NASA SP-7039(11)
Section 1
Abstracts

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

JULY 1977

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA SP-7039(11) NASA Patent Abstracts Bibliography (Sect. 1 • Abstracts) JULY 1977

ACCESSION NUMBER RANGES

Bibliography Number	*STAR Accession Numbers*
NASA SP-7039(04)	N69-20701–N73-33931
NASA SP-7039(05)	N74-10001–N74-21629
NASA SP-7039(06)	N74-21630–N74-35363
NASA SP-7039(07)	N75-10001–N75-21218
NASA SP-7039(08)	N75-21219–N75-34001
NASA SP-7039(09)	N76-10001–N76-22149
NASA SP-7039(10)	N76-22150–N76-34122
NASA SP-7039(11)	N77-10001–N77-22041

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by Informatics Information Systems Company.

NASA SP-7039(11)
Section 1
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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 January 1977 and June 1977.

Scientific and Technical Information Office JULY 1977
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C.

This Supplement is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161, at price code E04 ($7.50 domestic; $15.00 foreign).

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 May 1969. Thus a complete set of *NASA PAB* would consist of the Abstract Section of Issue 04 (January 1974), the Abstract Section for all subsequent issues, and the Index Section for the most recent issue.

The 197 citations published in this issue of the Abstract Section cover the period January 1977 through June 1977. The Index Section contains references to the 3256 citations covering the period May 1969 through June 1977.

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

NASA ACCESSION NUMBER

TITLE

INVENTOR

NASA CASE NUMBER

ABSTRACT

AVAILABLE ON MICROFICHE

SOURCE

US PATENT APPLICATIONS SERIAL NUMBER

AVAILABILITY

COSATI CODE

KEY ILLUSTRATION

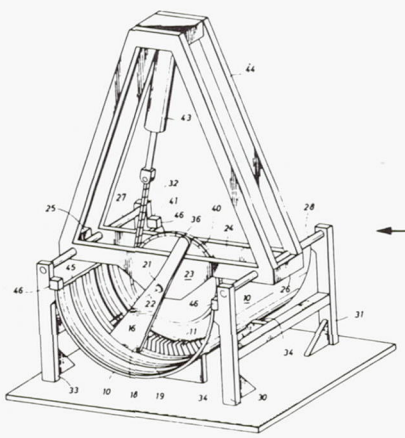
N77-13062*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

STATOR ROTOR TOOLS Patent Application

Donald D. Diamond, inventor (to NASA) (Serv-Air, Inc.) Filed 8 Nov. 1976 13 p Sponsored by NASA

(NASA-Case-MSC-16000-1; US-Patent-Appl-SN-739915) Avail: NTIS HC A02/MF A01 CSCL 21E

An apparatus and method for removing and reinserting base member segments in an arcuate slot was considered. It is in an engine part where each base member separately includes blades or stators comprising holding the engine part in place. It manipulates fingers on an arm into an interfitting abutting relationship with most of the blades on a base member and applies a torque force to the base of the blades to move a base member relative to such slot. NASA



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. For previous *NASA PAB* issues, the Table of Contents to Section 2 should be examined as the subject categories were changed beginning with *NASA PAB(07)*.

(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 Office 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 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. Prepaid purchase coupons for ordering are also available from the Patent Office.

NASA *patent application specifications* are sold in paper copy by the National Technical Information Service at price code A02 ($3.50 domestic; $7.00 foreign). Microfiche are sold at price code A01 ($3.00 domestic; $4.50 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, 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 Washington, D.C. 20546 Telephone: (202)755-3954
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301)982-2351
KSC-xxxxx XKS-xxxxx	John F. Kennedy Space Center Mail Code: AA-PAT Kennedy Space Center, Florida 32899 Telephone: (305)867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code: 456 Langley Station Hampton, Virginia 23365 Telephone: (804)827-3725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code: 500-311 21000 Brookpark Road Cleveland, Ohio 44135 Telephone: (216)433-6346
MSC-xxxxx XMS-xxxxx	Lyndon B. Johnson Space Center Mail Code: AM 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: 180-601 4800 Oak Grove Drive Pasadena, California 91103 Telephone: (213)354-2700

PATENT LICENSING REGULATIONS

Title 14—AERONAUTICS AND SPACE

Chapter V—National Aeronautics and Space Administration

PART 1245—PATENTS

Subpart 2—Patent Licensing Regulations

1. Subpart 2 is revised in its entirety as follows:

Sec.

AUTHORITY: The provisions of this Subpart 2 issued under 42 U.S.C. 2457, 2473(b)(3).

§ 1245.200 Scope of subpart.

