATER AND

ANODE Patent
John R. Aylward, inventor (to NASA) (Hamilton Standard, Windsor Locks, Conn.) Issued 21 Apr. 1981 10 p Filed 20 Jun. 1980 Supersedes N80-26406 (18 - 17, p 2239) Sponsored by NASA
(NASA-Case-MSC-16394-1; US-Patent-4,263,112; US-Patent-Appl-SN-161255; US-Patent-Class-204-129; US-Patent-Class-204-290R; US-Patent-Class-204-290F; US-Patent-Class-204-291; US-Patent-Class-204-252; US-Patent-Class-204-266) Avail: US Patent and Trademark Office CSCL 21D

An electrolytic cell for converting water vapor to oxygen and hydrogen include an anode comprising a foraminous conductive metal substrate with a 65-85 weight percent iridium oxide coating and 15-35 weight percent of a high temperature resin binder. A matrix member contains an electrolyte to which a cathode substantially inert. The foraminous metal member is most desirably expanded tantalum mesh, and the cell desirably includes reservoir elements of porous sintered metal in contact with the anode to receive and discharge electrolyte to the matrix member as required. Upon entry of a water vapor containing airstream into contact with the outer surface of the anode and thence into contact with iridium oxide coating, the water vapor is electrolytically converted to hydrogen ions and oxygen with the hydrogen ions migrating through the matrix to the cathode and the oxygen gas produced at the anode to enrich the air stream passing by the anode.

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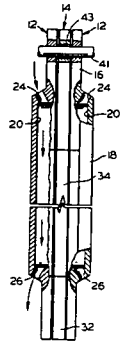

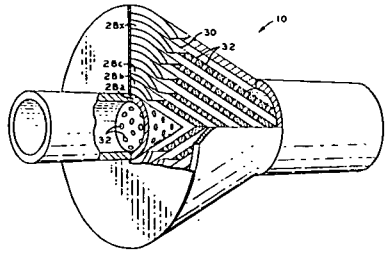

31 ENGINEERING (GENERAL)

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

N81-25258* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LIGHTWEIGHT STRUCTURAL COLUMNS Patent
Harold G. Bush, inventor (to NASA) Issued 7 Apr. 1981 9 p Filed 29 Jun. 1977 Supersedes N77-27432 (15 p 2393)
(NASA-Case-LAR-12095-1; US-Patent-4,259,821; US-Patent-Appl-SN-811401; US-Patent-Class-52-309.1; US-Patent-Class-52-648; US-Patent-Class-52-726; US-Patent-Class-244-158R; US-Patent-Class-403-171; US-Patent-Class-428-902) Avail: US Patent and Trademark Office CSCL 13B

Lightweight half-lengths of columns for truss structures are described. The columns are adapted for nestable storage and transport to facilitate fabrication of large area truss structures at a remote site and particularly adaptable for space applications.

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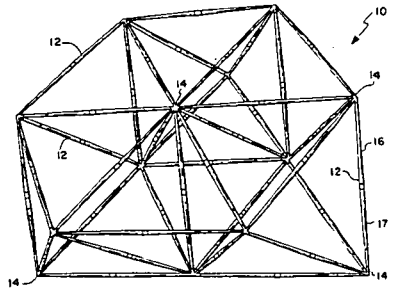

N81-33306*# National Aeronautics and Space Administration. Pasadena Office, Calif.
PRESSURE LETDOWN METHOD AND DEVICE FOR COAL CONVERSION SYSTEMS Patent Application
James M. Kendall, Sr. (JPL, California Inst. of Technology Pasadena) and John V. Walsh, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 30 Apr. 1981 18 p
(Contract NAS7-100)
(NASA-Case-NPO-15100-1; US-Patent-Appl-SN-259211) Avail: NTIS HC A02/MF A01 CSCL 21D

A pressure letdown device for a pressure dissipating system for a coal gasification reactor is described. The letdown device accepts a polyphase fluid at an entrance pressure and entrance velocity and discharges the fluid from the device at a discharge pressure substantially equal to the entrance temperature and entrance velocity. The device consists of a series of pressure letdown stages including a plurality of coaxially nested symmetrical baffles. The number of apertures or ports for each baffle plate is unique with respect to the number of apertures in each of the other baffles. The mass rate of flow for each port is a function of the area of the port, the pressure of the fluid as applied to the port, and a common pressure ratio established across the ports. NASA

N81-25259* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
FOLDABLE BEAM Patent
John M. Hedgepeth (Astro Research Corp., Carpinteria, Calif.), John V. Coyner (Astro Research Corp., Carpinteria, Calif.), and Robert F. Crawford (Astro Research Corp., Carpinteria, Calif.) Issued 7 Apr. 1981 8 p Filed 23 Feb. 1979 Supersedes N79-25425 (17 - 16, p 2136) Sponsored by NASA
(NASA-Case-LAR-12077-1; US-Patent-4,259,825; US-Patent-Appl-SN-014663; US-Patent-Class-52-645) Avail: US Patent and Trademark Office CSCL 13I

A foldable beam possessing superior qualities of light weight, compactness for transportation, quick deployment with minimum use of force, and high strength is described. These qualities are achieved through the use of a series of longitudinally rigid segments, hinged along one side and threaded by one or two cables along the opposite side. Tightening the cables holds the beam extended. Loosening the cables permits the segments to fold away from the threaded side. In one embodiment the segments are connected by canted hinges with the result that the beam may be folded in a helix-like configuration around a cylinder. In another embodiment the segments themselves may be hinged to fold flat laterally as the beam is folded, resulting

in a configuration that may be helixed around a shorter cylinder.

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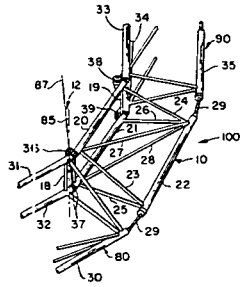

N81-27323* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

STRUCTURAL MEMBERS, METHOD AND APPARATUS Patent

Jack A. Kinzler, inventor (to NASA) Issued 9 Dec. 1980 21 p Filed 4 Apr. 1978 Supersedes N78-22146 (16 - 13, p 1672) (NASA-Case-MSC-16217-1; US-Patent-4,237,662; US-Patent-Appl-SN-893383; US-Patent-Class-52-108; US-Patent-Class-52-745) Avail: US Patent and Trademark Office CSCL 13B

A method and apparatus for fabricating a structural member such as truss from flexible sheet material in compacted form are disclosed. A number of generally tubular columns are progressively formed from the sheet material and deployed generally parallel to one another. Adjacent pairs of the columns are interconnected by respective side members, each of which is comprised of a strip of the sheet material. The sheet material is fastened together by self-attaching fasteners integrally formed from the sheet material of the columns and side members themselves.

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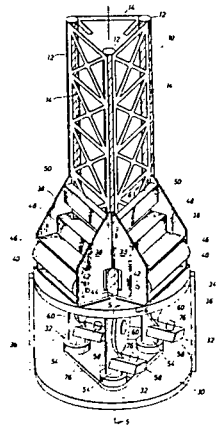

N81-27324* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

TELESCOPING COLUMNS Patent

John T. Mazur, inventor (to NASA) (Harris Corp., Melbourne, Fla.) Issued 16 Dec. 1980 8 p Filed 29 Sep. 1978 Supersedes N78-33446 (16 - 24, p 3222) Sponsored by NASA (NASA-Case-LAR-12195-1; US-Patent-4,238,911; US-Patent-Appl-SN-946991; US-Patent-Class-52-111; US-Patent-Class-52-632; US-Patent-Class-182-62.5; US-Patent-Class-212-267) Avail: US Patent and Trademark Office CSCL 13B

An extendable column is described which consists of several axially elongated rigid structural sections nested within one another. Each section includes a number of rotatably attached screws running along its length. The next inner section includes threaded lugs oriented to threadingly engage the screws. The column is extended or retracted upon rotation of the screws. The screws of each section are selectively rotated by a motor and an engagement mechanism.

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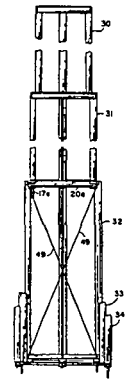
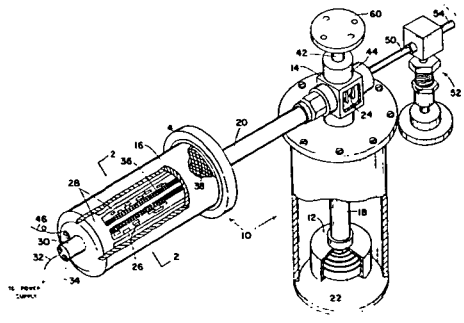


N81-27328*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

REFRIGERATOR MODULE, SYSTEM AND PROCESS Patent Application

Walter F. Brooks and Peter Kittel, inventors (to NASA) (National Academy of Sciences - National Research Council, Washington, D.C.) Filed 24 Jun. 1981 15 p (NASA-Case-ARC-11263-1; US-Patent-Appl-SN-276750) Avail: NTIS HC A02/MF A01 CSCL 13I

A hermetically sealed, valve-free assembly containing helium 3 or other refrigerant is used in a refrigerator module including a refrigerant evaporator, a refrigerant condenser, and a refrigerant adsorption pump serially connected but thermally isolated, so that the refrigerant may pass from one element to another. A heater is provided for the adsorption pump. During operation, the adsorbing unit is heated to drive adsorbed refrigerant vapor to the condenser. Refrigeration occurs when the refrigerant is evaporated in the evaporator and simultaneously adsorbed in the adsorbing unit to decrease refrigerant vapor pressure. When connected to the cold plate of a helium 4 or other refrigerant cryostat, the resulting multistage refrigeration system gives improved and simplified operation in practice. NASA



N81-33319* National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD AND APPARATUS FOR PRODUCING CONCENTRIC HOLLOW SPHERES Patent

Taylor G. Wang (JPL, California Inst. of Technology, Pasadena) and Daniel D. Elleman, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 21 Jul. 1981 6 p Filed 8 May 1979 Supersedes N79-24197 (17 - 15, p 1966) Sponsored by NASA (NASA-Case-NPO-14596-1; US-Patent-4,279,632;

US-Patent-Appl-SN-037072; US-Patent-Class-65-21.4; US-Patent-Class-65-22; US-Patent-Class-65-142; US-Patent-Class-264-5; US-Patent-Class-264-9; US-Patent-Class-264-24; US-Patent-Class-425-6) Avail: US Patent and Trademark Office CSCL 13H

Hollow spheres with precisely concentric inner and outer spherical surfaces are formed by applying vibrations to a nonconcentric hollow sphere while it is at an elevated temperature at which it is fluid or plastic, the vibrations producing internal flows which cause the inner and outer surfaces to become precisely concentric. Concentric spheres can be mass produced by extruding a material such as glass or metal while injecting a stream of gas into the center of the extrusion to form a gas-filled tube. Vibrations are applied to the extruded tube to help break it up into individual bodies of a desired uniform size, the bodies tending to form spherical inner and outer surfaces by reason of surface tension, and the continuing application of vibrations causing these surfaces to become concentric.

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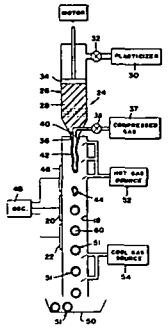

32 COMMUNICATIONS

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

For related information see also *04 Aircraft Communications and Navigation* and *17 Spacecraft Communications, Command and Tracking.*

N81-25278* National Aeronautics and Space Administration. Pasadena Office, Calif.

MULTIFREQUENCY BROADBAND POLARIZED HORN ANTENNA Patent

Kenneth A. Green, inventor (to NASA) (Microwave Research Corp.) Issued 24 Mar. 1981 12 p Filed 31 Jan. 1979 Supersedes N79-17067 (17 - 08, p 0968) Sponsored by NASA (NASA-Case-NPO-14588-1; US-Patent-4,258,366; US-Patent-Appl-SN-008209; US-Patent-Class-343-786; US-Patent-Class-343-755; US-Patent-Class-343-772; US-Patent-Class-343-781R) Avail: US Patent and Trademark Office CSCL 20N

A corrugated conical horn antenna is simultaneously fed a multiplicity of signals, two for each of five frequencies, with each of a pair of signals fed in each of two orthogonal planes for excitation of a desired spherical hybrid mode. The lowest frequency is fed into the horn through orthogonal pairs of colinear slots, each pair being fed by coaxial tee power dividers. Other signals are fed through a circular waveguide connected to the vertex. The highest frequency signals are fed through orthogonal ports near the far end of the circular waveguide. The intermediate frequency signals are fed through orthogonal ports spaced along the waveguide. Filtering is incorporated for each to maintain isolation and low insertion loss.

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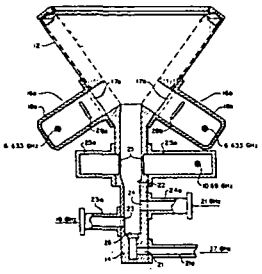

N81-27341* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

APPARATUS AND METHOD FOR DETERMINING THE POSITION OF A RADIANT ENERGY SOURCE Patent

Gustave J. Schaefer, inventor (to NASA) (Hughes Aircraft Co., Los Angeles) Issued 30 Jun. 1981 18 p Filed 24 Mar. 1977 Supersedes N77-20410 (15 - 11, p 1453) Sponsored by NASA (NASA-Case-GSC-12147-1; US-Patent-4,276,553; US-Patent-Appl-SN-780873; US-Patent-Class-343-112R) Avail: US Patent and Trademark Office CSCL 20N

The position of a terrestrial RF source is determined from a geostationary, synchronous satellite by scanning the beam of a narrow beam width antenna in first and second orthogonal directions over a region including the source. The peak level of energy transduced by the antenna in each of the scanning directions is detected and correlated with the scanning position of the beam by feeding the output of a detector responsive to the transduced signal to an indicator of an X-Y recorder. The X and Y axes of the recorder are scanned in synchronism with the beam being respectively scanned in the first and second directions to form X and Y traces on which are indicated the detected peak position in each of the scanning directions. The source position is determined from an intersection of lines drawn parallel to the X and Y axes and including the detected peak position of each trace.

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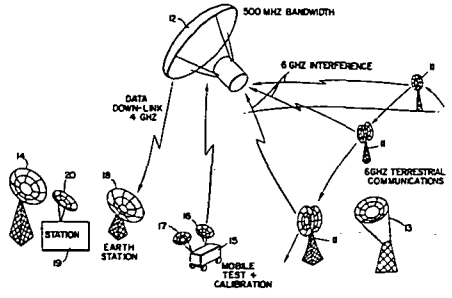


N81-29308* National Aeronautics and Space Administration. Pasadena Office, Calif.

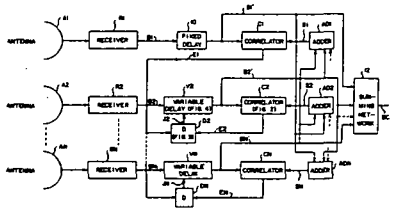
BASEBAND SIGNAL COMBINER FOR LARGE APERTURE ANTENNA ARRAY Patent

Mahlon E. Easterling (California Inst. of Technology, Pasadena) and Robin A. Winkelstein, inventors (to NASA) (California Inst. of Technology, Pasadena) Issued 14 Jul. 1981 11 p Filed 18 Sep. 1979 Supersedes N79-32408 (17 - 23, p 3073) Sponsored by NASA (NASA-Case-NPO-14641-1; US-Patent-4,278,978; US-Patent-Appl-SN-076643; US-Patent-Class-343-100CL; US-Patent-Class-455-278) Avail: U.S. Patent and Trademark Office CSCL 17B

The invention provides a means whereby the baseband output signals of all but one of the receivers associated with each of the antennas are summed and used as a correlation reference for the baseband signal not contained in the summed signal, thereby providing a plurality of correlation or alignment loops, each having an output signal related to the phase difference

between its input baseband signal and the summed signal. The invention further provides a means for subtracting an output or error signal generated in one of the correlation loops whose baseband signal has a predetermined phase delay from all the other alignment loops, thereby avoiding interaction and reflection effects in the signal combiner. A variable phase delay means for each of the other baseband signals is controlled by its corresponding correlation loop.

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



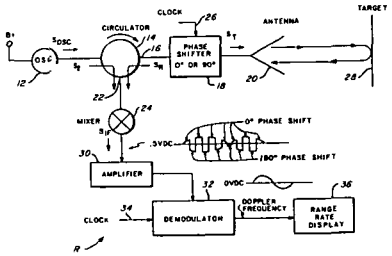
N81-29312*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

DOPPLER RADAR HAVING PHASE MODULATION OF BOTH TRANSMITTED AND REFLECTED RETURN SIGNALS

Herbert S. Kobayashi, Paul W. Shore, and Patrick Rozas, inventors (to NASA) 22 May 1981 15 p

(NASA-Case-MSC-18675-1; US-Patent-Appl-SN-266687) Avail: NTIS HC A02/MF A01 CSCL 17I

A microwave radar signal is generated for transmission through an antenna. Before transmission, the signal is phase modulated by 0 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 and IF doppler. The IF doppler signal may then by amplified, removing any requirement that direct current level signals be amplified and also removing the effect of detector noise from the Doppler signal. NASA



33 ELECTRONICS AND ELECTRICAL ENGINEERING

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

For related information see also *60 Computer Operations and Hardware* and *76 Solid-State Physics*.

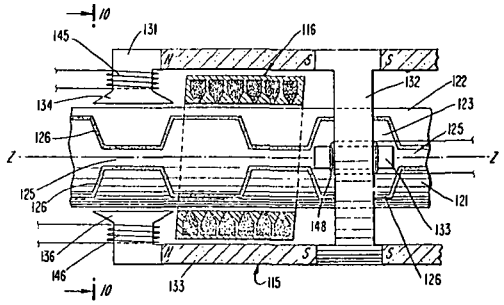
N81-22279*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

LINEAR MAGNETIC BEARING Patent Application

Philip A. Studer, inventor (to NASA) Filed 8 Dec. 1980 30 p

(NASA-Case-GSC-12517-1; US-Patent-Appl-SN-214361) Avail: NTIS HC A03/MF A01 CSCL 09C

A linear magnetic bearing system having electromagnet vernier flux paths in shunt relation with permanent magnets, so that the vernier flux does not traverse the permanent magnet, is described. Novelty is believed to reside in providing a linear magnetic bearing having electromagnet flux paths that bypass high reluctance permanent magnets. Particular novelty is believed to reside in providing a linear magnetic bearing with a pair of axially spaced elements having electromagnets for establishing vernier x and y axis control. The magnetic bearing system has possible use in connection with a long life reciprocating cryogenic refrigerator that may be used on the space shuttle. J.D.H.



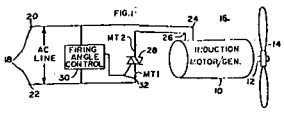
N81-22280*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

ELECTRICAL POWER GENERATING SYSTEM Patent Application

Frank J. Nola, inventor (to NASA) Filed 16 Mar. 1981 10 p

(NASA-Case-MFS-25302-1; US-Patent-Appl-SN-253021) Avail: NTIS HC A02/MF A01 CSCL 09C

An alternating current power generation system adopted to inject power in an already powered power line is discussed. The power generating system solves to adjustably coup an induction motor, as a generator, to an ac power line wherein the motor and power line are connected through a triac. The triac is regulated to normally turn on at a relatively late point in each half cycle of its operation, whereby at less than operating speed, and thus when the induction motor functions as a motor rather than as a generator, power consumption from the line is substantially reduced. The principal application will be for windmill powered generation. NASA



N81-24338* National Aeronautics and Space Administration. Pasadena Office, Calif.