This Subpart 2 prescribes the terms, conditions, and procedures for licensing inventions covered by U.S. patents and patent applications for which the Administrator of the National Aeronautics and Space Administration holds title on behalf of the United States.

§ 1245.201 Definitions.

For the purpose of this subpart, the following definitions apply:

(a) "Invention" means an invention covered by a U.S. patent or patent application for which the Administrator of NASA holds title on behalf of the United States and which is designated by the Administration as appropriate for the grant of license(s) in accordance with this subpart.

(b) "To practice an invention" means to make or have made, use or have used, sell or have sold, or otherwise dispose of according to law any machine, article of manufacture or composition of matter physically embodying the invention, or to use or have used the process or method comprising the invention.

(c) "Practical application" means the manufacture in the case of a composition of matter or product, the use in the case of a process, or the operation in the case of a machine, under such conditions as to establish that the invention is being utilized and that its benefits are reasonably accessible to the public.

(d) "Special invention" means any invention designated by the NASA Assistant General Counsel for Patent Matters to be subject to short-form licensing procedures. An invention may be designated as a special invention when a determination is made that:

(1) Practical application has occurred and is likely to continue for the life of the patent and for which an exclusive license is not in force, or

(2) The public interest would be served by the expeditious granting of a nonexclusive license for practice of the invention by the public.

(e) The "Administrator" means the Administrator of the National Aeronautics and Space Administration, or his designee.

(f) "Government" means the Government of the United States of America.

(g) The "Inventions and Contributions Board" means the NASA Inventions and Contributions Board established by the Administrator of NASA within the Administration in accordance with section 305 of the National Aeronautics and Space Act of 1958 as amended (42 U.S.C. 2457).

§ 1245.202 Basic considerations.

(a) Much of the new technology resulting from NASA sponsored research and development in aeronautical and space activities has application in other fields. NASA has special authority and responsibility under the National Aeronautics and Space Act of 1958, as amended (42 U.S.C. 2451), to provide for the widest practical dissemination and utilization of this new technology. In addition, NASA has been given unique requirements to protect the inventions resulting from NASA activities and to promulgate licensing regulations to encourage commercial use of these inventions.

(b) NASA-owned inventions will best serve the interests of the United States when they are brought to practical application in the shortest time possible. Although NASA encourages the nonexclusive licensing of its inventions to promote competition and achieve their widest possible utilization, the commercial development of certain inventions calls for a substantial capital investment which private manufacturers may be unwilling to risk under a nonexclusive license. It is the policy of NASA to seek exclusive licensees when such licenses will provide the necessary incentive to the licensee to achieve early practical application of the invention.

(c) The Administrator, in determining whether to grant an exclusive license, will evaluate all relevant information submitted by applicants and all other persons and will consider the necessity for further technical and market development of the invention, the capabilities of prospective licensees, their proposed plans to undertake the required investment and development, the impact on competitors, and the benefits of the license to the Government and to the public. Preference for exclusive license shall be given to U.S. citizens or companies who intend to manufacture or use, in the case of a process, the invention in the United States of America, its territories and possessions. Consideration may also be given to assisting small businesses and minority business enterprises, as well as economically depressed, low income and labor surplus areas.

(d) All licenses for inventions shall be by express written instruments. No license shall be granted either expressly or by implication, for a NASA invention except as provided for in §§ 1245.203 and 1245.204 and in any existing or future treaty or agreement between the United States and any foreign government.

(e) Licenses for inventions covered by NASA-owned foreign patents and patent applications shall be granted in accordance with the NASA Foreign Patent Licensing Regulations (§ 1245.4).

§ 1245.203 Licenses for practical application of inventions.

(a) *General.* As an incentive to encourage practical application of inventions, licenses will be granted to responsible applicants according to the circumstances and conditions set forth in this section.

(b) *Nonexclusive licenses.* (1) Each invention will be made available to responsible applicants for nonexclusive, revocable licensing in accordance with § 1245.206, consistent with the provisions of any existing exclusive license.

(2) The duration of the license shall be for a period as specified in the license.

(3) The license shall require the licensee to achieve the practical application of the invention and to then practice the invention for the duration of the license.

(4) The license may be granted for all or less than all fields of use of the invention and throughout the United States of America, its territories and possessions, Puerto Rico, and the District of Columbia, or in any lesser geographic portion thereof.

(5) The license shall extend to the subsidiaries and affiliates of the licensee and shall be nonassignable without approval of the Administrator, NASA, except to the successor of that part of the licensee's business to which the invention pertains.

(c) *Short-form nonexclusive licenses.* A nonexclusive, revocable license for a special invention, as defined in § 1245.201(d), shall be granted upon written request, to any applicant by the Patent Counsel of the NASA installation having cognizance of the invention.

(d) *Exclusive licenses.* (1) A limited exclusive license may be granted on an invention available for such licensing provided that:

(i) The Administrator has determined that: (*a*) The invention has not been brought to practical application by a nonexclusive licensee in the fields of use or in the geographical locations covered by the application for the exclusive license, (*b*) practical application of the invention in the fields of use or geographical locations covered by the application for the exclusive license is not likely to be achieved expeditiously by the further funding of the invention by the Government or under a nonexclusive license requested by any applicant pursuant to these regulations, and (*c*) the exclusive license will provide the necessary incentive to the licensee to achieve the practical application of the invention; and

(ii) Either a notice pursuant to

§ 1245.205 listing the invention as available for licensing has been published in the FEDERAL REGISTER for at least 9 months; or a patent covering the invention has been issued for at least 6 months. However, a limited exclusive license may be granted prior to the periods specified above if the Administrator determines that the public interest will best be served by the earlier grant of an exclusive license.

(2) The license may be granted for all or less than all fields of use of the invention, and throughout the United States of America, its territories and possessions, Puerto Rico, and the District of Columbia, or in any lesser geographic portion thereof.

(3) The exclusive period of the license shall be negotiated, but shall be for less than the terminal portion of the patent, and shall be related to the period necessary to provide a reasonable incentive to invest the necessary risk capital.

(4) The license shall require the licensee to practice the invention within a period specified in the license and then to achieve practical application of the invention.

(5) The license shall require the licensee to expend a specified minimum sum of money and/or to take other specified actions, within indicated period(s) after the effective date of the license, in an effort to achieve practical application of the invention.

(6) The license shall be subject to at least an irrevocable royalty-free right of the Government of the United States to practice and have practiced the invention throughout the world by or on behalf of the Government of the United States and on behalf of any foreign government pursuant to any existing or future treaty or agreement with the United States.

(7) The license may reserve to the Administrator, NASA, under the following circumstances, the right to require the granting of a sublicense to responsible applicant(s) on terms that are considered reasonable by the Administrator, taking into consideration the current royalty rates under similar patents and other pertinent facts: (i) To the extent that the invention is required for public use by Government regulation, or (ii) as may be necessary to fulfill health or safety needs, or (iii) for other purposes stipulated in the license.

(8) The license shall be nontransferable except to the successor of that part of the licensee's business to which the invention pertains.

(9) Subject to the approval of the Administrator, the licensee may grant sublicenses under the license. Each sublicense granted by an exclusive licensee shall make reference to and shall provide that the sublicense is subject to the terms of the exclusive license including the rights retained by the Government under the exclusive license. A copy of each sublicense shall be furnished to the Administrator.

(10) The license may be subject to such other reservations as may be in the public interest.

§ 1245.204 Other licenses.

(a) *License to contractor.* There is hereby granted to the contractor reporting an invention made in the performance of work under a contract of NASA in the manner specified in section 305(a)(1) or (2) of the National Aeronautics and Space Act of 1958 as amended (42 U.S.C. 2457(a)(1) or (2)), a revocable, nonexclusive, royalty-free license for the practice of such invention, together with the right to grant sublicenses of the same scope to the extent the contractor was legally obligated to do so at the time the contract was awarded. Such license and right is nontransferable except to the successor of that part of the contractor's business to which the invention pertains.

(b) *Miscellaneous licenses.* Subject to any outstanding licenses, nothing in this subpart 2 shall preclude the Administrator from granting other licenses for inventions, when he determines that do so would provide for an equitable distribution of rights. The following exemplify circumstances wherein such licenses may be granted:

(1) In consideration of the settlement of an interference;

(2) In consideration of a release of a claim of infringement; or

(3) In exchange for or as part of the consideration for a license under adversely held patent(s).

§ 1245.205 Publication of NASA inventions available for license.

(a) A notice will be perodically published in the FEDERAL REGISTER listing inventions available for licensing. Abstracts of the inventions will also be published in the NASA Scientific and Technical Aerospace Reports (STAR) and other NASA publications.

(b) Copies of pending patent applications for inventions abstracted in STAR may be purchased from the National Technical Information Service, Springfield, Va. 22151.

§ 1245.206 Application for nonexclusive license.

(a) *Submission of application.* An application for nonexclusive license under § 1245.203(b) or a short-form nonexclusive license for special inventions under § 1245.203(c) shall be addressed to the NASA Patent Counsel of the NASA installation having cognizance over the NASA invention for which a license is desired or to the NASA Assistant General Counsel for Patent Matters.