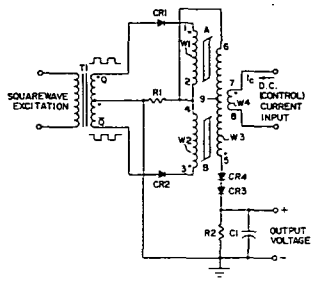
LOW CURRENT LINEARIZATION OF MAGNETIC AMPLIFIER FOR dc TRANSDUCER Patent

Satoshi Nagano, inventor (to NASA) (JPL) Issued 14 Apr. 1981 6 p Filed 22 Jun. 1979 Supersedes N79-26311 (17 - 17, p 2256) Sponsored by NASA

(NASA-Case-NPO-14617-1; US-Patent-4,262,259; US-Patent-Appl-SN-051269; US-Patent-Class-330-8) Avail: US Patent and Trademark Office CSCL 09A

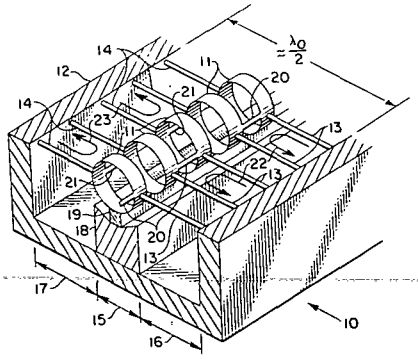
A magnetic amplifier having two saturable reactor cores with a separate excitation winding on each connected in series opposition, a common control winding, and a common output winding, is adapted for use as a low level signal transducer. The separate excitation windings are excited in push-pull mode through a center tapped transformer, and at least one diode is included in series with a load resistor connected to the output winding. A resistor in series with the output winding and load resistor is connected between the center tap of the excitation transformer and the connection between the two excitation windings of the saturable cores. This series resistor provides a return current path for the output winding and allows the excitation windings of the saturable cores to operate as primary windings

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



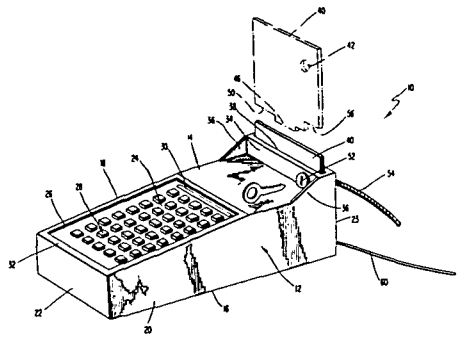
N81-24348*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LADDER SUPPORTED RING BAR CIRCUIT Patent Application
H. G. Kosmahl, inventor (to NASA) Filed 3 Apr. 1981 11 p (NASA-Case-LEW-13570-1; US-Patent-Appl-SN-251009) Avail: NTIS HC A02/MF A01 CSCL 09A

An improved slow wave circuit especially useful in backward wave oscillators is comprised of rings disposed between and attached to respective stubs which are themselves attached to opposing sidewalls of the waveguide. To the end that opposed, interacting magnetic fields will be established to provide a very high coupling impedance for the slow wave structure, axially orientated bars are connected between rings in alternate spaces and adjacent to the attachment points of stubs. Similarly, axial bars are connected between rings in the spaces which do not include bars and at points adjacent to the attachments of bars. The rings may be half rings of 180 deg arc and may be formed of flat metal ribbons. NASA



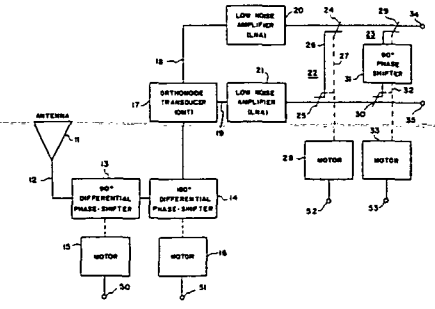
N81-25299* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PORTABLE APPLIANCE SECURITY APPARATUS Patent
James J. Kerley, inventor (to NASA) Issued 24 Feb. 1981 7 p Filed 17 Nov. 1978 Supersedes N79-13261 (17 - 04, p 0446)
(NASA-Case-GSC-12399-1; US-Patent-4,252,007; US-Patent-Appl-SN-961831; US-Patent-Class-70-58) Avail: US Patent and Trademark Office CSCL 09B

An apparatus for securing a small computer, or other portable appliance, against theft is described. It is comprised of a case having an open back through which the computer is installed or removed. Guide members in the form of slots are formed in a rear portion of opposite walls of the case for receiving a back plate to cover the opening and thereby secure the computer within the case. An opening formed in the top wall of the case exposes the keyboard and display of the computer. The back plate is locked in the closed position by a key-operated plug type lock. The lock is attached to one end of a hold down cable, the opposite end thereof being secured to a desk top or other stationary object. Thus, the lock simultaneously secures the back plate to the case and retains the case to the stationary object. Official Gazette of the U.S. Patent and Trademark Office



N81-26358* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ADAPTIVE POLARIZATION SEPARATION Patent
Guy M. Pelchat (Harris Corp., Melbourne, Fla.), George G. Rassweiler (Harris Corp., Melbourne, Fla.), Anthony-Gianatasio (Harris Corp., Melbourne, Fla.), and Lock R. Young, inventors (to NASA) (Harris Corp., Melbourne, Fla.) Issued 28 Apr. 1981 6 p Filed 6 Mar. 1979 Supersedes N79-18154 (17 - 09, p 1118) Sponsored by NASA
(NASA-Case-LAR-12196-1; US-Patent-4,264,908; US-Patent-Appl-SN-017887; US-Patent-Class-343-100PE) Avail: US Patent and Trademark Office CSCL 09C

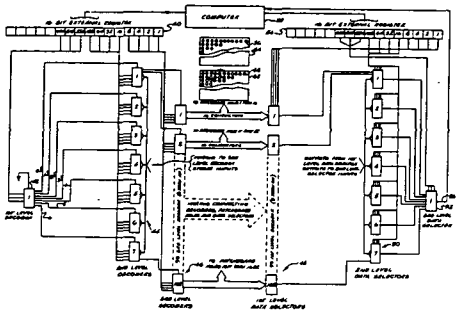
A broadband adaptively controlled polarization separation network is discussed. Two transmitted signals vertically and horizontally polarized are received as elliptically polarized signals. If there is any vertical polarization on the other signal the separation network provides two signals. The separation is done automatically by the use of two sets of crosscouplers which couple a single line to the other line to complete the polarization decoupling operation.
Official Gazette of the U.S. Patent and Trademark Office



N81-26359* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
DECOMMUTATOR PATCHBOARD VERIFIER Patent
John W. Brunson, inventor (to NASA) Issued 12 May 1981 7 p Filed 22 Jun. 1979 Supersedes N79-27865 (17 - 18, p 2462)
(NASA-Case-KSC-11065-1; US-Patent-4,267,594; US-Patent-Appl-SN-051271; US-Patent-Class-371-20; US-Patent-Class-371-25; US-Patent-Class-324-51; US-Patent-Class-324-73AT) Avail: US Patent and Trademark Office CSCL 09C

A system for automatically verifying the connections between

terminals of a patchboard is described. The system includes a back plane having a plurality of plugs corresponding to the pins of the patchboard. A number of decoders are connected to the plugs of the back plane so that a signal can be sequentially applied to each plug of the back plane under control of a stepping register and a control circuit. A plurality of data selectors are also connected to the plugs of the back plane and under control of a second external register. This control circuit sequentially makes connections between an output circuit and the plugs of the back plane so as to patch the signal applied to a respective plug through a patch connection to the output circuit. The precise locations of the patches on the patchboard can be identified and compared with previously stored information in a memory unit. Official Gazette of the U.S. Patent and Trademark Office



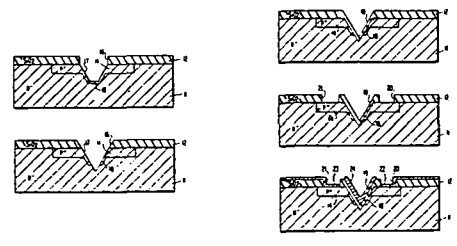
N81-26360* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

METHOD OF MAKING V-MOS FIELD EFFECT TRANSISTORS UTILIZING A TWO-STEP ANISOTROPIC ETCHING AND ION IMPLANTATION Patent

Murzban D. Jhabvala, inventor (to NASA) Issued 9 Jun. 1981 6 p Filed 5 Sep. 1979 Supersedes N80-12281 (18 - 03, p 0318)
(NASA-Case-GSC-12515-1; US-Patent-4,272,302; US-Patent-Appl-SN-172727; US-Patent-Class-148-1.5; US-Patent-Class-29-571; US-Patent-Class-29-578; US-Patent-Class-29-580; US-Patent-Class-148-187; US-Patent-Class-156-647; US-Patent-Class-156-648; US-Patent-Class-156-649; US-Patent-Class-357-23; US-Patent-Class-357-55; US-Patent-Class-357-60; US-Patent-Class-357-91) Avail: US Patent and Trademark Office CSCL 09A

A method of making V-MOS field effect transistors is disclosed wherein a masking layer is first formed over a surface of a crystalline substrate. An aperture is then formed in the masking layer to expose the surface of the substrate. An anisotropic etchant is applied to the exposed surface so that a groove having a decreasing width within increasing depth is formed. However, the etch is not allowed to go to completion with the result that a partially formed V-shaped groove is formed. Ions are accelerated through the aperture for implantation in the crystalline substrate in the lower portion of the partially formed V-shaped groove. Thereafter, an anisotropic etchant is reapplied to the partially formed V-shaped groove, and the etch is allowed to go to completion.

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

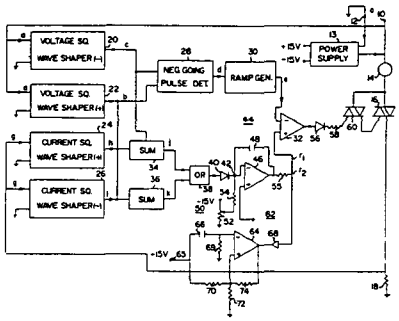


N81-27395* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

POWER FACTOR CONTROL SYSTEM FOR ac INDUCTION MOTORS Patent

F. J. Nola, inventor (to NASA) Issued 5 May 1981 8 p Filed 1 Jun. 1979 Supersedes N79-25315(17 - 16, p 2121)
(NASA-Case-MFS-23988-1; US-Patent-4,266,177; US-Patent-Appl-SN-044431; US-Patent-Class-318-810; US-Patent-Class-318-799; US-Patent-Class-307-252UA) Avail: US Patent and Trademark Office CSCL 09C

A power control circuit for an induction motor is disclosed in which a servo loop is used to control power input by controlling the power factor of motor operation. The power factor is measured by summing the voltage and current derived square wave signals. Official Gazette of the U.S. Patent and Trademark Office

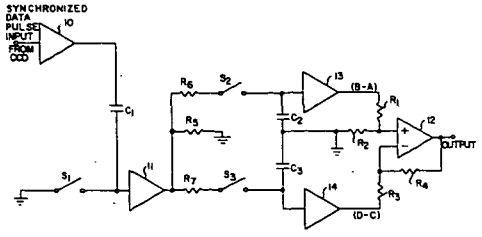


N81-27396* National Aeronautics and Space Administration. Pasadena Office, Calif.

CCD CORRELATED QUADRUPLE SAMPLING PROCESSOR Patent

Steve D. Gaalema, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 14 Apr. 1981 9 p Filed 6 Feb. 1979 Sponsored by NASA
(NASA-Case-NPO-14426-1; US-Patent-4,262,258; US-Patent-Appl-SN-009889; US-Patent-Class-328-151; US-Patent-Class-307-352; US-Patent-Class-307-353) Avail: US Patent and Trademark Office CSCL 09A

A correlated quadruple sampling processor for improved signal-to-noise ratio in the output of a charge-coupled device (CCD) is comprised of: switching means for momentarily clamping a CCD signal line at a first reference level A before a CCD data pulse and then obtaining a first data sample B with respect to the reference A during a CCD data pulse, and storing the positive sample B-A; switching means for momentarily clamping the CCD signal line a second time at the level C during the presence of the CCD data pulse and then obtaining a second data sample D with respect to the reference level C after the CCD data pulse, and storing the negative sample D-C; and means for obtaining the difference between the stored samples +(B-A) and -(D-C), thus increasing the net signal amplitude by a factor of about 2 while the noise would be increased by only a factor of square root of 2 since there will be no correlation in the noise between the double samples +(B-A) and -(D-C) effectively added. Official Gazette of the U.S. Patent and Trademark Office



N81-27397* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

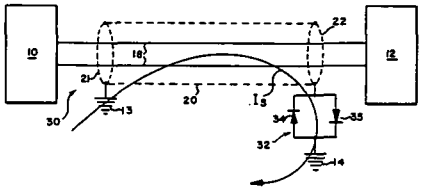
SHIELDED CONDUCTOR CABLE SYSTEM Patent

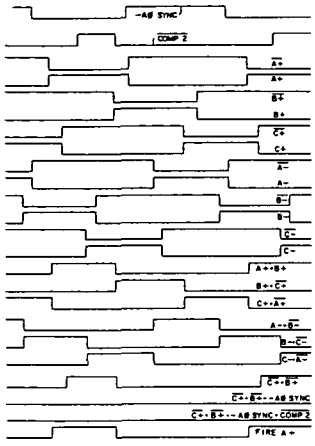
Kent D. Castle, inventor (to NASA) Issued 28 Apr. 1981 4 p Filed 30 Nov. 1976 Supersedes N77-13338 (15 - 04, p 0465)

(NASA-Case-MSC-12745-1; US-Patent-4,264,940; US-Patent-Appl-SN-746579; US-Patent-Class-361-91; US-Patent-Class-179-78; US-Patent-Class-333-12; US-Patent-Class-361-56) Avail: US Patent and Trademark Office CSCL 09A

A cable system carries one or more insulated conductors completely enclosed within a shield having one end connected to ground. A lightning protector network connects the other end of the shield to ground. The protector network is normally open circuited and becomes only short circuited in response to a momentary abnormal surge voltage induced in the shield. The protector network's open to short impedance change completes a conductive circuit path between the shield and the two grounded ends for conducting a shield current which has the desired effect of protecting the signal carrying conductors in the cable from the large surge voltage.

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





N81-27402*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

COMBINATIONAL LOGIC FOR GENERATING GATE DRIVE SIGNALS FOR PHASE CONTROL RECTIFIERS Patent Application

Carlisle R. Dolland (Garrett Corp., Los Angeles) and Daniel W. Trimble, inventors (to NASA) (Garrett Corp., Los Angeles) Filed 30 Jun. 1981 21 p Sponsored by NASA

(NASA-Case-MFS-25208-1; US-Patent-Appl-SN-280154) Avail: NTIS HC A02/MF A01 CSCL 09A

Control signals for phase delay rectifiers, which require a variable firing angle that ranges from 0 to 180 deg are derived from line to line 3 phase signals and both positive and negative firing angle control signals which are generated by comparing current command and actual current. Line to line phases are transformed into line to neutral phases and integrated to produce 90 deg phase delayed signals that are inverted to produce three cosine signals, such that for each its maximum occurs at the intersection of positive half cycles of the other two phases which are inputs to other inverters. At the same time, both positive and negative (inverted) phase sync signals are generated for each phase by comparing each with the next and producing a squarewave when it is greater. Ramp, sync and firing angle control signals are then used in combinational logic to generate the gate firing control signals for SCR gate drives which fire SCR devices in a bridge circuit. NASA

N81-27403*# National Aeronautics and Space Administration. Pasadena Office, Calif.

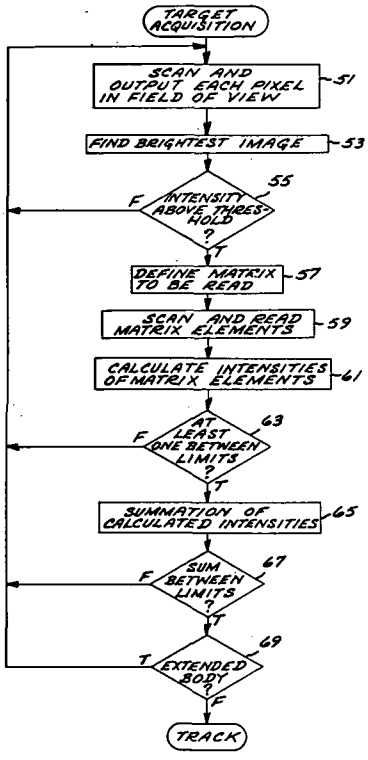
PROGRAMMABLE SCAN/READ CIRCUITRY FOR CHARGE COUPLED DEVICE IMAGING DETECTORS Patent Application

Phil M. Salomon (JPL, California Inst. of Technology, Pasadena) and Kalman Smilowitz, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 24 Jun. 1981 26 p

(NASA-Case-NPO-15345-1; US-Patent-Appl-SN-276749) Avail: NTIS HC A03/MF A01 CSCL 09A

A circuit is disclosed for scanning and outputting the induced charges in a solid state charge coupled device (CCD) image detector for use in a spacecraft attitude control system. The image detection system includes timing control circuitry for selectivity controlling the output of the CCD detector so that video outputs are provided only with t to induced charges correspondin to predetermined sensing element lines of the CCD detector. The system also includes an analog to digital converter for converting selected video outputs from the CCD detectoro. 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. NASA



N81-29342* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

INTERLEAVING DEVICE Patent

James R. Fischer, inventor (to NASA) Issued 15 May 1979 15 p Filed 2 Sep. 1977 Supersedes N77-31800 (15 - 22, p 2985) Continuation-in-part of abandoned US Patent Appl. SN-678813, filed 21 Apr. 1976

(NASA-Case-GSC-12111-2; US-Patent-4,154,501; US-Patent-Appl-SN-830272; US-Patent-Appl-SN-678813; US-Patent-Class-350-96.25; US-Patent-Class-365-120) Avail: US Patent and Trademark Office CSCL 09C

An interleaving device for processing energy signals between various logic devices has a first number of spaced energy carrying layer mateials. Each of the first layer materials has a number of juxtaposed conduits passing energy signals through which are passed. Each of the conduits has a longitudinal axis substantially parallel to a diagonal of each of the first layers. A second group of energy carrying materials is arranged between adjacent ones of the spaced first layer materials. Each of the second layer materials has a number of juxtaposed conduits through which the energy signals are also passed. Each of the conduits in the second layer has a longitudinal axis substantially parallel to a diagonal of each of the second layer materials and substantially perpendicular to the axes of the conduits of the first layer materials.

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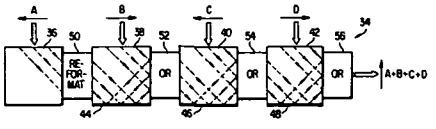


N81-29344*# National Aeronautics and Space Administration. Pasadena Office, Calif.

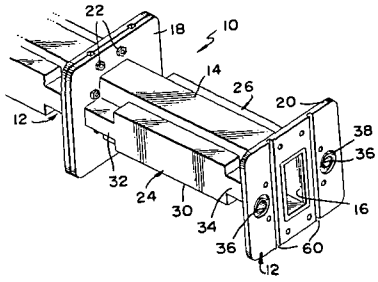
WAVEGUIDE COOLING SYSTEM Patent Application

Bill C. J. Chen (JPL, California Inst. of Tech., Pasadena) and Rob W. Hartop, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 30 Apr. 1981 11 p

(Contract NAS7-100)

(NASA-Case-NPO-15401-1; US-Patent-Appl-SN-259210) Avail: NTIS HC A02/MF A01 CSCL 09C

An improved system is described for cooling high power waveguides by the use of cooling ducts extending along the waveguide, which minimizes hot spots at the flanges where waveguide sections are connected together. The cooling duct extends along substantially the full length of the waveguide section, and each flange at the end of the section has a through hole with an inner end connected to the duct and an opposite end that can be aligned with a flange hole n another waveguide section. Each flange is formed with a drainage groove in its face, between the through hole and the waveguide conduit to prevent leakage of cooling fluid into the waveguide. The ducts have narrowed sections immediately adjacent to the flanges to provide room for the installation of fasteners closely around the waveguide channel. NASA



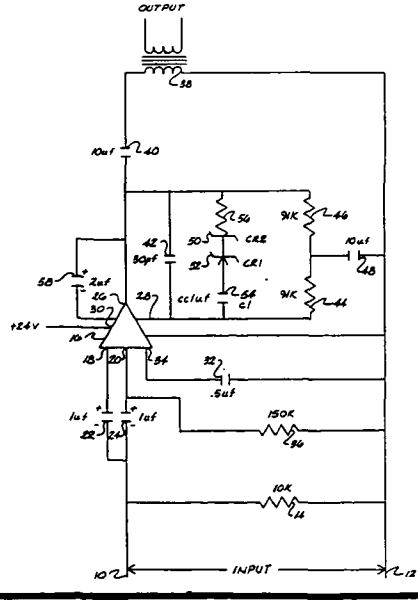
N81-29347*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

AUTOMATIC LEVEL CONTROL CIRCUIT Patent Application

Pierce C. Toole and Dennis M. McCarthy, inventors (to NASA) (Planning Research Corp., Kennedy Space Center, Fla.) Filed 17 Jul. 1981 14 p

(NASA-Case-KSC-11170-1; US-Patent-Appl-SN-284288) Avail: NTIS HC A02/MF A01 CSCL 09C

An automatic level control circuit for an operational amplifier is disclosed for minimizing spikes or instantaneous gain of the amplifier at a low period wherein no signal is received on the input. The apparatus includes a multi-branch circuit which is connected between an output terminal and a feedback terminal. A pair of zener diodes are connected back-to-back in series with a capacitor provided in one of the branches. A pair of voltage dividing resistors are connected in another of the branches and a second capacitor is provided in the remaining branch of controlling the high frequency oscillations of the operational amplifier. NASA

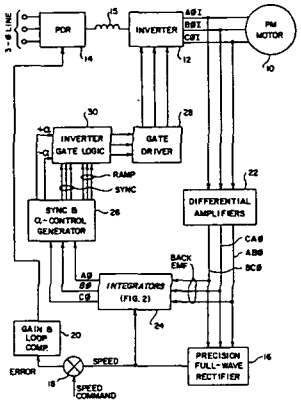


N81-31480*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

ADAPTIVE CONTROL SYSTEM FOR LINE-COMMUTATED INVERTERS Patent Application

Carlisle R. Dolland (AiResearch Mfg. Co., Torrance, Calif.) and David Bailey, inventors (to NASA) (AiResearch Mfg. Co., Torrance, Calif.) Filed 7 Aug. 1981 14 p Sponsored by NASA (NASA-Case-MFS-25209-1; US-Patent-Appl-SN-291132) Avail: NTIS HC A02/MF A01 CSCL 09C

A control system for a permanent-magnet motor driven by a multiphase line-commutated inverter is described. It is provided with integrators for integrating the back EMF of each phase of the motor for use in generating system control signals for an inverter gate logic using a sync and firing angle control generator connected to the outputs of the integrators. A precision full-wave rectifier provides a speed control feedback signal to a phase-delay rectifier via a gain and loop compensation circuit and to the integrators for adaptive control of the attenuation of low frequencies by the integrators as a function of motor speed. As the motor speed increases, the attenuation of low frequency components by the integrators is increased to offset the gain of the integrators to spurious low frequencies. While the attenuation may be a continuous linear function of speed, a switch is employed to provide a step change in attenuation at 40% of speed. NASA

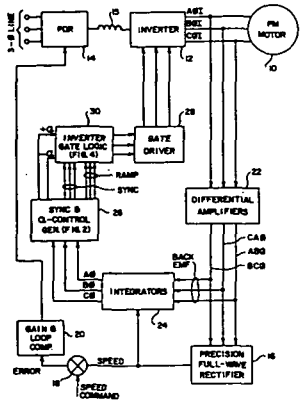


N81-31481*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

ADAPTIVE REFERENCE VOLTAGE GENERATOR FOR FIRING ANGLE CONTROL OF LINE-COMMUTATED INVERTERS Patent Application

Carlisle R. Dolland, inventor (to NASA) (Garrett Corp., Torrance, Calif.) Filed 7 Aug. 1981 18 p Sponsored by NASA (NASA-Case-MFS-25215-1; US-Patent-Appl-SN-291131) Avail: NTIS HC A02/MF A01 CSCL 09C

A control system for a permanent-magnet motor driven by a multiphase line-commutated inverter is described. It is provided with integrators for integrating the back EMF of each phase of the motor for use in generating system control signals for an inverter gate logic using a sync and firing angle control generator connected to the outputs of the integrators. The firing angle control signals are produced by the control generator by means for combining 120 deg segments of the integrated back EMF signals symmetrical about their maxima into composite positive and negative waveforms, and means for sampling the maxima of each waveform every 120 deg. These samples are then used as positive and negative firing angle control signals, whereby any change in amplitude of the integrated back EMF signals will not affect a change in the operating power factor of the motor and inverter. NASA

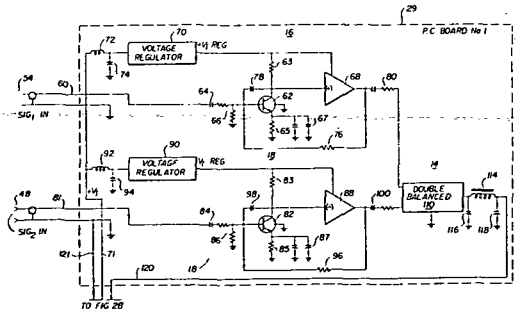


N81-31482*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

HIGH STABILITY BUFFERED PHASE COMPARATOR Patent Application

Victor S. Reinhardt and William A. Adams, inventors (to NASA) Filed 17 Jul. 1981 20 p (NASA-Case-GSC-12645-1; US-Patent-Appl-SN-284314) Avail: NTIS HC A02/MF A01 CSCL 09C

A low noise RF signal phase comparator comprised of two high stability driver buffer amplifiers driving a double balanced mixer which operate to generate a beat frequency between the two RF input signals coupled to the amplifiers from the RF sources is described. The beat frequency output from the mixer is applied to a low noise zero crossing detector which is the *phase difference between the two RF inputs. Temperature stability* is provided by mounting the amplifiers and mixer on a common circuit board with the active circuit elements located on one side of a circuit board and the passive circuit elements located on the opposite side. A common heat sink is located adjacent the circuit board. The active circuit elements are embedded into the bores of the heat sink which slows the effect of ambient *temperature changes and reduces the temperature gradients* between the active circuit elements, thus improving the cancellation of temperature effects. The two amplifiers include individual voltage regulators, which increases RF isolation. NASA



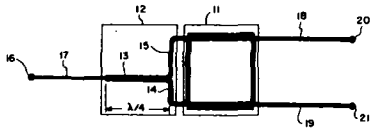
N81-31483*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

UNEQUAL SPLIT MICROWAVE POWER DIVIDER Patent Application

Marion Crawford Bailey, inventor (to NASA) Filed 30 Jul. 1981 11 p (NASA-Case-LAR-12889-1; US-Patent-Appl-SN-288434) Avail: NTIS HC A02/MF A01 CSCL 09C

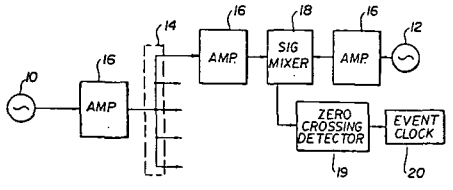
An unequal split in-phase microwave power divider is described. A power signal is applied to a power divider that produces two signals that are equal and out of phase. These

two signals are applied to a quadrature hybrid that produces two signals at the output terminals and that are unequal and in-phase.
NASA



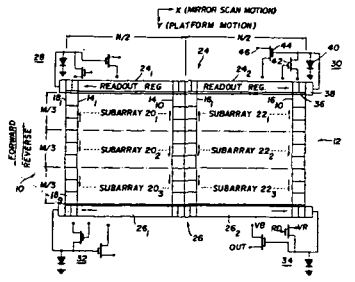
N81-32391*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
HIGH STABILITY AMPLIFIER Patent Application
Victor S. Reinhardt and William A. Adams, inventors (to NASA) Filed 17 Jul. 1981 14 p
(NASA-Case-GSC-12646-1; US-Patent-Appl-SN-284290) Avail: NTIS HC A02/MF A01 CSCL 09C

An electrical RF signal amplifier exhibiting high temperature stability and RF isolation is described. The signal amplifier is comprised of an integrated circuit voltage regulator, a single transistor, and an integrated circuit operational amplifier mounted on a circuit board with passive circuit elements located on one side of the circuit board and the active elements on the other. The casings of the active circuit elements are embedded in a common heat sink, effectively slowing the effect of ambient temperature on the active circuit elements. The driver transistor and operational amplifier are coupled together to form a feedback amplifier powered from the voltage regulator. The voltage regulator increases RF isolation by inhibiting any cross-talk from the power supply.
NASA



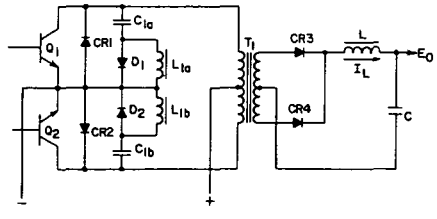
N81-33403* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TIME DELAY AND INTEGRATION DETECTORS USING CHARGE TRANSFER DEVICES Patent
David H. McCann, (Westinghouse Electric Corp., Baltimore), Marvin H. White, (Westinghouse Electric Corp., Baltimore), and Alfred P. Turly, (Westinghouse Electric Corp., Baltimore) Issued 21 Jul. 1981 7 p Filed 22 Sep. 1978 Supersedes N79-13262 (17 - 04, p 0446) Sponsored by NASA
(NASA-Case-GSC-12324-1; US-Patent-4,280,141; US-Patent-Appl-SN-945043; US-Patent-Class-358-213; US-Patent-Class-358-109) Avail: US Patent and Trademark Office CSCL 09C

An imaging system comprises a multi-channel matrix array of CCD devices wherein a number of sensor cells (pixels) in each channel are subdivided and operated in discrete intercoupled groups of subarrays with a readout CCD shift register terminating each end of the channels. Clock voltages, applied to the subarrays, selectively cause charge signal flow in each subarray in either direction independent of the other subarrays. By selective application of four phase clock voltages, either one, two or all three of the sections subarray sections cause charge signal flow in one direction, while the remainder cause charge signal flow in the opposite direction. This creates a form of selective electronic exposure control which provides an effective variable time delay and integration of three, six or nine sensor cells or integration stages. The device is constructed on a semiconductor sustrate with a buried channel and is adapted for front surface imaging through transparent doped tin oxide gates.
Official Gazette of the U.S. Patent and Trademark Office



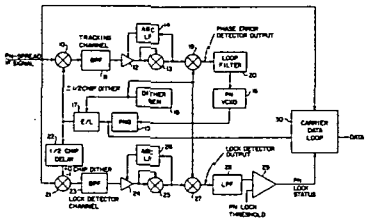
N81-33404* National Aeronautics and Space Administration. Pasadena Office, Calif.
PUSH-PULL CONVERTER WITH ENERGY SAVING CIRCUIT FOR PROTECTING SWITCHING TRANSISTORS FROM PEAK POWER STRESS Patent
W. T. McLyman, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 30 Jun. 1981 7 p Filed 22 Jun. 1979 Supersedes N79-26312 (17 - 17, p 2256) Sponsored by NASA
(NASA-Case-NPO-14316-1; US-Patent-4,276,588; US-Patent-Appl-SN-051276; US-Patent-Class-363-56; US-Patent-Class-363-24) Avail: US Patent and Trademark Office CSCL 09C

In a push-pull converter, switching transistors are protected from peak power stresses by a separate snubber circuit in parallel with each comprising a capacitor and an inductor in series, and a diode in parallel with the inductor. The diode is connected to conduct current of the same polarity as the base-emitter juction of the transistor so that energy stored in the capacitor while the transistor is switched off, to protect it against peak power stress, discharges through the inductor when the transistor is turned on, and after the capacitor is discharges through the diode. To return this energy to the power supply, or to utilize this energy in some external circuit, the inductor may be replaced by a transformer having its secondary winding connected to the power supply or to the external circuit.
Official Gazette of the U.S. Patent and Trademark Office



N81-33405* National Aeronautics and Space Administration. Pasadena Office, Calif.
PN LOCK INDICATOR FOR DITHERED PN CODE TRACKING LOOP Patent
Lansing M. Carson, inventor (to NASA) (Motorola, Inc., Phoenix, Ariz.) Issued 14 Jul. 1981 6 p Filed 6 Mar. 1979 Supersedes N79-18224 (17 - 09, p 1128) Sponsored by NASA
(NASA-Case-NPO-14435-1; US-Patent-4,279-018; US-Patent-Appl-SN-017886; US-Patent-Class-364-514; US-Patent-class-331-DIG.2; US-Patent-Class-329-122; US-Patent-Class-375-1) Avail: US Patent and Trademark Office CSCL 09C

In a delay-lock one-delta (+or - 1/2 chip) dithered PN code tracking loop, an indication of lock in the PN code tracking loop is provided by delaying the dithered local PN code by a half chip to produce a +0, -1 dithered PN code that is then multiplied with the received PN-spread IF signal to produce a signal proportional to the correlation of this dithered code offset from the received code. The correlation signal is bandpass filtered, amplified with AGC control, and square-law detected to obtain a dc signal proportional to the degree of correlation. The dc signal is multiplied by the dithering control signal to effectivity substract noise voltage from the lock correlation signal which is then compared with a PN lock status signal.
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.

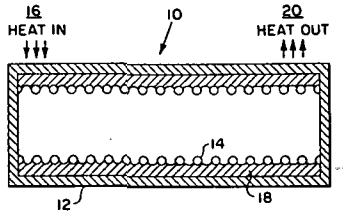
For related information see also *02 Aerodynamics* and *77 Thermodynamics and Statistical Physics.*

N81-22310*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

HEAT PIPES CONTAINING ALKALI METAL WORKING FLUID Patent Application

James F. Morris, inventor (to NASA) Filed 16 Mar. 1981 8 p (NASA-Case-LEW-12253-1; US-Patent-Appl-SN-243682) Avail: NTIS HC A02/MF A01 CSCL 20D

The improvement of high temperature evaporation condensation heat transfer devices which have important and unique advantages in terrestrial and spade energy processing is discussed. The device is in the form of a heat pipe comprising a sealed container or envelope which contains a capillary wick. The temperature of one end of the heat pipe is raised by the input of extremely hot and corrosive heat from an external heat source. A working fluid of a corrosive alkali metal, transfers this heat to a heat receiver remote from the heat source. The container and wick are fabricated from a superalloy containing a small percentage of corrosion inhibiting or gettering element. Lanthanum, scandium, yttrium, thorium, and hafnium are utilized as the alloying metal. NASA



N81-24384*# National Aeronautics and Space Administration. Pasadena Office, Calif.

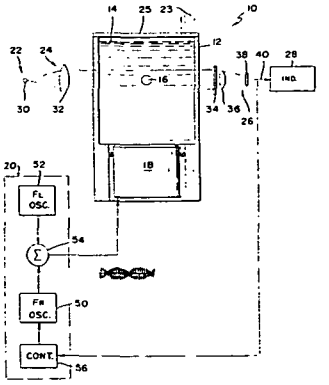
SYSTEM FOR MONITORING PHYSICAL CHARACTERISTICS OF FLUIDS Patent Application

Eugene Trinh (JPL) and Taylor G. Wang, inventors (to NASA) (JPL) Filed 23 Mar. 1981 16 p

(Contract NAS7-100)

(NASA-Case-NPO-15400-1; US-Patent-Appl-SN-246774) Avail: NTIS HC A02/MF A01 CSCL 20D

An apparatus and method are described for measuring physical characteristics of a fluid, by placing a drop of the fluid in a bath of a second fluid and passing acoustic waves through the bath. The applied frequency of the acoustic waves is varied, to determine the precise value of a frequency at which the drop undergoes resonant oscillations. The resonant frequency indicates the interfacial tension of the drop in the bath, and the interfacial tension can indicate physical properties of the fluid in the drop. NASA



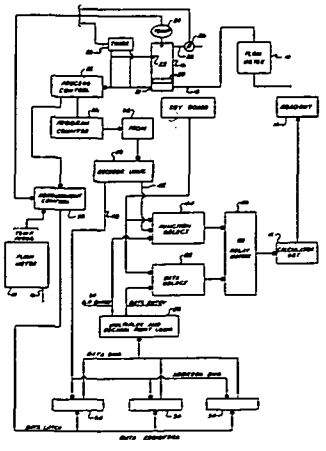
N81-26402* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

AUTOMATIC FLOWMETER CALIBRATION SYSTEM Patent

Raymond V. Lisle and Terry L. Wilson, inventor (to NASA) 24 Feb. 1981 5 p Filed 22 Jun. 1979 Supersedes N79-27479 (17 - 18, p 2409)

(NASA-Case-KSC-11076-1; US-Patent-4,253,156; US-Patent-Appl-SN-051274; US-Patent-Class-364-571; US-Patent-Class-364-510; US-Patent-Class-73-861) Avail: US Patent and Trademark Office CSCL 20D

A system for automatically calibrating the accuracy of a flowmeter is described. The system includes a calculator capable of performing mathematical functions responsive to receiving data signals and function command signals. A prover cylinder is provided for measuring the temperature, pressure, and time required for accumulating a predetermined volume of fluid. Along with these signals, signals representing the temperature and pressure of the fluid going into the meter are fed to a plurality of data registers. Under control of a progress controller, the data registers are read out and the information is fed through a data select circuit to the calculator. Command signals are also produced by a function select circuit and are fed to the calculator set indicating the desired function to be performed. The reading is then compared with the reading produced by the flowmeter. Official Gazette of the U.S. Patent and Trademark Office



35 INSTRUMENTATION AND PHOTOGRAPHY

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

For aerial photography see *43 Earth Resources*. For related information see also *06 Aircraft Instrumentation*, and *19 Spacecraft Instrumentation*.

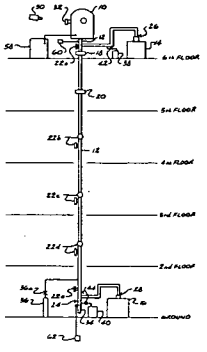
N81-24413*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

METHOD AND APPARATUS FOR SUPERCOOLING AND SOLIDIFYING SUBSTANCES Patent Application

Lewis L. Lacy, Michael B. Robinson, Thomas J. Rathz, Lester Katz, and Daniel B. Nisen, inventors (to NASA) Filed 23 Mar. 1981 20 p

(NASA-Case-MFS-25242-1; US-Patent-Appl-SN-246773) Avail: NTIS HC A02/MF A01 CSCL 14B

The containerless melting, supercooling, and solidification of substances is facilitated by using an enclosure in which the specimen is positioned, maintained at ground potential, and suspended by a support wire made of the major constituent of the sample. A melting apparatus in the enclosure has a hot circular cathode for supplying bombarding electrons and a focusing grid for concentrating the electrons on the sample surface. An elongated drop tube aligned with the specimen is disposed under the enclosure, and vacuum sources are provided for evacuating the enclosure and drop tube. A detachable specimen catcher adjacent to the bottom of the drop tube recovers the specimen. The method involves heating the specimen, dropping the specimen melt through the tube where it cools by radiation, and recovering the resolidified specimen. The tube may be filled with an inert gas so that the specimen cools by convection as well as radiation. During free fall of the molten material, the sample is in a containerless, low gravity environment which enhances supercooling. Nucleation in the falling specimen is sensed by silicon photovoltaic detectors, and the amount of supercooling is determined from nucleation time and cooling rate. NASA



N81-24414*# National Aeronautics and Space Administration. Pasadena Office, Calif.

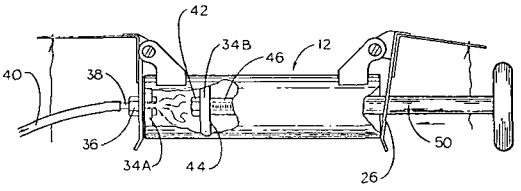
MOBILE SAMPLER FOR USE IN ACQUIRING SAMPLES OF TERRESTRIAL ATMOSPHERIC GASSES Patent Application

Curtis E. Tucker, Jr. (JPL) and Harold P. Holway, inventor (to NASA) (JPL) Filed 23 Mar. 1981 15 p

(Contract NAS7-100)

(NASA-Case-NPO-15220-1; US-Patent-Appl-SN-246777) Avail: NTIS HC A02/MF A01 CSCL 14B

Samples of terrestial atmospheric gasses may be acquired from a free body of such gasses using a device which is characterized by a number of tubular bodies adapted to be mounted in side-by-side relation on a motorized highway vehicle in mutual parallelism with the axis of the normal path of travel for the vehicles. Each of the bodies is of a cylindrical configuration and has an axial opening at each of its opposite ends through which a linear flow path is defined. A pair of pivotally supported, spring-biased sealing caps is mounted adjacent to the ends of the body and continuously urged into a hermetic sealing relationship. A restraint for securing the caps against spring-urged pivotal displacement, includes a separable, normally tensioned line interconnecting the caps and an operable release mechanism for simultaneously releasing the caps for spring-urged displacement. A hot wire cutter is included for separating the line, whereby samples of air are trapped in the body as the caps are spring-driven to assume a hermetically sealed relation with the openings defined in each of the opposite ends of the body. NASA



N81-26431* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

THERMOCOUPLE, MULTIPLE JUNCTION REFERENCE OVEN

Louis P. LeBlanc, inventor (to NASA) 28 Apr. 1981 5 p Filed 20 Feb. 1980 Supersedes N80-19469 (18 - 10, p 1293)

(NASA-Case-FRC-10112-1; US-Patent-4,264,802; US-Patent-Appl-SN-122965; US-Patent-Class-219-210; US-Patent-Class-73-361; US-Patent-Class-219-209; US-Patent-Class-219-510; US-Patent-Class-361-334; US-Patent-Class-236-1F) Avail: US Patent and Trademark Office CSCL 14B

An improved oven for maintaining the junctions of a plurality of reference thermocouples at a common and constant temperature is described. The oven is characterized by a cylindrical body defining a heat sink with axially extended-cylindrical cavity a singularized heating element which comprises a unitary cylindrical heating element consisting of a resistance heating coil wound about the surface of metallic spool with an axial bore defined and seated in the cavity. Other features of the oven include an annular array of radially extended bores defined in the cylindrical body and a plurality of reference thermocouple junctions seated in the bores in uniformly spaced relation with the heating element, and a temperature sensing device seated in the axial bore for detecting temperature changes as they occur in the spool and circuit to apply a voltage across the coil in response to detected drops in temperatures of the spool.