(b) *Contents of an application for nonexclusive license.* An application for nonexclusive license under § 1245.203(b) shall include:

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

(2) Name and address of the person, company or organization applying for license and whether the applicant is a U.S. citizen or a U.S. corporation;

(3) Name and address of representative of applicant to whom correspondence should be sent;

(4) Nature and type of applicant's business;

(5) Number of employees;

(6) Purpose for which license is desired;

(7) A statement that contains the applicant's best knowledge of the extent to which the invention is being practiced by private industry and the Government;

(8) A description of applicant's capability and plan to undertake the development and marketing required to achieve the practical application of the invention, including the geographical location where the applicant plans to manufacture or use, in the case of a process, the invention; and

(9) A statement indicating the minimum term of years the applicant desires to be licensed.

(c) *Contents of an application for a short-form nonexclusive license.* An application for a short-form nonexclusive license under § 1245.203(c) for a special invention shall include:

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

(2) Name and address of company or organization applying for license; and

(3) Name and address of representative of applicant to whom correspondence should be sent.

§ 1245.207 Application for exclusive license.

(a) *Submission of application.* An application for exclusive license under § 1245.203(d) may be submitted to NASA at any time. An application for exclusive license shall be addressed to the NASA Assistant General Counsel for Patent Matters.

(b) *Contents of an application for exclusive license.* In addition to the requirements set forth in § 1245.206(b), the application for an exclusive license shall include:

(1) Applicant's status, if any, in any one or more of the following categories:

(i) Small business firm;

(ii) Minority business enterprise;

(iii) Location in a surplus labor area;

(iv) Location in a low-income urban area; and

(v) Location in an area designed by the Government as economically depressed.

(2) A statement indicating the time, expenditure, and other acts which the applicant considers necessary to achieve practical application of the invention, and the applicant's offer to invest that sum and to perform such acts if the license is granted;

(3) A statement whether the applicant would be willing to accept a license for all or less than all fields of use of the invention throughout the United States of America, its territories and possessions, Puerto Rico, and the District of Columbia, or in any lesser geographic portion thereof.

(4) A statement indicating the amount of royalty fees or other consideration, if any, the applicant would be willing to pay the Government for the exclusive license; and

(5) Any other facts which the applicant believes to show it to be in the interests of the United States of America for the Administrator to grant an exclusive license rather than a nonexclusive li-

cense and that such an exclusive license should be granted to the applicant.

§ 1245.208 Processing applications for license.

(a) *Initial review.* Applications for nonexclusive and exclusive licenses under §§ 1245.206 and 1245.207 will be reviewed by the Patent Counsel of the NASA installation having cognizance for the invention and the NASA Assistant General Counsel for Patent Matters, to determine the conformity and appropriateness of the application for license and the availability of the specific invention for the license requested. The Assistant General Counsel for Patent Matters will forward all applications for license conforming to §§ 1245.206(b) and 1245.207(b) to the NASA Inventions and Contributions Board when the invention is available for consideration of the requested license. Prior to forwarding applications for exclusive licenses to the Inventions and Contributions Board, notice in writing will be given to each nonexclusive licensee for the specific invention advising of the receipt of the application for the exclusive license and providing each nonexclusive licensee with a 30-day period for submitting either evidence that practical application of the invention has occurred or is about to occur or, an application for an exclusive license for the invention.

(b) *Recommendations of Inventions and Contributions Board.* The Inventions and Contributions Board shall, in accordance with the basic considerations set forth in §§ 1245.202 and 1245.203, evaluate all applications for license forwarded by the Assistant General Counsel for Patent Matters. Based upon the facts presented to the Inventions and Contributions Board in the application and any other facts in its possession, the Inventions and Contributions Board shall recommend to the Administrator: (1) Whether a nonexclusive or exclusive license should be granted, (2) the identity of the licensee, and (3) any special terms or conditions of the license.

(c) *Determination of Administrator and grant of nonexclusive licenses.* The Administrator shall review the recommendations of the Inventions and Contributions Board and shall determine whether to grant the nonexclusive license as recommended by the Board. If the Administrator determines to grant the license, the license will be granted upon the negotiation of the appropriate terms and conditions of the Office of General Counsel.