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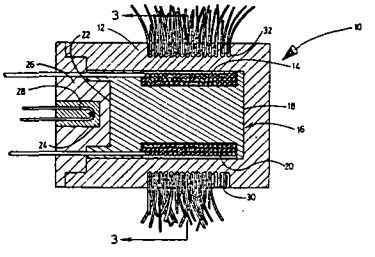


N81-27459*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

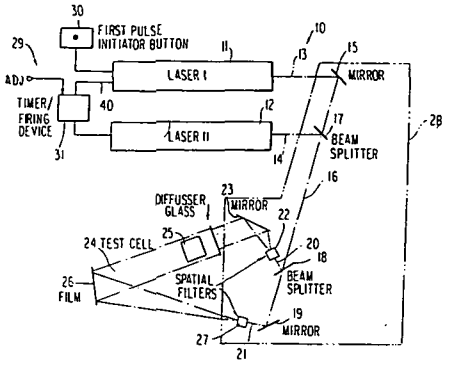
METHOD OF AND APPARATUS FOR DOUBLE-EXPOSURE HOLOGRAPHIC INTERFEROMETRY Patent Application

William K. Witherow, inventor (to NASA) Filed 17 Jun. 1981 14 p

(NASA-Case-MFS-25405-1; US-Patent-Appl-SN-274708) Avail: NTIS HC A02/MF A01 CSCL 14E

Double exposure holographic interferometry is carried out using two lasers which are responsive to respective applied firing signals for producing respective pulsed output beams. An optical system is provided which is so oriented 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 at a predetermined period of time later. NASA



N81-29407* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AUTOMATED SYRINGE SAMPLER Patent

Gerald C. Purgold, inventor (to NASA) Issued 23 Jun. 1981 8 p Filed 11 Jan. 1980 Supersedes N80-19664 (18 - 10, p 1318)

(NASA-Case-LAR-12308-1; US-Patent-4,274,285; US-Patent-Appl-SN-111438; US-Patent-Class-73-683.31; US-Patent-Class-73-684.52) Avail: US Patent and Trademark Office CSCL 14B

A number of sampling services are disposed in a rack which slides into a housing. In response to a signal from an antenna, the circutry elements are activated which provide power individually, collectively, or selectively to a servomechanism thereby moving an actuator arm and the attached jawed bracket supporting an evaculated tube towards a stationary needle. One open end of the needle extends through the side wall of a conduit to the interior and the other open end is maintained within the protective sleeve, supported by a bifurcated bracket. A septum in punctured by the end of the needle within the sleeve and a sample of the fluid medium in the conduit flows through the needle and is transferred to a tube. The signal to the servo is then reversed and the actuator arm moves the tube back to its original position permitting the septum to expand and seal the hole made by the needle. The jawed bracket is attached by pivot to the actuator to facilitate tube replacement.

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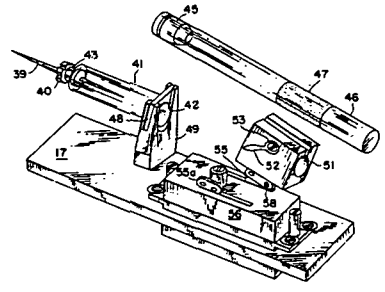


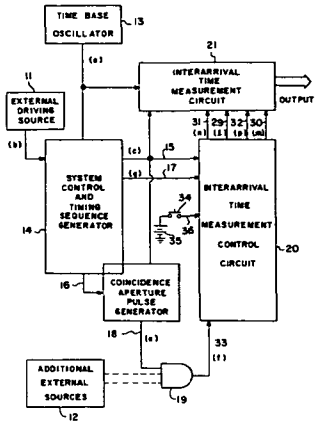
N81-31529*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AN INSTRUMENT FOR DETERMINING COINCIDENCE AND ELAPSE TIME BETWEEN INDEPENDENT SOURCES OF RANDOM SEQUENTIAL EVENTS Patent Application

James I. Clemmons, Jr., inventor (to NASA) Filed 10 Jul. 1981 16 p

(NASA-Case-LAR-12531-1; US-Patent-Appl-SN-282191) Avail: NTIS HC A02/MF A01 CSCL 14B

An instrument for use in laser velocimetry is described. The instrument receives pulses from a primary external source and one or more secondary external sources and determines when there is coincidence between the primary and one of the secondary sources. The instrument generates a finite time window (coincidence aperture) during which coincidence is defined to have occurred. The time intervals between coincidence apertures in which coincidences occur are measured. NASA



N81-33448* National Aeronautics and Space Administration. Pasadena Office, Calif.

OPTICAL GYROSCOPE SYSTEM Patent

Willis C. Goss (JPL, California Inst. of Tech., Pasadena) and Raymond Goldstein, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 28 Jul. 1981 13 p Continuation-in-part of US Patent Appl. SN-853349, filed 21 Nov. 1977 Sponsored by NASA

(NASA-Case-NPO-14258-1; US-Patent-4,280,766; US-Patent-Appl-SN-972252; US-Patent-Appl-SN-853349; US-Patent-Class-356-350; US-Patent-Class-350-370; US-Patent-Class-356-351) Avail: US Patent and Trademark Office CSCL 14B

Light beams pass in opposite directions through a single mode fiber optic wave guide that extends in a circle or coil in an optical gyroscope system which measures the rotation rate of the coil by measuring the relative phase shifts of the beams by interferometric techniques. Beam splitting and phase shifting of the light are facilitated by utilizing brief pulses of light and by using light-controlling devices which are operated for a brief time only when the light pulse passes in one direction through the device but not at a different time when the pulse is passing in the opposite direction through the device. High accuracy in rotation measurement is achieved at both very slow and very fast rotation rates, by alternately operating the system so that at zero rotation the interfering waves are alternately 90 out of phase and in phase. Linear polarization of the light beams is maintained by coiling the full length of the optic fiber in a single plane.

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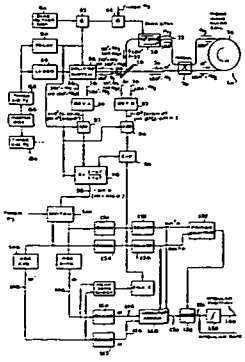
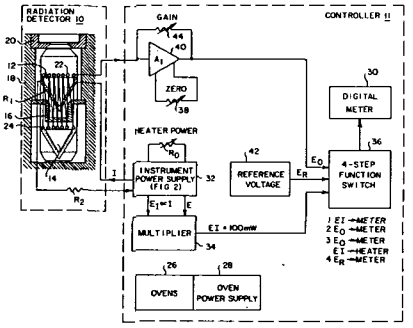


35 INSTRUMENTATION AND PHOTOGRAPHY

N81-33449*# National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD AND APPARATUS FOR PRECISION CONTROL OF RADIOMETER Patent Application csc 14b
Roger S. Estey, inventor (to NASA) (JPL) Filed 30 Apr. 1981 14 p
(Contract NAS7-100)
(NASA-Case-NPO-15398-1; US-Patent-Appl-SN-259212) Avail: NTIS HC A02/MF A01

A radiometer controller of a solar radiation detector is described. The system includes 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 to the receptor cavity in the radiometer detector to a predetermined full scale level as displayed by a meter. Then with the heater de-energized and the receptor cavity covered, the voltage output, is set to zero as displayed by the meter. Next the preset power is applied to the heater and the output of the radiant measurement channel is applied to the panel meter. With this preset heater power producing the proper heat, the gain of the measurement channel is adjusted to bring the meter display to full scale. NASA

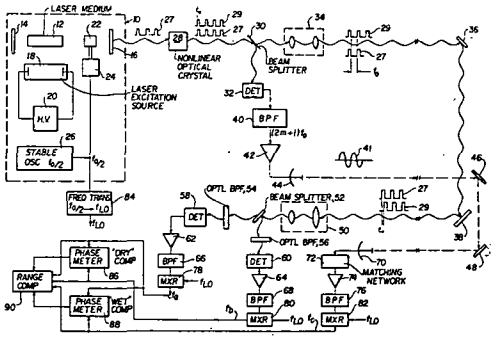


36 LASERS AND MASERS

Includes parametric amplifiers.

N81-22344*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GEODETIC DISTANCE MEASURING APPARATUS Patent Application
James B. Abshire, inventor (to NASA) Filed 19 Dec. 1980 17 p
(NASA-Case-GSC-12609-1; US-Patent-Appl-SN-218586) Avail: NTIS HC A02/MF A01 CSCL 20E

A geodetic distance measuring apparatus which compensates for the refractive index of the atmosphere is discussed. A mode locked laser system with a laser device and its peripheral components is utilized to derive two mutually phase locked optical wavelength signals and one phase locked microwave CW signal which respectively traverse the same distance measurement path. The optical signals are comprised of pulse type signals. Phase comparison of the two optical wavelength pulse signals is used to provide the dry air density while phase comparison of one of the optical wavelength pulse signals and the microwave CW signal issued to provide wet or water vapor density of the air. The distance to be measured corrected for the atmospheric dry air and water vapor densities in the measurement path is computed from these measurements. A time interval unit is included for measuring transit time of individual optical pulses for resolving the phase ambiguity needed with the phase measurements to give the true target distance. NASA



N81-24422* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DIRECTION SENSITIVE LASER VELOCIMETER
John M. Franke, inventor (to NASA) 10 Mar. 1981 5 p Filed 6 Apr. 1979 Supersedes N79-28532 (17 - 19. p 2550)
(NASA-Case-LAR-12177-1; US-Patent-4,255,048; US-Patent-Appl-SN-027558; US-Patent-Class-356-28.5; US-Patent-Class-356-356; US-Patent-Class-356-358;) Avail: US Patent and Trademark Office CSCL 20E

A laser velocimeter is described which determines the direction of movement of particles. A laser produces a transmitted beam that illuminates the volume under investigation. The backscattered light is divided into two equal intensity beams. A first part of a sample of the transmitted beam is mixed with one of the two equal intensity beams and applied to a first photodetector. A second part of the sample is phase shifted by 90 deg, mixed with the other of the two equal intensity beams and applied to a second photodetector. The output of the first photodetector is phase shifted by 90 deg and then multiplied with the output of the second photodetector to produce a signal indicative of direction of movement.

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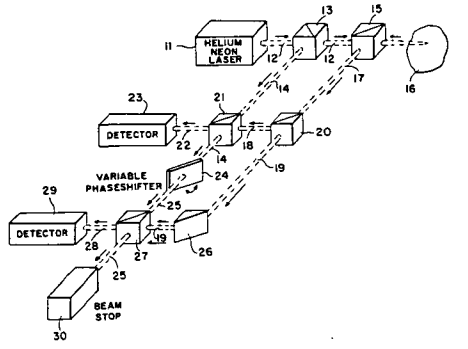
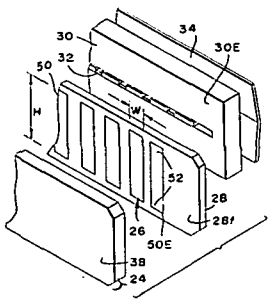


N81-24425*# National Aeronautics and Space Administration. Pasadena Office, Calif.
MASER AMPLIFIER SLOW WAVE STRUCTURE Patent Application
Robert C. Clauss (JPL), Rex B. Quinn (JPL), Samuel M. Petty (JPL), and David L. Trowbridge, inventors (to NASA) (JPL) Filed 23 Mar. 1981 14 p
(Contract NAS7-100)
(NASA-Case-NPO-15211-1; US-Patent-Appl-SN-246779) Avail: NTIS HC A02/MF A01 CSCL 20E

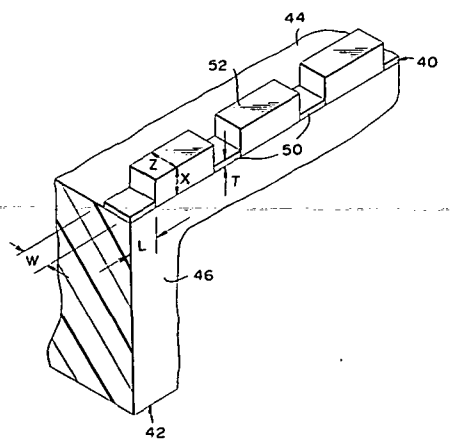
A maser amplifier is described which includes a slow wave structure having multiple comb elements lying against a strip of maser material, which is constructed to avoid problems arising from differential expansion of the materials of the maser strip and comb during temperature cycling, and that enables formation and mounting of the comb elements by the relatively precise and low cost printed circuit techniques. Each comb has a height of about one half wavelength of the microwaves to be amplified.

and the comb elements are devoid of direct electrical connections to one another or to the waveguide walls. The comb elements can be formed by vapor deposition, plating, or etching of an adhesively mounted foil, on a dielectric backing strip. NASA



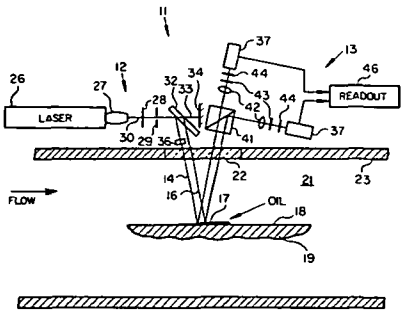
N81-24426*# National Aeronautics and Space Administration. Pasadena Office, Calif.
RESONANT ISOLATOR FOR MASER AMPLIFIER
Robert C. Clauss, inventor (to NASA) (JPL) 23 Mar. 1981 15 p
(Contract NAS7-100)
(NASA-Case-NPO-15201-1; US-Patent-Appl-SN-246778) Avail: NTIS HC A02/MF A01 CSCL 20E

An isolator is described for use in a low-noise maser amplifier, which provides low loss across a wide bandwidth and which can be constructed at moderate cost. The isolator includes a train of garnet or ferrite element extending along the length of a microwave channel parallel to the slow-wave structure with the elements being of staggered height, so that the thin elements which are resonant to the microwaves are separated by much thicker elements. The thick garnet or ferrite elements reduce the magnetic flux passing through the thin elements to permit altering of the shape of the thin elements so as to facilitate their fabrication and to provide better isolation with reduced loss, by increasing the thickness of the thin elements and decreasing their length and width. NASA



N81-29415*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
DUAL-BEAM SKIN FRICTION INTERFEROMETER Patent Application
Daryl J. Monson, inventor (to NASA) Filed 10 Jul. 1981 21 p
(NASA-Case-ARC-11354-1; US-Patent-Appl-SN-282192) Avail: NTIS HC A02/MF A01 CSCL 20E

A portable dual-laser-beam interferometer is described that nonintrusively measures skin friction by monitoring the thickness change of an oil film at two locations while said oil film is subjected to shear stress. An interferometer flat is utilized to develop the two beams. Light detectors sense the beam reflections from the oil film and the surface thereunder. The signals from the detectors are recorded so that the number of interference fringes produced over a given time span may be counted. NASA

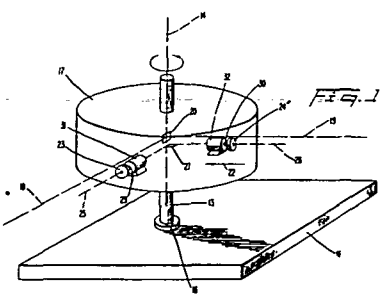


37 MECHANICAL ENGINEERING

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

N81-22358*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
APPARATUS FOR AND METHOD OF COMPENSATING DYNAMIC UNBALANCE Patent Application
John A. Hrastar, Sr., inventor (to NASA) Filed 27 Feb. 1981 29 p
(NASA-Case-GSC-12550-1; US-Patent-Appl-SN-238888) Avail: NTIS HC A03/MF A01 CSCL 13I

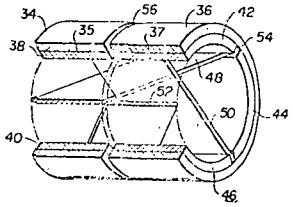
An apparatus to stabilize a fine platform that carries a parabolic reflecting dish, utilized in connection with the large aperture, multichannel microwave radiometer, is discussed. It provides compensation for dynamic unbalance imparted to a fixed body by a shaft about which the rotating body rotates. 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. NASA



N81-22359*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
UNIDIRECTIONAL FLEXURAL PIVOT Patent Application
Hossein Bahiman, inventor (to NASA) Filed 16 Mar. 1981 10 p
(NASA-Case-GSC-12622-1; US-Patent-Appl-SN-243684) Avail: NTIS HC A02/MF A01 CSCL 13I

A flexural pivot type bearing is described. A pair of generally coaxial mutually rotatable cylindrical outer ring members are held in spaced apart relationship by three parallelogram shaped relatively thin, flexible, flat planar spring elements which are substantially inextensible in length and are joined to the inside of the outer ring members and held in position by accurate inner ring segments, three for each outer ring member, which respectively span an arc of substantially 120 deg. The parallelo-

gram shape of the spring elements provides a slanted interconnection between the outer ring members. The direction of slant determines in which direction the spring elements can flex or bend unidirectionally to relieve the compression stress imparted thereto by any angular rotation of the outer ring members. Novelty is believed to reside in one or more parallelogram shaped spring elements which are joined to a pair of mutually rotatable generally cylindrical pivot members at nondiametrically opposing attachment points. J.D.H.

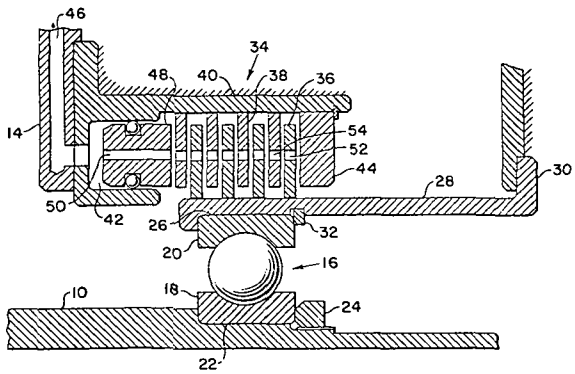


N81-22360*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

MULTIPLE PLATE HYDROSTATIC VISCOUS DAMPER Patent Application

L. P. Ludwig, inventor (to NASA) Filed 27 Feb. 1981 7 p (NASA-Case-LEW-12445-1; US-Patent-Appl-SN-238887) Avail: NTIS HC A02/MF A01 CSCL 13I

A device for damping radial motion of a rotating shaft is described. The damper comprises a series of spaced plates extending in a radial direction. A hydraulic piston is utilized to place a load in these plates. Each annular plate is provided with a suitable hydrostatic bearing geometry on at least one of its faces. This structure provides a high degree of dampening in a rotor case system of turbomachinery in general. The damper is particularly useful in gas turbine engines. NASA



N81-24442* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SELF-STABILIZING RADIAL FACE SEAL Patent

Izhak Etsion, inventor (to NASA) (Technion Research and Development Foundation Ltd., Haifa, Israel) Issued 7 Jan. 1981 6 p Filed 17 Nov. 1978 Supersedes N79-12445 (17 - 03, p 0333) Sponsored by NASA (NASA-Case-LEW-12991-1; US-Patent-4,260,166; US-Patent-Appl-SN-961-832; US-Patent-Class-277-96;) Avail: US Patent and Trademark Office CSCL 11A

A self-stabilizing radial face seal comprises an axial member and a primary seal ring juxtapositioned to a seal seat. At least one primary seal ring and seal seat unit is affixed to the axial member so as to rotate with it. The primary seal ring has a front face which opposes a face of the seal seat. The seal has both high-pressure and low-pressure regions of fluid, and seal seat is provided with a porous ring-like circumferential structure in the face of the seal seat opposite the front face of the primary seal ring.

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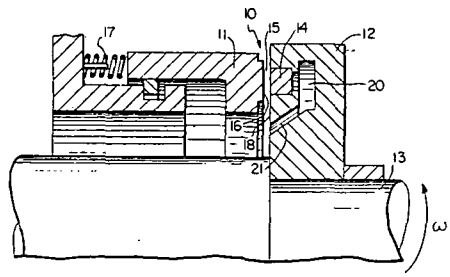

N81-24443* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

TIRE/WHEEL CONCEPT Patent

Philip M. Harper, Sr., inventor (to NASA) (Boeing Commercial Airplane Co., Seattle) Issued 19 May 1981 6 p Filed 12 Dec. 1979 Continuation of abandoned US Patent Appl. SN-893865, filed 16 Apr. 1978 Sponsored by NASA (NASA-Case-LAR-11695-2; US-Patent-4,267,992; US-Patent-Appl-SN-103836; US-Patent-Class-244-103R; US-Patent-Class-152-330RF; US-Patent-Class-152-353R; US-Patent-Class-152-353G; US-Patent-Class-152-379.4; US-Patent-Class-244-130; US-Patent-Appl-SN-893865) Avail: US Patent and Trademark Office CSCL 13F

A tire and wheel assembly is disclosed in which a low profile pneumatic tire (having sidewalls which deflect inwardly under load) and a wheel (having a rim featuring a narrow central channel and extended rim flanges) form the combination. The extended rim flanges support the tire sidewalls under static and dynamic loading conditions to produce a combination particularly suited to aircraft applications.