(d) *Determination of Administrator and grant of exclusive licenses*—(1) *Notice.* If the Administrator determines that the best interest of the United States will be served by the granting of an exclusive license in accordance with the basic considerations set forth in §§ 1245.202 and 1245.203, a notice shall be published in the FEDERAL REGISTER announcing the intent to grant the exclusive license, the identification of the invention, special terms or conditions of the proposed license, and a statement that NASA will grant the exclusive license unless within 30 days of the publication of such notice the Inventions and Contributions Board receives in writing any of the following together with supporting documentation:

(i) A statement from any person setting forth reasons why it would not be in the best interest of the United States to grant the proposed exclusive license; or

(ii) An application for a nonexclusive license under such invention, in accordance with § 1245.206(b), in which applicant states that he has already brought or is likely to bring the invention to practical application within a reasonable period.

The Inventions and Contributions Board shall, upon receipt of a written request within the 30 days' notice period, grant an extension of 30 days for the submission of the documents designated above.

(2) *Recommendation of Inventions and Contributions Board.* Upon the expiration of the period required by subparagraph (1) of this paragraph, the Board shall review all written responses to the notice and shall then recommend to the Administrator whether to grant the exclusive license as the Board initially recommended or whether a different form of license, if any, should instead be granted.

(3) *Grant of exclusive licenses.* The Administrator shall review the Board's recommendation and shall determine if the interest of the United States would best be served by the grant of an exclusive license as recommended by the Board. If the Administrator determines to grant the exclusive license, the license will be granted upon the negotiation of the appropriate terms and conditions by the Office of General Counsel.

§ 1245.209 Royalties and fees.

(a) Normally, a nonexclusive license for the practical application of an invention granted to a U.S. citizen or company will not require the payment of royalties; however, NASA may require other consideration.

(b) An exclusive license for an invention may require the payment of royalties, fees or other consideration when the licensing circumstances and the basic considerations in § 1245.202, considered together, indicate that it is in the public interest to do so.

§ 1245.210 Reports.

A license shall require the licensee to submit periodic reports of his efforts to work the invention. The reports shall contain information within his knowledge, or which he may acquire under normal business practice, pertaining to the commercial use that is being made of the invention and such other information which the Administrator may determine pertinent to the licensing program and which is specified in the license.

§ 1245.211 Revocation of licenses.

(a) Any license granted pursuant to § 1245.203 may be revoked, either in part or in its entirety, by the Administrator if in his opinion the licensee at any time shall fail to use adequate efforts to bring to or achieve practical application of the invention in accordance with the terms of the license, or if the licensee at any time shall default in making any report required by the license, or shall make any false report, or shall commit any breach of any covenant or agreement therein contained, and shall fail to remedy any such default, false report, or breach within 30 days after written notice, or if the patent is deemed unenforceable either by the Attorney General or a final decision of a U.S. court.

(b) Any license granted pursuant to § 1245.204(a) may be revoked, either in part or in its entirety, by the Administrator if in his opinion such revocation is necessary to achieve the earliest practical application of the invention pursuant to an application for exclusive license submitted in accordance with § 1245.207, or the licensee at any time shall breach any covenant or agreement contained in the license, and shall fail to remedy any such breach within 30 days after written notice thereof.

(c) Before revoking any license granted pursuant to this Subpart 2 for any cause, there will be furnished to the licensee a written notice of intention to revoke the license, and the licensee will be allowed 30 days after such notice in which to appeal and request a hearing before the Inventions and Contributions Board on the question of revocation. After a hearing, the Inventions and Contributions Board shall transmit to the Administrator the record of proceedings, its findings of fact, and its recommendation whether the license should be revoked either in part or in its entirety. The Administrator shall review the recommendation of the Board and determine whether to revoke the license in part or in its entirety. Revocation of a license shall include revocation of all sublicenses which have been granted.

§ 1245.212 Appeals.

Any person desiring to file an appeal pursuant to § 1245.211(c) shall address the appeal to Chairman, Inventions and Contributions Board. Any person filing an appeal shall be afforded an opportunity to be heard before the Inventions and Contributions Board, and to offer evidence in support of his appeal. The procedures to be followed in any such matter shall be determined by the Administrator. The Board shall make findings of fact and recommendations with respect to disposition of the appeal. The decision on the appeal shall be made by the Administrator, and such decision shall be final and conclusive, except on questions of law, unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence.

§ 1245.213 Litigation.

An exclusive licensee shall be granted the right to sue at his own expense any party who infringes the rights set forth in his license and covered by the licensed patent. The licensee may join the Government, upon consent of the Attorney General, as a party complainant in such suit, but without expense to the Government and the licensee shall pay costs and any final judgment or decree that may be rendered against the Govern-

ment in such suit. The Government shall also have an absolute right to intervene in any such suit at its own expense. The licensee shall be obligated to promptly furnish to the Government, upon request, copies of all pleadings and other papers filed in any such suit and of evidence adduced in proceedings relating to the licensed patent including, but not limited to, negotiations for settlement and agreements settling claims by a licensee based on the licensed patent, and all other books, documents, papers, and records pertaining to such suit. If, as a result of any such litigation, the patent shall be declared invalid, the licensee shall have the right to surrender his license and be relieved from any further obligation thereunder.