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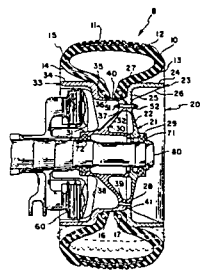
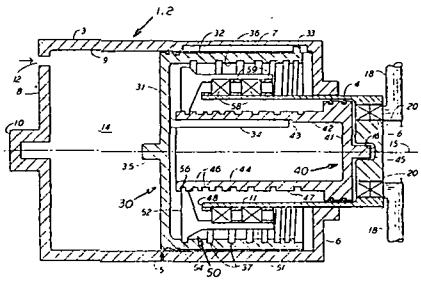


N81-24445*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

A GAS-TO-HYDRAULIC POWER CONVERTER Patent Application

Charles Wesley Galloway, inventor (to NASA) Filed 27 Feb. 1981 13 p (NASA-Case-MSC-18794-1; US-Patent-Appl-SN-238785) Avail: NTIS HC A02/MF A01 CSCL 13I

A gas piston driven hydraulic piston pump with a high efficiency gas cycle which injects the gas in slugs at the beginning of each power stroke is discussed. The hydraulic piston is disposed to operate inside the gas piston, and the two pistons which are both slidably but nonrotably mounted, are coupled together with a rotating but nonsliding motion transfer ring extending into antifriction grooves in the sidewalls of the two pistons. To make the hydraulic piston move at a constant speed during constant hydraulic horsepower demand, grooves are machined with variable and opposite pitches. The motion transfer ring is denominated a force multiplier ring. It is concluded that any number of piston assembly sets may be used to obtain desired hydraulic horsepower. NASA



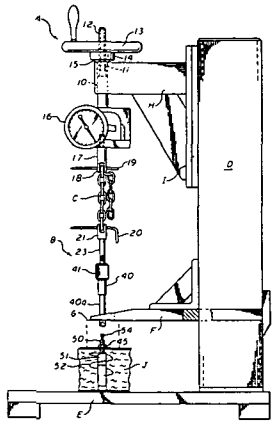
N81-24446*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

APPARATUS FOR ACCURATELY PRELOADING AUGER ATTACHMENT MEANS FOR FRANGIBLE PROTECTIVE MATERIAL Patent Application

Kenneth E. Wood, inventor (to NASA) (Rockwell International Corp., Downey, Calif.) Filed 30 Mar. 1981 12 p Sponsored by NASA

(NASA-Case-MSC-18791-1; US-Patent-Appl-SN-248746) Avail: NTIS HC A02/MF A01 CSCL 13I

Improvements to accurately adjust and secure the preload on the spring means, which were used on the Space Shuttle Orbiter, are discussed. Two forms of the tool are described; a multipart tool and a mounting jig. A known preload is applied to the spring means utilized for resiliently attaching frangible protective tile to the surface of structures which are exposed to extremely high temperatures. The tool is adaptable for applying preloads to devices installed in blind holes. NASA

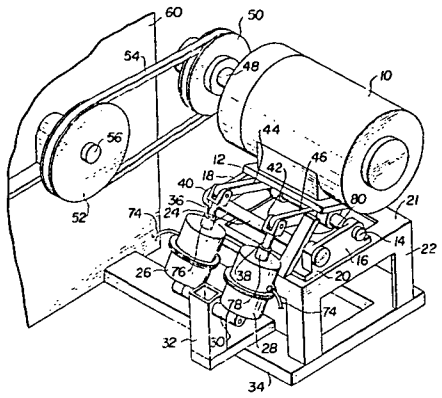


N81-24447*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

VARIABLE SPEED DRIVE Patent Application

Henry D. Obler, inventor (to NASA) Filed 27 Feb. 1981 12 p (NASA-Case-GSC-12643-1; US-Patent-Appl-SN-238786) Avail: NTIS HC A02/MF A01 CSCL 13I

A variable speed drive is described wherein a first embodiment is comprised of a pivotally mounted prime mover coupled to a rotary fluid output device, such as a fan or pump, through a variable and fixed pulley drive arrangement. The pivotal position of the prime mover and accordingly the pitch diameter of variable pulley means is controlled in accordance with fluid motor means coupled to the prime mover. This is actuated in response to a fluid feedback control signal derived from a sensed output of the rotary fluid output device. The pivotal motion of the prime mover imparts an accurate motion to the variable pulley means which effects a speed variation of the rotary fluid output device in accordance with the variation of the pitch diameter ratio of opposing variable and fixed pulley means. In a second embodiment, idler pulley means are pivotally mounted between the prime mover and the rotary fluid output device. NASA



N81-25370* National Aeronautics and Space Administration. Pasadena Office, Calif.

HOT GAS ENGINE WITH DUAL CRANKSHAFTS Patent

Allan R. McDougal, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 17 Mar. 1981 13 p Filed 19 May 1978 Supersedes N78-25431 (16 - 16, p 2123) Sponsored by NASA

(NASA-Case-NPO-14221-1; US-Patent-4,255,929; US-Patent-Appl-SN-907431; US-Patent-Class-60-517; US-Patent-Class-60-525) Avail: US Patent and Trademark Office CSCL 13I

A hot gas engine, such as a Stirling engine is described which comprises a displacer portion and an expander portion with a heat exchanger connected between them. The expander portion has a piston which is operatively connected to and rotates an expander crankshaft. In like manner, the displacer portion is provided with a piston which is also operatively connected to and rotates with a separate displacer crankshafts. The two crankshafts are synchronized with respect to each other preferably by means of an idler gear. Banks of displacer pistons can also be provided for operation on a common displacer crankshaft and banks of cooperating expander pistons also can be provided for operation on a common expander crankshaft.

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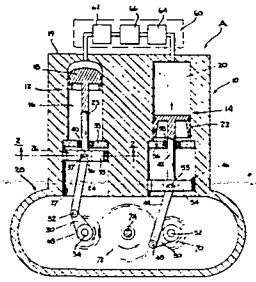

N81-25371* National Aeronautics and Space Administration. Pasadena Office, Calif.

SANDBLASTING NOZZLE Patent

Gerald S. Perkins (JPL, California Inst. of Technology, Pasadena), Eugene V. Pawlik (JPL, California Inst. of Technology, Pasadena), and Wayne M. Phillips, inventors (to NASA) (California Inst. of Technology, Pasadena) Issued 24 Feb. 1981 12 p Filed 17 Feb. 1976 Supersedes N77-17466 (15 - 08, p 1040) Sponsored by NASA

(NASA-Case-NPO-13823-1; US-Patent-4,252,768; US-Patent-Appl-SN-658487; US-Patent-Class-264-332; US-Patent-Class-106-43) Avail: US Patent and Trademark Office CSCL 13I

A nozzle for use with abrasive and/or corrosive materials is formed of sintered ceramic compositions having high temperature oxidation resistance, high hardness and high abrasion and corrosion resistance. The ceramic may be a binary solid solution of a ceramic oxide and silicon nitride, and preferably a ternary

solid solution of a ceramic oxide, silicon nitride and aluminum nitride. The ceramic oxide is selected from a group consisting of Al2O3, Y2O3 and Cr2O3, or mixtures of those compounds. Titanium carbide particles are dispersed in the ceramic mixture before sintering. The nozzles are encased for protection from external forces while in use by a metal or plastic casing.

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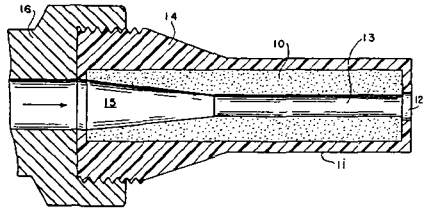

N81-26447* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

CIRCUMFERENTIAL SHAFT SEAL Patent

Lawrence P. Ludwig, inventor (to NASA) Issued 12 May 1981 4 p Filed 7 Dec. 1979 Supersedes N80-18401 (18 - 09, p 1145) Division of US Patent Appl. SN-672219, filed 21 Mar. 1976, US-Patent-4,212,477

(NASA-Case-LEW-12119-2; US-Patent-4,266,788; US-Patent-Appl-SN-102004; US-Patent-Class-277-193; US-Patent-Class-277-153; US-Patent-4,212,477; US-Patent-Appl-SN-672219) Avail: US Patent and Trademark Office CSCL 11A

A circumferential shaft seal comprising two sealing rings held to a rotating shaft by means of a surrounding elastomeric band is disclosed. The rings are segmented and are of a rigid sealing material such as carbon or a polyimide and graphite fiber composite.

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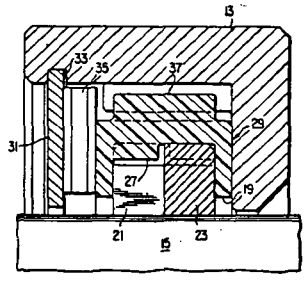

N81-27519* National Aeronautics and Space Administration. Pasadena Office, Calif.

TERMINAL GUIDANCE SENSOR SYSTEM

Antal K. Bejczy, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) 7 Apr. 1981 9 p Filed 23 Mar. 1979 Sponsored by NASA

(NASA-Case-NPO-14521-1; US-Patent-4,260,187; US-Patent-Appl-SN-023439; US-Patent-Class-294-86R; US-Patent-Class-244-161; US-Patent-Class-318-640; US-Patent-Class-356-152; US-Patent-Class-414-730) Avail: US Patent and Trademark Office CSCL 13I

A system is described for guiding a claw to the proper distance and into the proper orientation in yaw and pitch, to engage a grappling fixture. The system includes four proximity sensors on the claw, that are arranged at corners of an imaginary square, which sense the distance to the top surface of the grappling fixture. If a pair of sensors at opposite corners of the square sense a different distance to the top surface of the grappling fixture, then it is known that the claw is rotated about a corresponding axis with respect to the plane of the grappling fixture.

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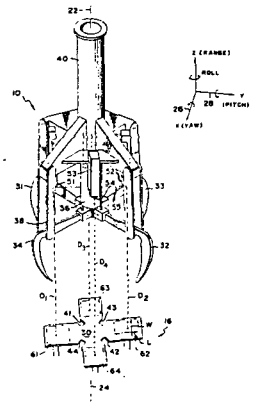


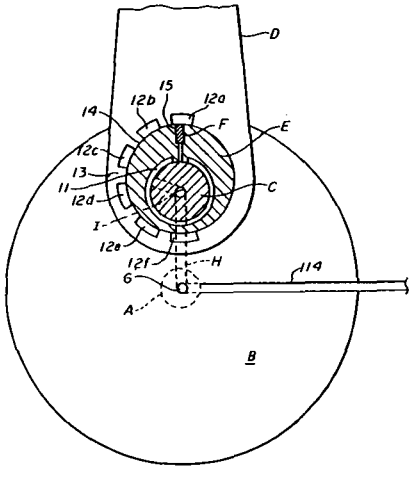
N81-29442*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

AUTOMATIC COMPRESSION ADJUSTING MECHANISM FOR INTERNAL COMBUSTION ENGINES Patent Application

James W. Akkerman, inventor (to NASA) Filed 22 May 1981 17 p

(NASA-Case-MSC-18807-1; US-Patent-Appl-SN-266688) Avail: NTIS HC A02/MF A01 CSCL 20A

A means is provided for controlling the compression pressure in an internal combustion engine having one or more cylinders and subject to widely varying power output requirements. Received between each crank pin and connecting rod is an eccentric sleeve selectively capable of rotation about the crank pin and/or inside the rod and for latching with the rod to vary the effective length of the connecting rod and thereby the clearance volume of the engine. The eccentric normally rotates inside the connecting rod during the exhaust and intake strokes but a latching pawl carried by the eccentric is movable radially outwardly to latch the rod and eccentric together. A control valve responds to intake manifold pressure to time the supply of hydraulic fluid to move the latch-pawl outwardly, varying the rod length to maintain a substantially optimum firing chamber pressure at all intake manifold pressures. NASA



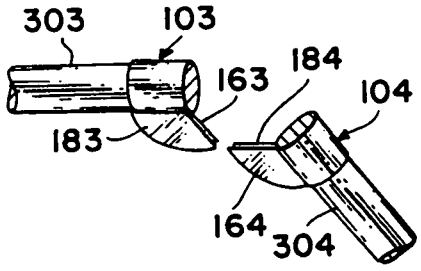
N81-31551*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

UNIVERSAL CONNECTORS FOR JOINING STRINGERS Patent Application

Ernest Harrison, Jr., inventor (to NASA) (Mississippi Methodist Rehabilitation Center, Jackson) Filed 5 Jun. 1981 16 p Sponsored by NASA

(NASA-Case-LAR-12744-1; US-Patent-Appl-SN-270762) Avail: NTIS HC A02/MF A01 CSCL 13K

A lightweight, universal connector that joins stringers at various angles is discussed. The connectors are fabricated from fiber epoxy resin strips that wrap around stringers and have ends, tabs and extend in one general direction. The inside surface of the first tab lies on a plane defined by the joined stringers, and the second tab is separated from the first tab by a distance equal to their thickness. Stringers of different shapes and sizes are joined by alternately bonding the first tab of one connector between the first and second tabs of another connector. Tee joints are formed by web elements which partially wrap around a stringer and have tabs which are offset and bonded between tabs of universal connectors and bonded to another stringer. Sharp corners are trimmed from the tabs and a gusset area remains between the stringers for support. Acute angle through obtuse angle joints are formed by trimming those edges of the tabs which lie against the stringers. NASA



N81-32510* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

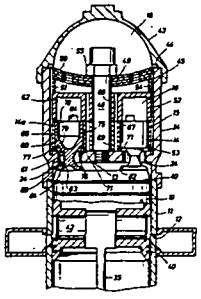
RECIPROCATING ENGINES Patent

James W. Akkerman, inventor (to NASA) Issued 18 Aug. 1981 9 p Filed 31 Oct. 1977 Supersedes N78-11399 (16 - 02, p 0198)

(NASA-Case-MSC-16239-1; US-Patent-4,283,995; US-Patent-Appl-SN-847276; US-Patent-Class-91-410; US-Patent-Class-91-325; US-Patent-Class-91-341R) Avail: US Patent and Trademark Office CSCL 13I

An intake valve arrangement for positively controlling the opening and closing of the poppet valve in a hot gas cylinder in a hydrazine powered engine is described. The poppet valve is operated by the piston and gas pressure only. The poppet valve uses a pneumatic spring which holds the poppet valve against the piston while the valve is opened and closed. To accomplish this, a poppet valve is slidably mounted in a pneumatic spring chamber which reaches a pressure approaching the gas supply pressure and, during the opening of the valve, the spring chamber retains enough pressure to hold the poppet valve onto the piston. In addition, the bottom of the poppet valve can have a suction cup type configuration to hold the poppet valve on the piston during the down stroke.

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



N81-33482* National Aeronautics and Space Administration. Pasadena Office, Calif.

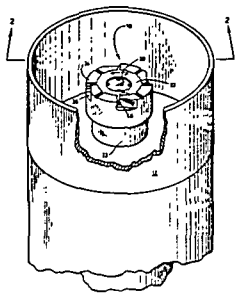
HEAD FOR HIGH SPEED SPINNER HAVING A VACUUM CHUCK Patent

Frank Lombardi, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 28 Jul. 1981 5 p Filed 27 Jun. 1980 Supersedes N80-26661 (18 - 17, p 2274) Sponsored by NASA

(NASA-Case-NPO-15227-1; US-Patent-4,280,689; US-Patent-Appl-SN-163840; US-Patent-Class-269-21; US-Patent-Class-118-50; US-Patent-Class-118-52; US-Patent-Class-427-240) Avail: US Patent and Trademark Office CSCL 13I

The head for a high-speed spinner is characterized by a substantially cylindrical body adapted to be mounted at the distal end of a vertically oriented drive shaft. A vacuum chuck with an upwardly facing chamber is circumscribed by an annular surface for receiving in supported relation a silicon chip. An ordered array of low-pressure cavities is defined about the periphery of the body and connected in communication with the chamber via radially extended bores in order to translate low pressures to the chamber as the head is angularly displaced. A pressure differential is thereby established across the chip for securing it to the head.

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



N81-33483* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

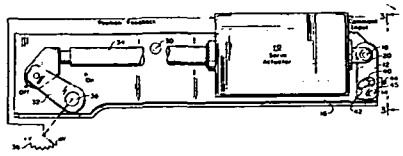
ELECTRICAL SERVO ACTUATOR BRACKET Patent

Ralph V. Sawyer, inventor (to NASA) Issued 16 Jun. 1981 4 p Filed 28 Mar. 1980 Supersedes N80-21327 (18 - 12, p 1521)

(NASA-Case-FRC-11044-1; US-Patent-4,274,038; US-Patent-Appl-SN-135056; US-Patent-Class-318-663; US-Patent-Class-74-89; US-Patent-Class-92-130R) Avail: US Patent and Trademark Office CSCL 13I

An electrical servo actuator is mounted on a support arm which is allowed to pivot on a bolt through a fixed mounting bracket. The actuator is pivotally connected to the end of the support arm by a bolt which has an extension allowed to pass through a slot in the fixed mounting bracket. An actuator rod extends from the servo actuator to a crank arm which turns a control shaft. A short linear thrust of the rod pivots the crank arm through about 90 for full-on control with the rod contracted into the servo actuator, and full-off control when the rod is extended from the actuator. A spring moves the servo actuator and actuator rod toward the control crank arm once the actuator rod is fully extended in the full-off position. This assures the turning of the control shaft to a full-off position. A stop bolt and slot are provided to limit pivot motion. Once fully extended, the spring pivots the motion.

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



39 STRUCTURAL MECHANICS

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

For applications see *05 Aircraft Design, Testing and Performance* and *18 Spacecraft Design, Testing and Performance*.

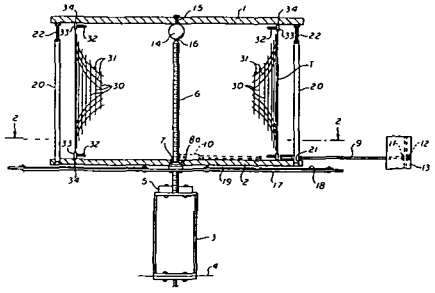
N81-24470*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

COMPRESSION TEST FIXTURE Patent Application

George C. Shanks, inventor (to NASA) (McDonnell Douglas Corp., Long Beach, Calif.) Filed 13 Feb. 1981 11 p Sponsored by NASA

(NASA-Case-MSC-18723-1; US-Patent-Appl-SN-234223) Avail: NTIS HC A02/MF A01 CSCL 20K

An apparatus for compressive testing of a test specimen may comprise vertically spaced upper and lower platen members between which a test specimen may be placed. The platen members are supported by a fixed support assembly. A load indicator is interposed between the upper platen member and the support assembly for supporting the total weight of the upper platen member and any additional weight which may be placed on it. Operating means are provided for moving the lower platen member upwardly toward the upper platen member whereby an increasing portion of the total weight is transferred from the load indicator to the test specimen. The testing apparatus may include devices for limiting the movement of the lower platen member toward the upper platen member to prevent permanent deformation in the test specimen. In one embodiment, the limit devices include a number of rods attached to one of the platen members and a vertically-adjustable extension member engageable with the other platen member. NASA



N81-25400* National Aeronautics and Space Administration. Pasadena Office, Calif.

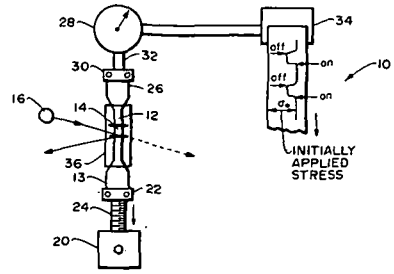
PHOTOMECHANICAL TRANSDUCER Patent

Robert F. Fedors (JPL, California Inst. of Tech., Pasadena) and Mohammad N. Sarbolouki, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 24 Feb. 1981 6 p Filed 15 Dec. 1978 Supersedes N79-14908 (17 - 05, p 0671) Sponsored by NASA

(NASA-Case-NPO-14363-1; US-Patent-4,252,440; US-Patent-Appl-SN-969760; US-Patent-Class-356-216; US-Patent-Class-356-213; US-Patent-Class-356-234; US-Patent-Class-356-32) Avail: US Patent and Trademark Office CSCL 20K

Light absorbing ultra-thin films mounted under a fixed strain exhibit the behavior of an optomechanicalor photomechanical transducer. The transducer responds to light in a quick and reversible manner converting a time-variable light source into a time-variable mechanical stress easily monitored by a device such as a strain gage.

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.

For instrumentation see *35 Instrumentation and Photography*.

N81-26509* National Aeronautics and Space Administration. Pasadena Office, Calif.

UNDERGROUND MINERAL EXTRACTION Patent

Charles G. Miller (JPL, California Inst. of Technology, Pasadena) and James B. Stephens (JPL, California Inst. of Technology, Pasadena) Issued 7 Oct. 1980 13 p Filed 19 Apr. 1978 Sponsored by NASA

(NASA-Case-NPO-14140-1; NASA-Case-NPO-14382-1; US-Patent-4,226,475; US-Patent-Appl-SN-897832; US-Patent-Class-299-13; US-Patent-Class-166-222; US-Patent-Class-166-77; US-Patent-Class-134-17; US-Patent-Class-299-17; US-Patent-Class-299-20; US-Patent-Class-239-562; US-Patent-Class-239-591) Avail: US Patent and Trademark Office CSCL 08I

A method was developed for extracting underground minerals such as coal, which avoids the need for sending personnel underground and which enables the mining of steeply pitched seams of the mineral. The method includes the use of a narrow vehicle which moves underground along the mineral seam and which is connected by pipes or hoses to water pumps at the surface of the Earth. The vehicle hydraulically drills pilot holes during its entrances into the seam, and then directs sideward jets at the seam during its withdrawal from each pilot hole to comminute the mineral surrounding the pilot hole and combine it with water into a slurry, so that the slurried mineral can flow to a location where a pump raises the slurry to the surface.