§ 1245.214 Address of Communications.

(a) Communications to the Assistant General Counsel for Patent Matters in accordance with §§ 1245.206 and 1245.207 and requests for information concerning licenses for NASA inventions should be addressed to the Assistant General Counsel for Patent Matters, Code GP, National Aeronautics and Space Administration, Washington, D.C. 20546.

(b) Communications to the Inventions and Contributions Board in accordance with §§ 1245.208, 1245.211, and 1245.212 should be addressed to Chairman, Inventions and Contributions Board, National Aeronautics and Space Administration, Washington, D.C. 20546.

Effective date. The regulations set forth in this subpart 2 are effective April 1, 1972.

JAMES C. FLETCHER,
Administrator.

FOREIGN PATENT LICENSING REGULATIONS

Selected NASA inventions are also available for licensing in countries other than the United States in accordance with the NASA Foreign Patent Licensing Regulation (14 C.F.R. 1245.4), a copy of which is available from any NASA Patent Counsel.

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 life 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*.

71 ACOUSTICS **N.A.**

Includes sound generation, transmission, and attenuation.

For noise pollution see *45 Environment Pollution.*

72 ATOMIC AND MOLECULAR PHYSICS **N.A.**

Includes atomic structure and molecular spectra.

73 NUCLEAR AND HIGH-ENERGY PHYSICS **60**

Includes elementary and nuclear particles; and reactor theory.

For space radiation see *93 Space Radiation.*

74 OPTICS **60**

Includes light phenomena.

75 PLASMA PHYSICS **N.A.**

Includes magnetohydrodynamics and plasma fusion.

For ionospheric plasmas see *46 Geophysics.* For space plasmas see *90 Astrophysics.*

76 SOLID-STATE PHYSICS **N.A.**

Includes superconductivity.

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

77 THERMODYNAMICS AND STATISTICAL PHYSICS **N.A.**

Includes quantum mechanics; and Bose and Fermi statistics.

For related information see also *25 Inorganic and Physical Chemistry* and *34 Fluid Mechanics and Heat Transfer.*

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.

80 SOCIAL SCIENCES (GENERAL) **N.A.**

Includes educational matters.

81 ADMINISTRATION AND MANAGEMENT **N.A.**

Includes management planning and research.

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

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

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

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

Includes cost effectiveness studies.

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

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

85 URBAN TECHNOLOGY AND TRANSPORTATION **62**

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

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

SPACE SCIENCES

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

For related information see also *Geosciences.*

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

89 ASTRONOMY **N.A.**

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

90 ASTROPHYSICS **N.A.**

Includes cosmology; and interstellar and interplanetary gases and dust.

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

Includes planetology; and manned and unmanned flights.

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

92 SOLAR PHYSICS **N.A.**

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

93 SPACE RADIATION **N.A.**

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

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

GENERAL

99 GENERAL **N.A.**

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

Section 2 • Indexes

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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.*

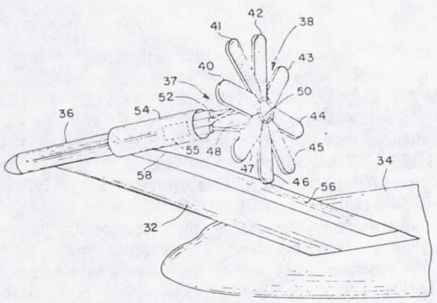
N77-10001* National Aeronautics and Space Administration. *Langley Research Center, Langley Station, Va.*

WINGTIP VORTEX DISSIPATOR FOR AIRCRAFT Patent

James C. Patterson, Jr., inventor (to NASA) Issued 5 Oct. 1976 6 p Filed 28 May 1974 Supersedes N74-26456 (12 - 16, p 1855)

(NASA-Case-LAR-11645-1; US-Patent-3,984,070; US-Patent-Appl-SN-473973; US-Patent-Class-244-130; US-Patent-Class-244-113) Avail: US Patent Office CSCL 01A

A means for attenuating the vortex created at aircraft wingtips which consists of a retractable planar surface transverse to the airstream and attached downstream of the wingtip which creates a positive pressure gradient just downstream from the wing is presented. The positive pressure forces a break up of the rotational air flow of the vortex. Official Gazette of the U.S. Patent Office