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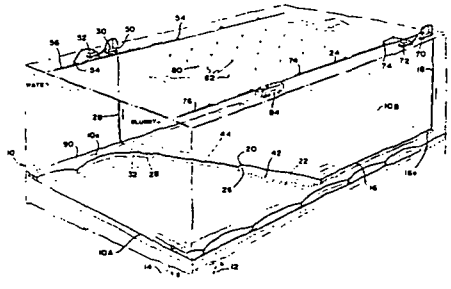

44 ENERGY PRODUCTION AND CONVERSION

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

For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *85 Urban Technology and Transportation.*

N81-22466*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ADVANCED INORGANIC SEPARATORS FOR ALKALINE BATTERIES AND METHOD OF MAKING SAME Patent Application

Dean W. Sheibley, inventor (to NASA) Filed 27 Feb. 1981 18 p

(NASA-Case-LEW-13171-1; US-Patent-Appl-SN-238790) Avail: NTIS HC A02/MF A01 CSCL 10C

A method of forming a flexible, porous battery separator comprising a coating applied to a porous, flexible substrate is discussed. The coating comprises: (1) a thermoplastic rubber based resin which is insoluble and unreactive in the alkaline electrolyte; (2) a polar organic plasticizer which is reactive with the alkaline electrolyte to produce a reaction product which contains a hydroxyl group and/or a carboxylic acid group; and (3) a mixture of polar particulate filler materials which are unreactive with the electrolyte. The mixture comprises at least one first filler material, wherein the volume of the mixture of filler materials is less than 45% of the total volume of the fillers and the binder, the filler surface area per gram of binder is about 20 to 60 sq m/gr, and the amount of plasticizer is sufficient to coat each filler particle. NASA

N81-24519* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

HEAT EXCHANGER AND METHOD OF MAKING Patent

Anthony Fortini and John M. Kazaroff, inventors (to NASA) Issued 20 Jan. 1981 5 p Filed 23 Apr. 1979 Supersedes N79-23383 (17 - 14, p 1850) Division of US Patent Appl. SN-856462, US Patent-4,199,937, filed 30 Nov. 1977

(NASA-Case-LEW-12441-3; US-Patent-4,245,469; US-Patent-Appl-SN-032307; US-Patent-Class-60-204; US-Patent-Class-60-267; US-Patent-Class-239-127.1; US-Patent-4,199,937; US-Patent-Appl-SN-856462) Avail: US Patent and Trademark Office CSCL 10B

A heat exchanger of increased effectiveness is disclosed. A porous metal matrix is disposed in a metal chamber or between walls through which a heat transfer fluid is directed. The porous metal matrix has internal bonds and is bonded to the chamber in order to remove all thermal contact resistance within the composite structure. Utilization of the invention in a rocket chamber is disclosed as a specific use. Also disclosed is a method of constructing the heat exchanger.

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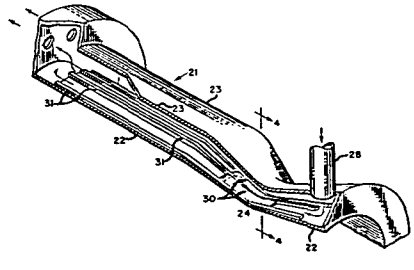


N81-24520* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

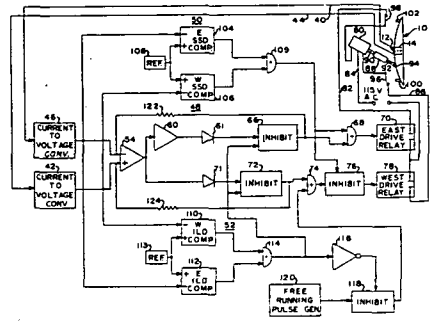
SOLAR TRACKING SYSTEM Patent

Paul R. White and Donald R. Scott, inventors (to NASA) Issued 14 Apr. 1981 6 p Filed 25 Jul. 1979 Supersedes N79-28667 (17 - 19, p 2567)

(NASA-Case-MFS-23999-1; US-Patent-4,262,195; US-Patent-Appl-SN-060435; US-Patent-Class-250-203R; US-Patent-Class-250-209) Avail: US Patent and Trademark Office CSCL 10A

A solar tracker for a solar collector is described in detail. The collector is angularly oriented by a motor wherein the outputs of two side-by-side photodetectors are discriminated as to three ranges: a first corresponding to a low light or darkness condition; a second corresponding to light intensity lying in an intermediate range; and a third corresponding to light above an intermediate range, direct sunlight. The first output drives the motor to a selected maximum easterly angular position; the second enables the motor to be driven westerly at the Earth rotational rate; and the third output, the separate outputs of the two photodetectors, differentially controls the direction of rotation of the motor to effect actual tracking of the Sun.

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



N81-24521* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

TOROIDAL CELL AND BATTERY Patent

William J. Nagle, inventor (to NASA) Issued 14 Apr. 1981 7 p Filed 28 Mar. 1980 Supersedes N80-33857 (18 - 24, p 3299)

(NASA-Case-LEW-12918-1; US-Patent-4,262,064; US-Patent-Appl-SN-134855; US-Patent-Class-429-94; US-Patent-Class-429-120; US-Patent-Class-429-160; US-Patent-Class-429-164) Avail: US Patent and Trademark Office CSCL 10C

A toroidal storage battery designed to handle relatively high amp-hour loads is described. The cell includes a wound core disposed within a pair of toroidal channel shaped electrodes spaced apart by nylon insulator. The shape of the case electrodes of this toroidal cell allows a first planar doughnut shaped surface and the inner cylindrical case wall to be used as a first electrode and a second planar doughnut shaped surface and the outer cylindrical case wall to be used as a second electrode. Connectors may be used to stack two or more toroidal cells together by connecting substantially the entire surface area of the first electrode of a first cell to substantially the entire surface area of the second electrode of a second cell. The central cavity of

each toroidal cell may be used as a conduit for pumping a fluid through the toroidal cell to thereby cool the cell.
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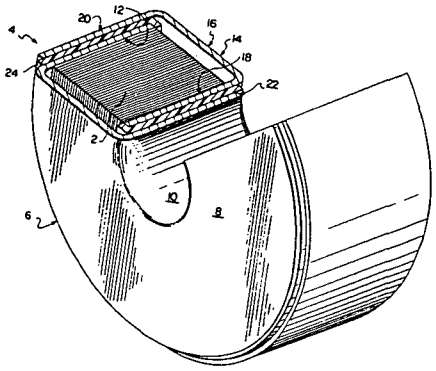
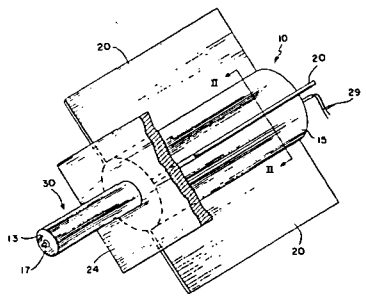


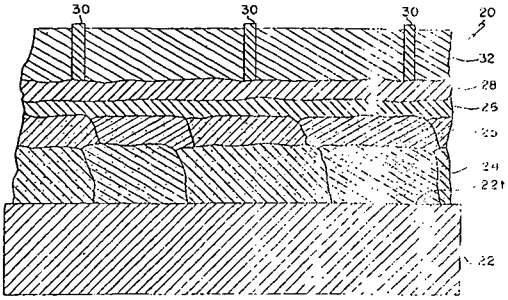
N81-24525*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HEAT PIPE COOLED PROBE Patent Application
Charles J. Camarda and Lana M. Couch, inventors (to NASA) Filed 13 Feb. 1981 10 p
(NASA-Case-LAR-12588-1; US-Patent-Appl-SN-234222) Avail: NTIS HC A02/MF A01 CSCL 10A

The basic heat pipe principle is employed to provide a self-contained passively cooled probe that may be placed into a high temperature environment. The probe consists of an evaporator region of a heat pipe and a sensing instrument. Heat is absorbed as the working fluid evaporates in the probe. The vapor is transported to the vapor space of the condenser region. Heat is dissipated from the condenser region and fins causing condensation of the working fluid, which returns to the probe by gravity and the capillary action of the wick. Working fluid, wick and condenser configurations, and structural materials can be selected to maintain the probe within an acceptable temperature range.
NASA



N81-26553*# National Aeronautics and Space Administration. Pasadena Office, Calif.
SCHOTTKY BARRIER CELL AND METHOD OF FABRICATING IT Patent Application
Richard J. Stirn (JPL, California Inst. of Technology, Pasadena) and Yea-chuan M. Yeh, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 16 Jan. 1981 33 p Sponsored by NASA
(NASA-Case-NPO-13689-4; US-Patent-Appl-SN-225501) Avail: NTIS HC A03/MF A01 CSCL 10A

The cell consists of a barrier formed by a polycrystalline active semiconductor layer of GaAs and a thin metal layer. The active semiconductor layer is grown on a polycrystalline semiconductor layer of germanium, serving as a substrate. The latter is first deposited with submicron crystal sizes and thereafter recrystallized so as to increase the crystal sizes to not less than 5-10 microns in size. The process eliminates the need for an expensive single crystal wafer. T.M.

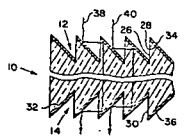


N81-27597*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ADDITIVE FOR ZINC ELECTRODES Patent Application
D. G. Soltis, D. W. Sheibley, and W. J. Nagle, inventors (to NASA) Filed 10 Jun. 1981 7 p
(NASA-Case-LEW-13286-1; US-Patent-Appl-SN-272406) Avail: NTIS HC A02/MF A01 CSCL 10C

An improved zinc electrode for alkaline cells includes up to about ten percent by weight of Ba(OH)2.8H2O with about five percent being preferred. The zinc electrode may or may not be amalgamated with mercury. NASA

N81-27598*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HEAT TRANSPARENT HIGH INTENSITY HIGH EFFICIENCY SOLAR CELL Patent Application
J. C. Evans, Jr., inventor (to NASA) Filed 15 May 1981 13 p
(NASA-Case-LEW-12892-1; US-Patent-Appl-SN-264380) Avail: NTIS HC A02/MF A01 CSCL 10A

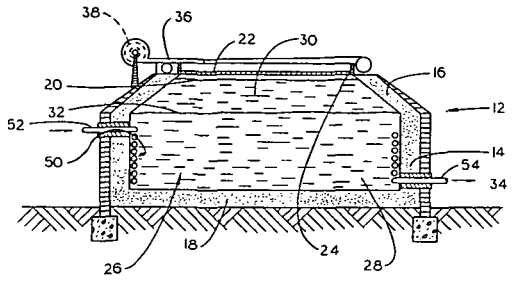
A heat transparent high intensity solar cell with improved efficiency is described. The surface of each solar cell has a plurality of grooves. Each groove has a vertical face and a slanted face that is covered by a reflecting metal. Light rays are reflected from the slanted face through the vertical face where they traverse a photovoltaic junction. As the light rays travel to the slanted face of an adjacent groove, they again traverse the junction. The underside of the reflecting coating directs the light rays toward the opposite surface of solar cell as they traverse the junction again. When the light rays travel through the solar cell and reach the saw toothed grooves on the under side, the process of reflection and repeatedly traversing the junction again takes place. The light rays ultimately emerge from the solar cell. These solar cells are particularly useful at very high levels of insolation because the infrared or heat radiation passes through the cells without being appreciably absorbed to heat the cell. NASA



N81-27599*# National Aeronautics and Space Administration. Pasadena Office, Calif.
A STABLE DENSITY-STRATIFICATION SOLAR POND Patent Application
Fikry L. Lansing, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 30 Apr. 1981 15 p
(Contract NAS7-100)
(NASA-Case-NPO-15419-1; US-Patent-Appl-SN-259208) Avail: NTIS HC A02/MF A01 CSCL 10A

A solar pond for collecting and storing solar thermal energy includes a container having one 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 and in coaxial alignment with the first section. The second section 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 portion substantially filling the second section of the container. The first portion is of a darker color than the second portion and of a greater density. A protective cover plant is removably provided for covering the acceptance opening. NASA

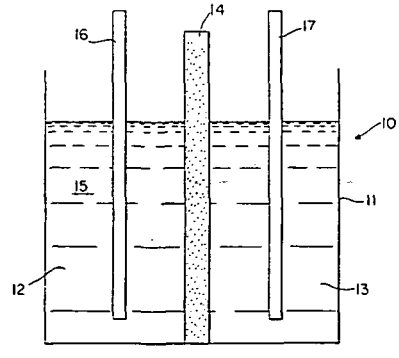


N81-27615*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

POLYVINYL ALCOHOL BATTERY SEPARATOR CONTAINING INERT FILLER Patent Application

Dean W. Sheibley, Li-Chen Hsu, and Michelle A. Manzo, inventors (to NASA) Filed 10 Jun. 1981 14 p
(NASA-Case-LEW-13556-1; US-Patent-Appl-SN-272233) Avail: NTIS HC A02/MF A01 CSCL 10C

A cross-linked polyvinyl alcohol battery separator is disclosed. A particulate filler, inert to alkaline electrolyte of an alkaline battery, is incorporated in the separator in an amount of 1-20% by weight, based on the weight of the polyvinyl alcohol, and is dispersed throughout the product. Incorporation of the filler enhences performance and increases cycle life of alkaline batteries when compared with batteries containing a similar separator not containing filler. Suitable fillers include titanates, silicates, zirconates, aluminates, wood floor, lignin, and titania. Particle size is not greater than about 50 microns. NASA



N81-27616*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

METHOD OF FORMING OXIDE COATINGS Patent Application

G. E. McDonald, inventor (to NASA) Filed 10 Jun. 1981 7 p
(NASA-Case-Lew-13132-1; US-Patent-Appl-SN-272152) Avail: NTIS HC A02/MF A01 CSCL 10A

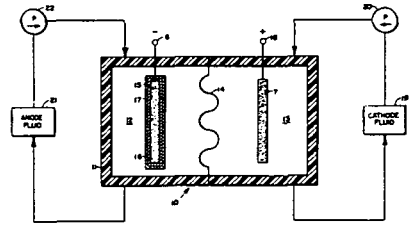
This invention is concerned with an improved plating process for covering a substrate with a black metal oxide film. The invention is particularly directed to making a heating panel for a solar collector. A compound is electrodeposited from an aqueous solution containing cobalt metal salts onto a metal substrate. This compound is converted during plating into a black, highly absorbing oxide coating which contains hydrated oxides. This is achieved by the inclusion of an oxidizing agent in the plating bath. The inclusion of an oxidizing agent in the plating bath is contrary to standard electroplating practice. The hydrated oxides are converted to oxides by treatment in a hot bath, such as boiling water. An oxidizing agent may be added to the hot liquid treating bath. NASA

N81-29524* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

CATALYST SURFACES FOR THE CHROMOUS/CHROMIC REDOX COUPLE Patent

Jose D. Giner (Giner, Inc., Waltham, Mass.) and Kathleen J. Cahill, inventors (to NASA) (Giner, Inc., Waltham, Mass.) Issued 2 Jun. 1981 8 p Filed 27 Jul. 1979 Supersedes N80-18557 (18 - 09, p 1165) Sponsored by NASA
(NASA-Case-LEW-13148-2; US-Patent-4,270,984; US-Patent-Appl-SN-061555; US-Patent-4,192,910; US-Patent-Appl-SN-964754; US-Patent-Class-204-2.1) Avail: U.S. Patent and Trademark Office CSCL 10C

An electricity producing cell of the reduction-oxidation (REDOX) type divided into two compartments by a membrane is disclosed. A ferrous/ferric couple in a chloride solution serves as a cathode fluid to produce a positive electric potential. A chromic/chromous couple in a chloride solution serves as an anode fluid to produce a negative potential. The electrode is an electrically conductive, inert material plated with copper, silver or gold. A thin layer of lead plates onto the copper, silver or gold layer when the cell is being charged, the lead ions being available from lead chloride which has been added to the anode fluid. If the REDOX cell is then discharged, the lead deplates from the negative electrode and the metal coating on the electrode acts as a catalyst to increase current density.
Official Gazette of the U.S. Patent and Trademark Office



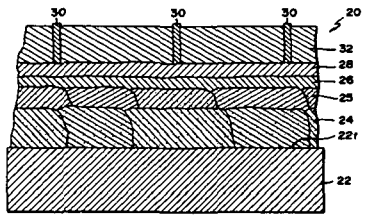
N81-29525* National Aeronautics and Space Administration. Pasadena Office, Calif.

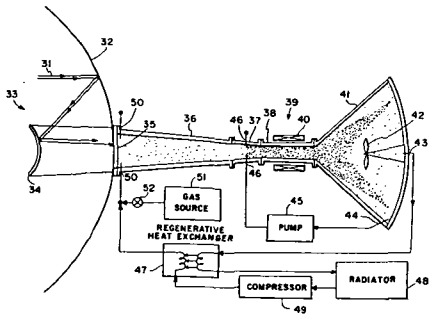
SCHOTTKY BARRIER SOLAR CELL Patent

Richard J. Stirn and Yea-Chuan M. Yeh, inventors (to NASA) (California Inst. of Technology, Pasadena) Issued 14 Jul. 1981 10 p Filed 13 Nov. 1979 Supersedes N80-12549 (18 - 03, p 0352) Continuation-in part of abandoned US Patent Appl. SN-837513, filed 4 May 1976, which is a continuation-in-part of abandoned Patent Appl. SN-597430, filed 21 Jul. 1975 Sponsored by NASA
(NASA-Case-NPO-13689-2; US-Patent-4,278,830; US-Patent-Appl-SN-093714; US-Patent-Appl-SN-837513; US-Patent-Appl-SN-683073; US-Patent-Sppl-SN-597430; US-Patent-Class-136-255; US-Patent-Class-136-258; US-Patent-Class-136-262; US-Patent-Class-357-15; US-Patent-Class-357-30) Avail: U.S. Patent and Trademark Office CSCL 10A

A method of fabricating a Schottky barrier solar cell is described. The cell consists of a thin substrate of low cost material with at least the top surface of the substrate being electrically conductive. A thin layer of heavily doped n-type polycrystalling germanium is deposited on the substrate after a passivation layer is deposited to prevent migration of impurities into the polycrystalline germanium. The polycrystalline germanium is recrystallized to increase the crystal sizes to serve as a base layer on which a thin layer of gallium arsenide is vapor-epitaxilly grown followed by a thermally-grown oxide layer. A metal layer

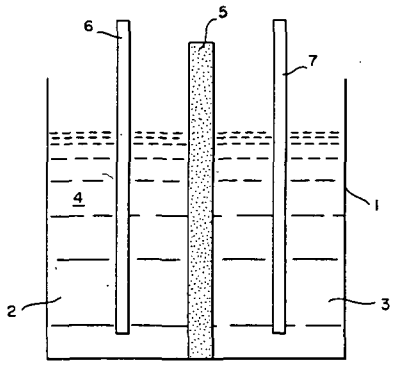
is deposited on the oxide layer and a grid electrode is deposited to be in electrical contact with the top surface of the metal layer. Official Gazette of the U.S. Patent and Trademark Office





N81-29531*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ALKALINE BATTERY CONTAINING A SEPARATOR OF A CROSS-LINKED COPOLYMER OF VINYL ALCOHOL AND UNSATURATED CARBOXYLIC ACID Patent Application
Li-Chen Hsu, Warren H. Philipp, Dean W. Sheibley, and Olga D. Gonzalez-Sanabria, inventors (to NASA) Filed 10 Jul. 1981 12 p
(NASA-Case-LEW-13102-1; US-Patent-Appl-SN-282298) Avail: NTIS HC A02/MF A01 CSCL 10C

A battery separator for an alkaline battery separator comprises a crosslinked copolymer of vinyl alcohol units and unsaturated carboxylic acid units. The crosslinked copolymer is insoluble in water, has excellent zincate diffusion and oxygen gas barrier properties and a low electrical resistivity. A polyaldehyde crosslinking agent is preferred. NASA



51 LIFE SCIENCES (GENERAL)

Includes genetics.

N81-28698* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
INDIRECT MICROBIAL DETECTION Patent
Judd R. Wilkins, inventor (to NASA) Issued 28 Apr. 1981 8 p Filed 17 Aug. 1979 Supersedes N80-11756 (18 - 02, p 0241
(NASA-Case-LAR-12520-1; US-Patent-4,264,728; US-Patent-Appl-SN-067596; US-Patent-Class-435-5; US-Patent-Class-204-1T; US-Patent-Class-204-195B; US-Patent-Class-435-34; US-Patent-Class-435-291) Avail: US Patent and Trademark Office CSCL 06M

The growth of microorganisms in a sample is detected and monitored by culturing microorganisms in a growth medium and detecting a change in potential between two electrodes, separated from the microbial growth by a barrier which is permeable to charged paticles but microorganism impermeable.
Official Gazette of the U.S. Patent and Trademark Office

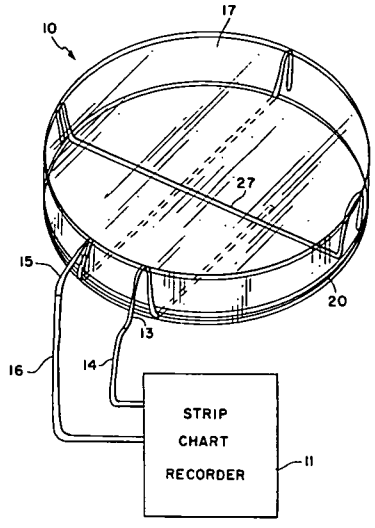
N81-32609*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SOLAR DRIVEN LIQUID METAL MHD POWER GENERATOR Patent Application
Ja H. Lee (Vanderbuilt Univ.) and Frank Hohl, inventors (to NASA) Filed 15 May 1981 15 p
(NASA-Case-LAR-12495-1; US-Patent-Appl-SN-263830) Avail: NTIS HC A02/MF A01 CSCL 10A

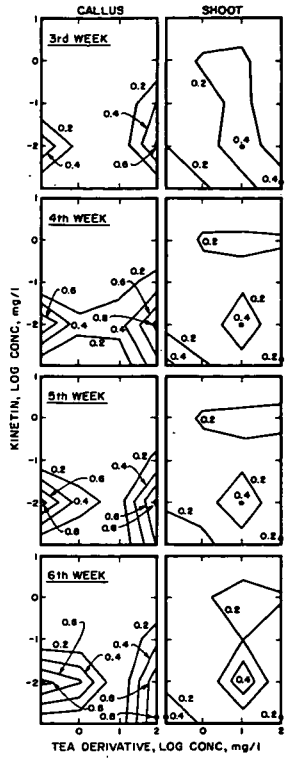
A method for solar electric power generation in space is described. A solar energy collector focuses solar energy onto a solar oven which is attached to a mixer which in turn is attached to the channel of a MHD generator. Gas enters the oven and a liquid metal enters the mixer. The gas/liquid metal mixture is heated by the collected solar energy and moves through the MHD generator thereby generating electrical power. The mixture is then separated and recycled. NASA

N81-29727*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
APPARATUS AND PROCESS FOR MICROBIAL DETECTION AND ENUMERATION Patent Application
Judd R. Wilkins and David C. Grana, inventors (to NASA) Filed 19 Feb. 1981 12 p
(NASA-Case-LAR-12709-1; US-Patent-Appl-SN-235796) Avail: NTIS HC A02/MF A01 CSCL 06C

An apparatus and process for detecting and enumerating specific microorganisms from large volume samples containing numbers of the microorganisms is described. The large volume samples are filtered through a membrane filter to concentrate the microorganisms. The filter is positioned between two absorbent pads previously moistened with a growth medium for the microorganisms. A pair of electrodes are disposed against the filter and the pad-electrode-filter assembly is retained within a petri dish. A cover is positioned on the base of the petri dish

and sealed at the edges by a parafilm seal prior to being electrically connected to a strip chart recorder. NASA





N81-29728*# National Aeronautics and Space Administration. Pasadena Office, Calif.

ENHANCEMENT OF IN VITRO GUAYULE PROPAGATION
Patent Application

M. N. Dastoor (JPL, California Inst. of Tech., Pasadena), W. W. Schubert (JPL, California Inst. of Tech., Pasadena), and G. R. Petersen, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 30 Jun. 1981 22 p
(Contract NAS7-100)
(NASA-Case-NPO-15213-1; US-Patent-Appl-SN-280153) Avail: NTIS HC A02/MF A01 CSCL 06C

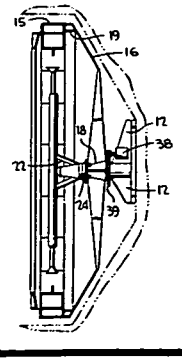
The in vitro propagation of Guayule from a nutrient media containing Guayule tissue is stimulated by adding a substituted trialkyl amine bioinducing agent to the nutrient media. Selective or differential propagation of shoots or callus is obtained by varying the amounts of substituted trialkyl amine present in the nutrient media. The luxuriant growth provided may be processed for its poly isoprene content or may be transferred to a rooting media for production of whole plants as identical clones of the original tissue. Large numbers of Guayule plants having identical desirable properties such as high polyisoprene levels can be produced. NASA

N81-32829* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

BIOCENTRIFUGE SYSTEM CAPABLE OF EXCHANGING SPECIMEN CAGES WHILE IN OPERATIONAL MODE
Patent

Robert R. Belew, inventor (to NASA) Issued 18 Aug. 1981 10 p Filed 30 Apr. 1980 Supersedes N80-24342 (18 - 15, p 1944)
(NASA-Case-MFS-23825-1; US-Patent-4,284,034; US-Patent-Appl-SN-145273; US-Patent-Class-119-17; US-Patent-Class-119-18) Avail: US Patent and Trademark Office CSCL 06B

The centrifuge comprises a generally circular, rotatably mounted frame carrying a plurality of removable and replaceable cages for the animal specimens. Pairs of opposing cages may be removed from the frame while it is rotating by means of a cage exchanger which rotates concentrically within the centrifuge and the speed of which is controlled independently of the frame speed. An image rotator is provided for selective observation of the rotating animals. The system further includes a waste conveyor system, a food supply system, and a water supply system for each cage for creating a life sustaining environment so that the animals can live in the rotating centrifuge for extended periods.
Official Gazette of the U.S. Patent and Trademark Office



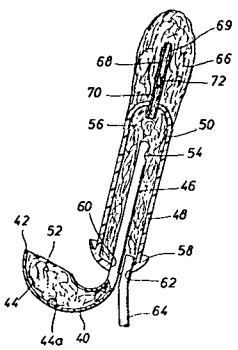
52 AEROSPACE MEDICINE

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

N81-24711* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
URINE COLLECTION DEVICE Patent
Roger B. Michaud, inventor (to NASA) (Martin Marietta Corp., Denver) Issued 27 Jan. 1981 11 p Filed 30 May 1978 Sponsored by NASA
(NASA-Case-MSC-16433-1; US-Patent-4,246,901; US-Patent-Appl-SN-910992; US-Patent-Class-128-295; US-Patent-Class-4-144.3; US-Patent-Class-128-761) Avail: US Patent and Trademark Office CSCL 06B

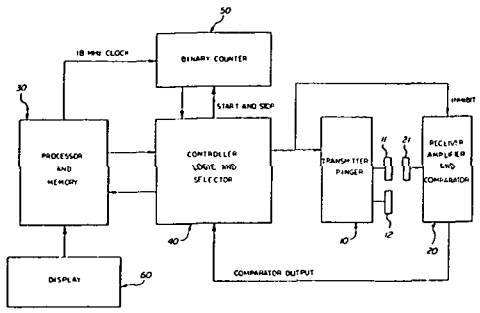
A urine collection device for females is described. It is comprised of a collection element defining a urine collection chamber and an inlet opening into the chamber and is adapted to be disposed in surrounding relation to the urethral opening of the user. A drainage conduit is connected to the collection element in communication with the chamber whereby the chamber and conduit together comprise a urine flow pathway for carrying urine generally away from the inlet. A first body of wicking material is mounted adjacent the collection element and extends at least partially into the flow pathway. The device preferably also comprise a vaginal insert element including a seal portion for preventing the entry of urine into the vagina.

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



N81-24716*# National Aeronautics and Space Administration Lyndon B. Johnson Space Center, Houston, Tex.
APPARATUS FOR DETERMINING CHANGES IN LIMB VOLUME Patent Application
P. K. Bhagat (Kentucky Univ., Lexington) and V. C. Wu, inventors (to NASA) (Kentucky Univ., Lexington) Filed 10 Feb. 1981 14 p Sponsored by NASA
(NASA-Case-MSC-18759-1; US-Patent-Appl-SN-233270) Avail: NTIS HC A02/MF A01 CSCL 06B

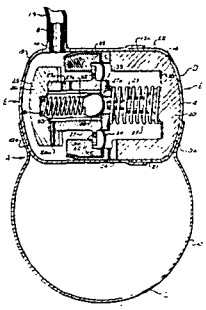
A measuring apparatus for determining changes in the volume of limbs or other body extremities by determining the cross-sectional area of such limbs is described. It is comprised of a transmitter including first and second transducers and a receiver for positioning on the surface of the limb. The distances between the receiver crystal and the first and second transducers are represented by respective first and second chords (d sub 1 d sub 2) of the cross-section of the limb and the predetermined distance between the first and second transducers is represented by a third chord (d sub 3). The measuring apparatus also includes a Pinger and associated electrical circuitry for generating acoustic pulses at the transducers. The travel time of the acoustic pulses along the D sub 1, D sub 2 chords is derived. A computer is connected to the receiver for computing the area of the limb cross-section utilizing these signals. NASA



N81-25660* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PROSTHETIC URINARY SPHINCTER Patent
Curtis R. Helms and Harold M. Smyly, inventors (to NASA) Issued 17 Mar. 1981 4 p Filed 12 Oct. 1978 Supersedes N79-14756 (17 - 05, p 0646)
(NASA-Case-MFS-23717-1; US-Patent-4,256,093; US-Patent-Appl-SN-950877; US-Patent-Class-128-1R; US-Patent-Class-128-346; US-Patent-Class-128-Dig.25; US-Patent-Class-137-493) Avail: US Patent and Trademark Office CSCL 06B

A pump/valve unit for controlling the inflation and deflation of a urethral collar in a prosthetic urinary sphincter device is described. A compressible bulb pump defining a reservoir was integrated with a valve unit for implantation. The valve unit includes a movable valve member operable by depression of a flexible portion of the valve unit housing for controlling fluid flow between the reservoir and collar; and a pressure sensing means which operates the valve member to relieve an excess pressure in the collar should too much pressure be applied by the patient.

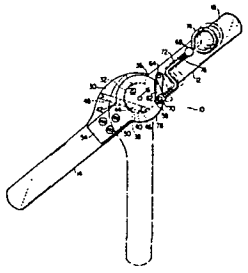
Official Gazette of the U.S. Patent and Trademark Office



N81-25661* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
LOCKING MECHANISM FOR ORTHOPEDIC BRACES Patent
Jireh I. Chao (Howard Univ.) and Charles H. Epps, Jr. (Howard Univ.) Issued 24 Feb. 1981 7 p Filed 20 May 1977 Supersedes N77-27694 (15 - 18, p 2426) Continuation of abandoned US Patent Appl. SN-676958, Filed 14 Apr. 1976 Sponsored by NASA
(NASA-Case-GSC-12082-2; US-Patent-4,252,111; US-Patent-Appl-SN-798976; US-Patent-Appl-SN-676958; US-Patent-Class-128-80F) Avail: US Patent and Trademark Office CSCL 06B

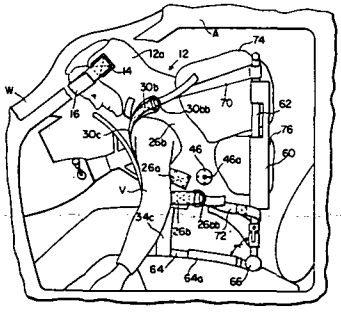
An orthopedic brace locking mechanism is described which under standing or walking conditions cannot be unlocked, however under sitting conditions the mechanism can be simply unlocked so as to permit bending of the patient's knee. Other features of the device include: (1) the mechanism is rendered operable, and inoperable, dependent upon the relative inclination of the brace with respect to the ground; (2) the mechanism is automatically locked under standing or walking conditions and

is manually unlocked under sitting conditions; and (3) the mechanism is light in weight and is relatively small in size.
Official Gazette of the U.S. Patent and Trademark Office



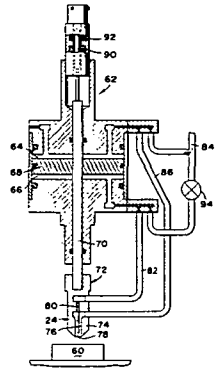
N81-25662* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SPINE IMMOBILIZATION APPARATUS Patent
Kenneth H. Lambson (Lambson (Kenneth) and Associates) and Hubert C. Vykukal, inventors (to NASA) Issued 14 Apr. 1981 7 p Filed 13 Jul. 1979 Supersedes N79-30921 (17 - 21, p 2865)
(NASA-Case-ARC-11167-1; US-Patent-4,261,349; US-Patent-Appl-SN-057526; US-Patent-Class-128-89R) Avail: US Patent and Trademark Office CSCL 06B

The apparatus makes use of a normally flat, flexible bladder filled with beads or micro-balloons that form a rigid mass when the pressure within the bladder is decreased below ambient through the use of a suction pump so that the bladder can be conformed to the torso of the victim and provide the desired restraint. The bladder is strapped to the victim prior to being rigidified by an arrangement of straps which avoid the stomach area. The bladder is adapted to be secured to a rigid support, i.e., a rescue chair, so as to enable removal of a victim after the bladder has been made rigid. A double sealing connector is used to connect the bladder to the suction pump and a control valve is employed to vary the pressure within the bladder so as to soften and harden the bladder as desired.
Official Gazette of the U.S. Patent and Trademark Office



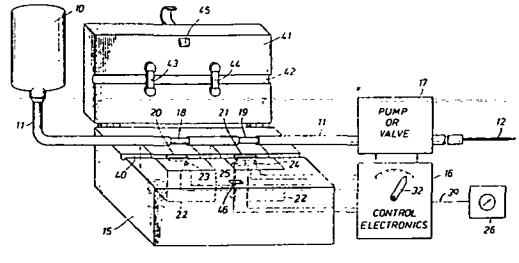
N81-26697*# National Aeronautics and Space Administration. Pasadena Office, Calif.
SYSTEM FOR MOVING A PROBE TO FOLLOW MOVEMENTS OF TISSUE Patent Application
Cyril Feldstein (JPL, California Inst. of Tech., Pasadena), Thomas W. Andrews (JPL, California Inst. of Tech., Pasadena), Donald W. Crawford (JPL, California Inst. of Tech., Pasadena), and Mark A. Cole, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 15 May 1981 15 p
(Contract NAS7-100)
(NASA-Case-NPO-15197-1; US-Patent-Appl-SN-263957) Avail: NTIS HC A02/MF A01 CSCL 06B

An apparatus is described for moving a probe that engages moving living tissue such as a heart or an artery that is penetrated by the probe, which moves the probe in synchronism with the tissue to maintain the probe at a constant location with respect to the tissue. The apparatus includes a servo positioner which moves a servo member to maintain a constant distance from a sensed object while applying very little force to the sensed object, and a follower having a stirrup at one end resting on a surface of the living tissue and another end carrying a sensed object adjacent to the servo member. NASA



N81-24717*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
BIOMEDICAL FLOW SENSOR Patent Application
H. Eugene Winkler, inventor (to NASA) Filed 16 Apr. 1981 14 p
(NASA-Case-MSC-18761-1; US-Patent-Appl-SN-254688) Avail: NTIS HC A02/MF A01 CSCL 06B

A biomedical flow sensor for intravenous systems is described. The device includes a packagable unit of a bottle, tubing and hypodermic needle which can be pre-sterilized and is disposable. The tubing has spaced tubular metal segments. The temperature of the metal segments and the fluid flow is sensed by thermistors and at a downstream location heat is input by a resistor to the metal segment by control electronics. The fluid flow and the electrical power required of the resistor to maintain a constant temperature differential between the tubular metal segments is a measurable function of fluid flow through the tubing. The differential temperature measurement is made in control electronics and also can be used to control a flow control valve or pump on the tubing to maintain a constant flow in the tubing and to shut off the tubing when air is present. NASA



N81-27783* National Aeronautics and Space Administration. Pasadena Office, Calif.
MEDICAL DIAGNOSIS SYSTEM AND METHOD WITH MULTISPECTRAL IMAGING Patent
Victor J. Anselmo (JPL, California Inst. of Technology, Pasadena) and Terrence H. Reilly, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 16 Oct. 1979 10 p Filed 28 Nov. 1977 Sponsored by NASA
(NASA-Case-NPO-14402-1; US-Patent-4,170,987; US-Patent-Appl-SN-855364; US-Patent-Class-128-665; US-Patent-Class-356-407; US-Patent-Class-356-406; US-Patent-Class-356-416) Avail: US Patent and Trademark Office CSCL 06B

A skin diagnosis system includes a scanning and optical

arrangement whereby light reflected from each incremental area (pixel) of the skin is directed simultaneously to three separate light filters, e.g., IR, red, and green. As a result, the three devices simultaneously produce three signals which are directly related to the reflectance of light of different wavelengths from the corresponding pixel. These three signals for each pixel after processing are used as inputs to one or more output devices to produce a visual color display and/or a hard copy color print, for one usable as a diagnostic aid by a physician.

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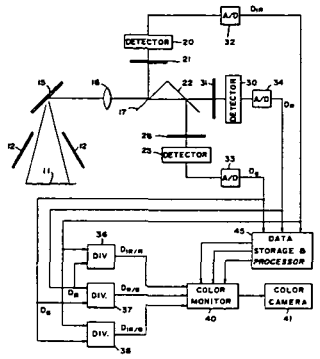
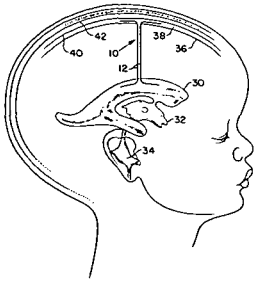


N81-27786*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ION BEAM SPUTTER-ETCHED VENTRICULAR CATHETER FOR HYDROCEPHALUS SHUNT Patent Application

Bruce Banks, inventor (to NASA) Filed 10 Jun. 1981 11 p (NASA-Case-LEW-13107-1; US-Patent-Appl-SN-272407) Avail: NTIS HC A02/MF A01 CSCL 06B

A cerebrospinal fluid shunt in the form of a ventricular catheter for controlling the condition of hydrocephalus by relieving the excessive cerebrospinal fluid pressure is described. A method for fabrication of the catheter and shunting the cerebral fluid from the cerebral ventricles to other areas of the body is also considered. Shunt flow failure occurs if the ventricle collapses due to improper valve function causing overdrainage. The ventricular catheter comprises a multiplicity of inlet microtubules. Each microtubule has both a large openings 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 microtubule by directing sn ion beam through an electro formed metal mesh mask producing perforations. NASA



N81-28740* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

URINE COLLECTION APPARATUS

Roger B. Michaud, inventor (to NASA) (Martin Marietta Aerospace, Denver) 2 Jun. 1981 8 p Filed 27 Apr. 1979 Supersedes N79-23657 (17 - 14, p 1887) Sponsored by NASA (NASA-Case-MSC-18381-1; US-Patent-4,270,539; US-Patent-Appl-SN-034531; US-Patent-Class-128-295; US-Patent-Class-4-144.3) Avail: US Patent and Trademark Office CSCL 06B

A urine collection device for females comprises an interface body with an interface surface for engagement with the user's body. The interface body comprises a forward portion defining a urine-receiving bore which has an inlet in the interface surface adapted to be disposed in surrounding relation to the urethral opening of the user. The interface body also has a rear portion integrally adjoining the forward portion and a non-invasive vaginal seal on the interface surface for sealing the vagina of the user from communication with the urine-receiving bore. An absorbent pad is removably supported on the interface body and extends laterally therefrom. A garment for supporting the urine collection is also disclosed.

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

N81-29763* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SWEAT COLLECTION CAPSULE Patent

John E. Greenleaf and Robert W. Delaplaine, inventors (to NASA) Issued 26 Feb. 1981 6 p Filed 19 Apr. 1978 Supersedes N78-22720 (16 - 13, p 1754) (NASA-Case-ARC-11031-1; US-Patent-4,190,060; US-Patent-Appl-SN-897828; US-Patent-Class-128-760; US-Patent-Class-128-275) Avail: US Patent and Trademark Office CSCL 06B

A sweat collection capsule permitting quantitative collection of sweat is described. The device consists of a frame held immobile on the skin, a closure secured to the frame and absorbent material located next to the skin in a cavity formed by the frame and the closure. The absorbent material may be removed from the device by removing the closure from the frame while the frame is held immobile on the skin.

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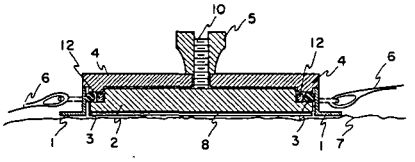
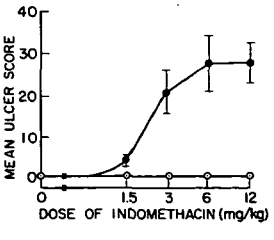


N81-29764* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

INDOMETHACIN-ANTIHISTAMINE COMBINATION FOR GASTRIC ULCERATION CONTROL Patent

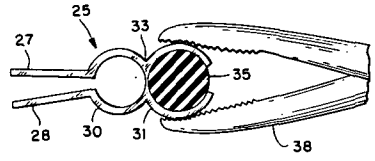
Patrica A. Brown (San Jose State Univ.) and Joan V. Danellis, Inventors (to NASA) (San Jose State Univ.) Issued 21 Jul. 1981 8 p Filed 10 Nov. 1977 Supersedes N78-11692 (16 - 02, p 236) Sponsored by NASA (NASA-Case-ARC-11118-1; US-Patent-4,279,906; US-Patent-Appl-SN-850504; US-Patent-Class-424-247; US-Patent-Class-424-267; US-Patent-Class-424-274) Avail: U.S. Patent and Trademark Office CSCL 06B

An anti-inflammatory and analgesic composition containing reduction of the state space dimension by elimination of superfluous generalized coordinates; and (2) the computation of instantaneous velocity changes occurring during the impact, and the subsequent computation of constraint forces, the constraints remain satisfied for the period of their retention. It is shown that the latter approach is computationally more efficient. Detailed algorithms are also presented. E.A.K.