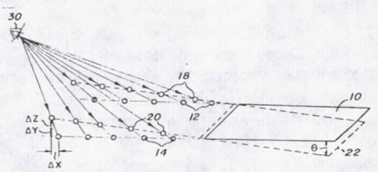
N77-12031*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SPECTRALLY BALANCED CHROMATIC LANDING APPROACH LIGHTING SYSTEM Patent Application

Wendell D. Chase, inventor (to NASA) Filed 10 Dec. 1976 21 p

(NASA-Case-ARC-10990-1; US-Patent-Appl-SN-749420) Avail: NTIS HC A02/MF A01 CSCL 17G

A landing approach lighting system which corrects for the effects of chromatic aberration of the human eye to help prevent a pilot from making misjudgments leading to landings short of a runway threshold is described. The system utilizes red warning lights to delineate the runway approach with additional blue lights juxtaposed with the red lights such that the red lights are chromatically balanced. The red/blue point light sources result in the phenomenon that the red lights appear in front of the blue lights with about one and one-half times the diameter of the blue. To a pilot observing these lights along a glide path, those red lights directly below appear to be nearer than the blue lights. For those lights farther away seen in perspective at oblique angles, the red lights appear to be in a position closer to the pilot and hence appear to be above the corresponding blue lights. 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.*

N77-19056* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

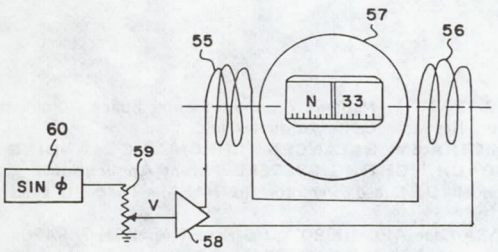
MAGNETIC HEADING REFERENCE Patent

Howell D. Garner, inventor (to NASA) Issued 8 Feb. 1977 12 p Filed 16 Oct. 1975 Supersedes N76-26180 (14-17, p 2152) Division of US Patent Appl. SN-531647, filed 11 Dec. 1974, US Patent-3,943,763

(NASA-Case-LAR-11387-2; US-Patent-4,006,631; US-Patent-Appl-SN-623156; US-Patent-Class-73-178R; US-Patent-Class-33-356; US-Patent-Appl-SN-531647; US-Patent-3,943,763) Avail: US Patent Office CSCL 17G

This invention employs a magnetometer as a magnetic heading reference for a vehicle such as a small aircraft. The magnetometer

is mounted on a directional dial in the aircraft in the vicinity of the pilot such that it is free to turn with the dial about the yaw axis of the aircraft. The invention includes a circuit for generating a signal proportional to the northerly turning error produced in the magnetometer due to the vertical component of the earth's magnetic field. This generated signal is then subtracted from the output of the magnetometer to compensate for the northerly turning error. Official Gazette of the U.S. Patent Office



05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes aircraft simulation technology.

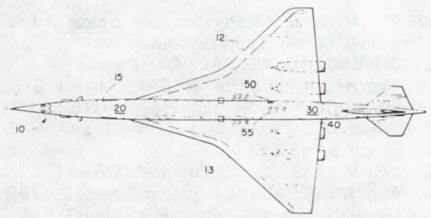
For related information see also *18 Spacecraft Design, Testing and Performance* and *39 Structural Mechanics*.

N77-15027*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

AIRCRAFT DESIGN CONCEPT Patent Application

Frank D. Neuman (Boeing Co., Seattle), Gottfried O. Friebel (Boeing Co., Seattle), and Armand Sigalla, inventors (to NASA) (Boeing Co., Seattle) Filed 15 Nov. 1976 10 p Sponsored by NASA (NASA-Case-LAR-11852-1; US-Patent-Appl-SN-742035) Avail: NTIS HC A02/MF A01 CSCL 01C

The passenger cabin in commercial aircraft is divided into forward and aft compartments allowing the wing carry-through structure to occupy space ordinarily reserved for passengers. Benefits are a stronger, smaller, more weight-efficient wing structure, larger fuselage fineness ratio, reduced weight and drag and increased fuel economy. NASA



N77-17029* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

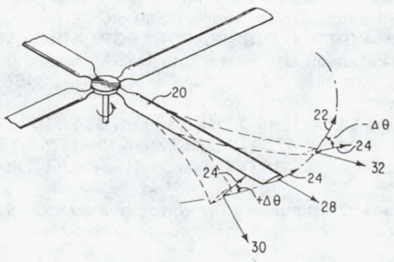
HINGELESS HELICOPTER ROTOR WITH IMPROVED STABILITY Patent