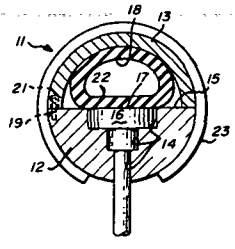
N81-29768*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LOW X-RAY ABSORPTION ANEURISM CLIPS Patent Application
Robert M. Baucom, inventor (to NASA) Filed 15 May 1981 11 p
(NASA-Case-LAR-12650-1; US-Patent-Appl-SN-264381) Avail: NTIS HC A02/MF A01 CSCL 06B

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. NASA



N81-33804*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
NON-INVASIVE METHOD AND APPARATUS FOR MEASURING PRESSURE WITHIN A PLIABLE VESSEL
Masashi Shimizu 19 Feb. 1981 14 p
(NASA-Case-ARC-11264-1; US-Patent-Appl-SN-235866) Avail: NTIS HC A02/MF A01 CSCL 06B

A non-invasive method and apparatus for measuring pressure within a pliable vessel such as a blood vessel are described. The blood vessel is clamped by means of a clamping structure having a first portion housing a pressure sensor, and a second portion extending over the remote side of the blood vessel for pressing the blood vessel into engagement with the pressure sensing device. The pressure sensing device includes a flat deflectable diaphragm portion arranged to engage the blood vessel. In one embodiment, the clamp structure includes first and second semicylindrical members held together by retaining rings. In a second embodiment the clamp structure is of one piece construction having a solid semicylindrical portion and a hollow semicylindrical portion with a longitudinal slot in the hollow semicylindrical portion through which to slip the blood vessel. In a third embodiment, an elastic strap is employed for clamping the blood vessel against the pressure sensing device. NASA

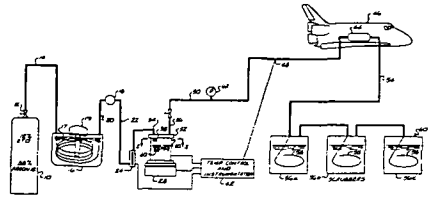


54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

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

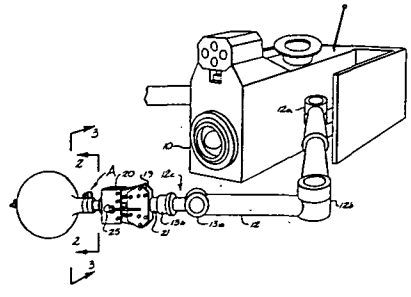
N81-24724* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
SYSTEM FOR STERILIZING OBJECTS Patent
Coleman J. Bryan, Edward E. Wright, Jr., and Clyde V. Moyers, inventors (to NASA) Issued 10 Feb. 1981 4 p Filed 8 Jun. 1979 Supersedes N79-33848 (17 - 24, p 3263)
(NASA-Case-KSC-11085-1; US-Patent-4,250,143; US-Patent-Appl-SN-046739; US-Patent-Class-422-109; US-Patent-Class-422-3; US-Patent-Class-422-27; US-Patent-Class-422-30; US-Patent-Class-422-34; US-Patent-Class-261-79A) Avail: US Patent and Trademark Office CSCL 06K

A system for producing a stream of humidified sterilizing gas for sterilizing objects such as the water systems of space vehicles and the like includes a source of sterilant gas which is fed to a mixing chamber which has inlet and outlet ports. The level of the water only partially fills the mixing chamber so as to provide an empty space adjacent the top of the chamber. A heater is provided for heating the water in the chamber so as to produce a humidified atmosphere. The sterilant gas is fed through an arcuate shaped tubular member connected to the inlet port of the mixing chamber for producing a vortex type of flow of sterilant gas into the chamber for humidifcation. A tubular member extends from the mixing chamber for supplying the humidified sterilant gas to the object for being sterilized. Scrubbers are provided for removing the sterilant gas after use.
Official Gazette of the U.S. Patent and Trademark Office



N81-26718* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PNEUMATIC INFLATABLE END EFFECTOR Patent
Keith H. Clark and James D. Johnston, inventors (to NASA) Issued 16 Jun. 1981 4 p Filed 22 Sep. 1978 Supersedes N78-32724 (16 - 23, p 2133)
(NASA-Case-MFS-23696-1; US-Patent-4,273,505; US-Patent-Appl-SN-945044; US-Patent-Class-414-735; US-Patent-Class-294-93; US-Patent-Class-414-4; US-Patent-Class-414-744A) Avail: US Patent and Trademark Office CSCL 13I

The invention relates to an end effector device for robot or teleoperated type space vehicle which includes an inflatable balloon member carried on the end of tubular member which has a hollow center or conduit through which a suitable pressurized fluid is supplied. The device may be inserted into a variety of shaped openings or truss-type structures for handling in space.
Official Gazette of the U.S. Patent and Trademark Office



N81-27806* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HELMET WEIGHT SIMULATOR Patent
Billy R. Ashworth, Alton C. Hall, and Clyde E. Clark, inventors (to NASA) Issued 28 Apr. 1981 4 p Filed 30 May 1979

Supersedes N79-25761 (17 - 16, p 2179)
(NASA-Case-LAR-12320-1; US-Patent-4,264,310; US-Patent-Appl-SN-043913; US-Patent-Class-434-59) Avail: US Patent and Trademark Office CSCL 05H

A device for providing acceleration cues to the helmet of a simulator pilot is described. Pulleys are attached to both shoulders of the pilot. A cable is attached to both sides of the helmet and extends through the pulleys to a takeup reel that is controlled by a torque motor. Control signals are applied to a servo system including the torque motor, the takeup reel and a force transducer which supplies the feedback signal. In one embodiment of the invention the force transducer is in the cable and in another it is in the takeup reel.

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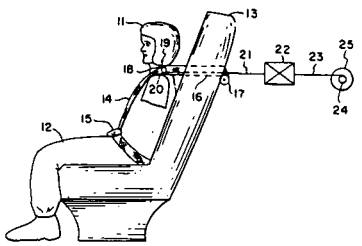
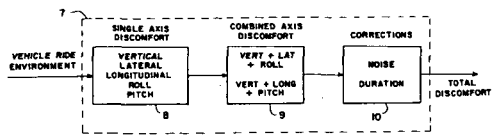


N81-31848*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
RIDE QUALITY METER Patent Application
Jack E. Leatherwood, Sherman A. Clevenson, Thomas K. Dempsey, and David G. Stephens, inventors (to NASA) Filed 22 May 1981 26 p
(NASA-Case-LAR-12882-1; US-Patent-Appl-SN-267179) Avail: NTIS HC A03/MF A01 CSCL 05H

The invention automatically transforms vibration and noise measurements into a single number index of passenger discomfort. The noise measurements are converted into a noise discomfort value. The vibrations are converted into single axis discomfort values which are then converted into a combined axis discomfort value. The combined axis discomfort value is corrected for time duration and then summed with the noise discomfort value to obtain a total discomfort value. T.M.



60 COMPUTER OPERATIONS AND HARDWARE

Includes computer graphics and data processing.

For components see *33 Electronics and Electrical Engineering*.

N81-27814* National Aeronautics and Space Administration. Pasadena Office, Calif.
HIGH-SPEED MULTIPLEXING OF KEYBOARD DATA INPUTS Patent
Tage O. Anderson, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 28 Apr. 1981 8 p Filed 29 Dec. 1978 Supersedes N79-14797 (17 - 05, p 0654) Sponsored by NASA
(NASA-Case-NPO-14554-1; US-Patent-4,264,984; US-Patent-Appl-SN-974473; US-Patent-Class-364-900; US-Patent-Class-364-200; US-Patent-Class-370-58) Avail: US Patent and Trademark Office CSCL 09B

A high speed multiplexing system is described in which keyboard entered data is sequentially and automatically sampled by the multiplexing system for input to a computer. A sequencer is provided which sequentially and automatically controls the multiplexer to sample each keyboard input in accordance with a predetermined sampling sequence. Whenever keyboard entered data appears on input lines to the multiplexer, the system inputs the keyboard data to the computer during a brief time interval in which the multiplexer remains at the particular keyboard address or port. Thus, a high speed sampling circuit is provided whereby the only operator action required is data entry through a keyboard. Priority or interrupt systems are not required.

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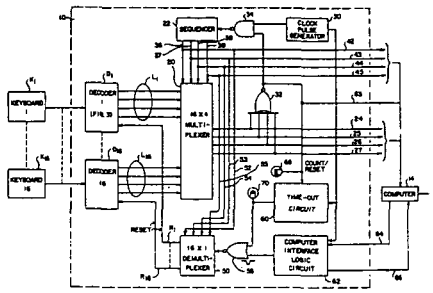
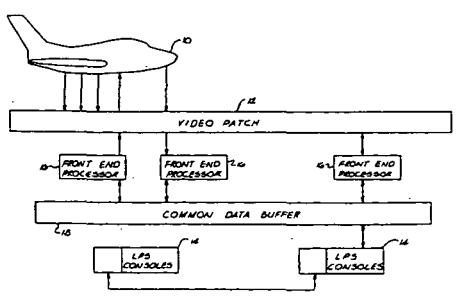


62 COMPUTER SYSTEMS

Includes computer networks.

N81-24779* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
COMMON DATA BUFFER SYSTEM Patent
Frank Byrne, inventor (to NASA) Issued 3 Mar. 1981 11 p Filed 23 Mar. 1979 Supersedes N79-23674 (17 - 14, p 1891)
(NASA-Case-KSC-11048-1; US-Patent-4,254,464; US-Patent-Appl-SN-023437; US-Patent-Class-364-200;) Avail: US Patent and Trademark Office CSCL 09B

A high speed common data buffer system is described for providing an interface and communications medium between a plurality of computers utilized in a distributed computer complex forming part of a checkout, command and control system for space vehicles and associated ground support equipment. The system includes the capability for temporarily storing data to be transferred between computers, for transferring a plurality of interrupts between computers, for monitoring and recording these transfers, and for correcting errors incurred in these transfers. Validity checks are made on each transfer and appropriate error notification is given to the computer associated with that transfer. Official Gazette of the US Patent and Trademark Office



71 ACOUSTICS

Includes sound generation, transmission and attenuation.

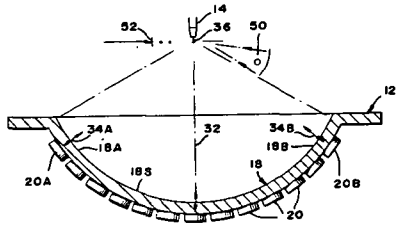
For noise pollution see *45 Environment Pollution*.

N81-27887*# National Aeronautics and Space Administration. Pasadena Office, Calif.

ACOUSTIC SUSPENSION SYSTEM Patent Application

Mark C. Lee, inventor (to NASA) Filed 12 Jun. 1981 13 p (NASA-Case-NPO-15435-1; US-Patent-Appl-SN-272837) Avail: NTIS HC A02/MF A01 CSCL 20A

A device for acoustically supporting small objects under 1 mm diameter, such as hollow glass spheres during processing into nuclear fusion target pellets is described. The acoustic levitation system utilizes single acoustic source and a small reflector to stably levitate an object while the object is processed by coating or heating. The concave acoustic source is located on opposite sides of its axis and vibrates towards and away from a focal point to generate a converging acoustic field. A small reflector is located near the focal point, to create an intense acoustic field that supports a small object near the reflector. The reflector can be located about one half wavelength from the focal point and can be concavely curved to a radius of curvature of about one half the wavelength, to stably support an object one quarter wavelength from the reflector. NASA



74 OPTICS

Includes light phenomena.

N81-22894*# National Aeronautics and Space Administration. Pasadena Office, Calif.

FOCAL PLANE ARRAY OPTICAL PROXIMITY SENSOR Patent Application

Alan R. Johnston, inventor (to NASA) (JPL, California Inst. of Technology., Pasadena) Filed 11 Mar. 1981 18 p (Contract NAS7-100)

(NASA-Case-NPO-15155-1; US-Patent-Appl-SN-242797) Avail: NTIS HC A02/MF A01 CSCL 20F

An optical proximity sensor with an illuminator assembly which includes an illuminator lens and a plurality of light emitting diodes located at first predetermined positions along the focal plane of the illuminator is lens is presented. A detector assembly including a detector lens and a plurality of photodiodes located at second predetermined positions along the focal plane of the detector lens is also provided. The two lenses are spaced apart in accordance with the configuration of the light emitting diodes and the photodiodes to define a predetermined detection volume. Each light emitting diode has a corresponding photodiode, and their relative positions on their respective focal planes determine the detection volume defined by their overlapping fields of view. NASA

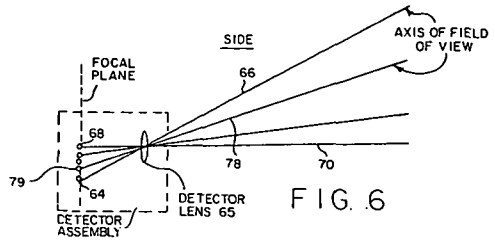


FIG. 6

N81-24900* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

FLUORESCENT RADIATION CONVERTER Patent

Walter Viehmann, inventor (to NASA) Issued 14 Apr. 1981 9 p Filed 11 Jan. 1980 Supersedes N80-18261 (18 - 09, p 1125)

(NASA-Case-GSC-12528-1; US-Patent-4,262,206; US-Patent-Appl-SN-111439; US-Patent-Class-250-483; US-Patent-Class-250-368) Avail: US Patent and Trademark Office CSCL 20F

A fluorescence radiation converter is described which includes a substantially undoped optically transparent substrate and a waveshifter coating deposited on at least one portion of the substrate for absorption of radiation and conversion of fluorescent radiation. The coating is formed to substantially 1000 g/liter of a solvent, 70 to 200 g/liter of an organic polymer, and 0.2 to 25 g/liter of at least one organic fluorescent dye. The incoming incident radiation impinges on the coating. Radiation is absorbed by the fluorescent dye and is re-emitted as a longer wavelength radiation. Radiation is trapped within the substrate and is totally internally reflected by the boundary surface. Emitted radiation leaves the substrate ends to be detected.

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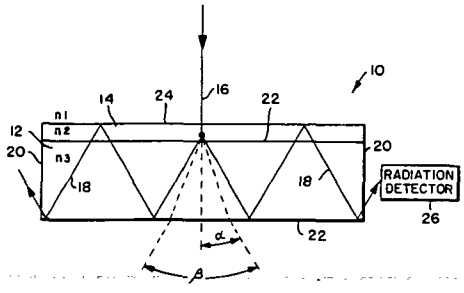


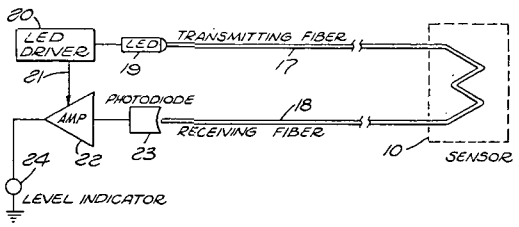
N81-24907*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

APPARATUS FOR FIBER OPTIC LIQUID LEVEL SENSING Patent Application

Madan Sharma, inventor (to NASA) (TRW, Inc., Redondo Beach, Calif.) Filed 19 Feb. 1981 15 p Sponsored by NASA (NASA-Case-MSC-18674-1; US-Patent-Appl-SN-235363) Avail: NTIS HC A02/MF A01 CSCL 20F

A liquid level sensor particularly adapted for use in cryogenic systems is described. It is in the form of a sawtooth-shaped unclad optical fiber and has two liquid contacting points and a scatter-producing bend at least in an input leg of the optical fiber, to increase sensitivity. A pulsed light emitting diode (LED) energizes the sensor input leg through a connecting optical fiber and a second connecting optical fiber conveys light pulses passing through the sensor to a photodiode. The photodiode develops an electrical signal which is a function of attenuation through the sensor, the latter being greatest when the sensor contacting points are in physical contact with the liquid. Processing

of the pulsed photodiode output is effected in an amplifier synchronously enabled during the occurrence of the LED pulses.
NASA



N81-29963* National Aeronautics and Space Administration. Pasadena Office, Calif.
INTERFEROMETER Patent
James B. Breckinridge (California Inst. of Technology, Pasadena), Robert H. Norton (California Inst. of Technology, Pasadena), and Rudolf A. Schindler, inventors (to NASA) (California Inst. of Technology, Pasadena) Issued 14 Jul. 1981 7 p Filed 9 May 1979 Supersedes N79-23777 (17 - 14, p 1906) Sponsored by NASA
(NASA-Case-NPO-14448-1; US-Patent-4,278,351; US-Patent-Appl-SN-037560; US-Patent-Class-356-345; US-Patent-Class-356-346) Avail: U.S. Patent and Trademark Office CSCL 20F

A high resolution interferometer is described. The interferometer is insensitive to slight misalignment of its elements, avoids channeling in the spectrum, generates a maximum equal path fringe contrast, produces an even two sided interferogram without critical matching of the wedge angles of the beamsplitter and compensator wedges, and is optically phase tunable. The interferometer includes a mirror along the path of each beam component produced by the beamsplitter, for reflecting the beam component from the beamsplitter, for reflecting the beam component from the beamsplitter to a corresponding retroreflector and for reflecting the beam returned by the retroreflector back to the beamsplitter. A wedge located along each beam component path, is large enough to cover the retroreflector, so that each beam component passes through the wedge during movement towards the retroreflector and away therefrom.
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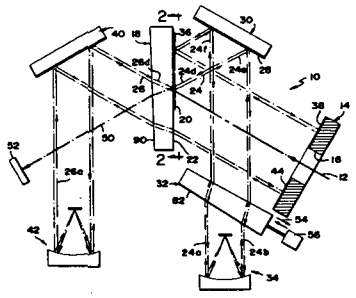

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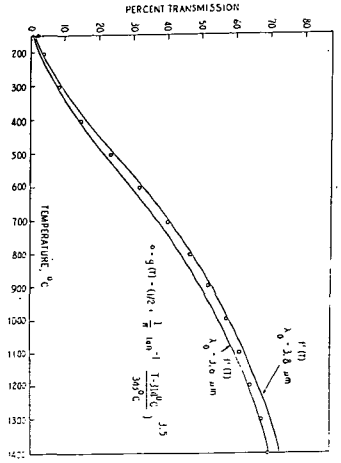
76 SOLID-STATE PHYSICS

Includes superconductivity.
For related information, see also *33 Electronics and Electrical Engineering* and *36 Lasers and Masers*.

N81-30012*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
APPARATUS AND METHOD FOR HEATING A MATERIAL IN A TRANSPARENT AMPOULE Patent Application
Lawrence R. Holland, inventor (to NASA) (Athens Coll.) Filed 30 Jun. 1981 18 p
(NASA-Case-MFS-25436-1; US-Patent-Appl-SN-280151) Avail: NTIS HC A02/MF A01 CSCL 20L

A material within a fused silica ampoule is heated by radiation through the wall of the ampoule, while a cooling gas is simultaneously passed around the ampoule. The radiation is passed through a screen of fused silica so as to remove those components capable of directly heating the silica. This increases the temperature of the material within the ampoule above the strain point of the ampoule, and maintains the exterior of the ampoule cool enough to prevent rupturing the ampoule.
NASA



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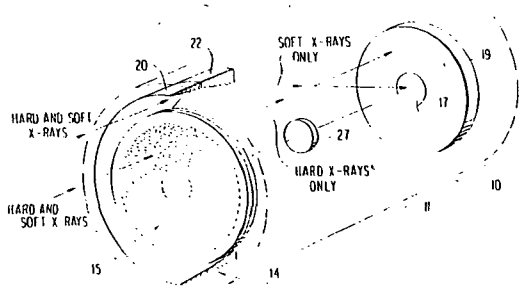
89 ASTRONOMY

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

N81-34122*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
EXTENDED RANGE X-RAY TELESCOPE
Richard B. Hoover 15 May 1981 16 p refs
(NASA-Case-MFS-25282-1; US-Patent-Appl-SN-263828) Avail: NTIS HC A02/MF A01 CSCL 03A

An X-ray telescope system is described which is designed for use on sounding rockets and satellites to investigate solar X-ray phenomena and cosmic X-ray sources. The system comprises a tubular mount having a collecting region at one axial end for receiving X-rays from a remote source, and a detector region remote from the one axial end. A soft X-ray/XUV subsystem associated with the collecting region directs only relatively soft, near on-axis X-rays/XUV radiation incident on a first portion of the collecting region into a first detector. A hard X-ray subsystem associated with the collecting region directs only relatively hard near on-axis X-rays incident on a second portion of the collecting region into a second detector.
NASA



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	13. Type of Report and Period Covered
12. Sponsoring Agency Name and Address	14. Sponsoring Agency Code

15. Supplementary Notes

Section 1: Abstracts

16. Abstract

This bibliography is issued in two sections: Section 1 - Abstracts, and Section 2 - Indexes. This issue of the Abstract Section cites 165 patents and applications for patent introduced into the NASA scientific and technical information system during the period of July 1981 through December 1981. Each entry of the Abstract Section consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or application for patent.

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