Robert A. Ormiston, William G. Bousman, Dewey H. Hodges, and David A. Peters, inventors (to NASA) Issued 28 Dec. 1976 11 p Filed 10 Oct. 1974 Supersedes N74-34475 (12 - 24, p 2899)

(NASA-Case-ARC-10807-1; US-Patent-3,999,886; US-Patent-Appl-SN-513612; US-Patent-Class-416-104; US-Patent-Class-416-141; US-Patent-Class-416-138) Avail: US Patent Office CSCL 01C

Improved stability was provided in a hingeless helicopter rotor by inclining the principal elastic flexural axes and coupling pitching of the rotor blade with the lead-lag bending of the blade. The primary elastic flex axes were inclined by constructing the blade of materials that display non-uniform stiffness, and the specification described various cross section distributions and the resulting inclined flex axes. Arrangements for varying the pitch of the rotor blade in a predetermined relationship with lead-lag bending of the blade, i.e., bending of the blade in a plane parallel to its plane of rotation were constructed.

Official Gazette of the U.S. Patent Office

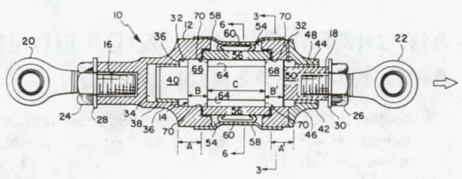


N77-18134*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

AUTOMATICALLY LOCKABLE AXIALLY EXTENSIBLE STRUT Patent Application

Frank Bonisch, inventor (to NASA) (Silcorsky Aircraft) Filed 7 Mar. 1977 13 p Sponsored by NASA (NASA-Case-LAR-11900-1; US-Patent-Appl-SN-775239) Avail: NTIS HC A02/MF A01 CSCL 01C

This invention relates to a low friction, axially extensible secondary struct link between a helicopter main rotor force measurement system and the helicopter frame which is automatically lockable and capable of transmitting both tension and compression loads to the helicopter frame in the event of primary link failure. 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*.

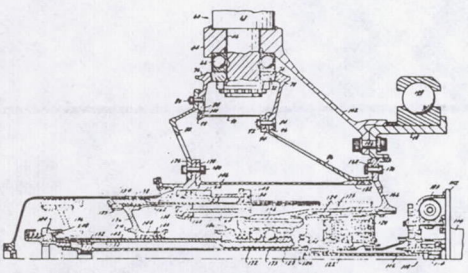
N77-14025* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

DUAL OUTPUT VARIABLE PITCH TURBOFAN ACTUATION SYSTEM Patent

Robert H. Griswold, Jr. (GE, Cincinnati) and Carl L. Broman, inventors (to NASA) (GE, Cincinnati) Issued 30 Nov. 1976 10 p Filed 21 May 1975 Sponsored by NASA (NASA-Case-LEW-12419-1; US-Patent-3,994,128; US-Patent-Appl-SN-579375; US-Patent-Class-60-226R; US-Patent-Class-416-160; US-Patent-Class-416-162; US-Patent-Class-416-165; US-Patent-Class-416-167; US-Patent-Class-416-153) Avail: US Patent Office CSCL 21E

An improved actuating mechanism was provided for a gas turbine engine incorporating fan blades of the variable pitch variety, the actuator adapted to rotate the individual fan blades within apertures in an associated fan disc. The actuator included means such as a pair of synchronizing ring gears, one on each side of the blade shanks, and adapted to engage pinions disposed thereon. Means were provided to impart rotation to the ring gears in opposite directions to effect rotation of the blade shanks in response to a predetermined input signal. In the event of system failure, a run-away actuator was prevented by an improved braking device which arrests the mechanism.

Official Gazette of the U.S. Patent Office



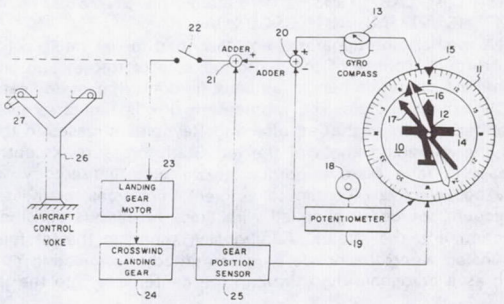
N77-20098*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

CROSSWIND LANDING GEAR POSITION INDICATOR Patent Application

Robert A. Champine, inventor (to NASA) Filed 23 Mar. 1977 8 p (NASA-Case-LAR-11941-1; US-Patent-Appl-SN-780568) Avail: NTIS HC A02/MF A01 CSCL 01D

An instrument for use on an aircraft equipped with a cross wind landing gear system is described. The instrument indicates on the pilot's display panel of the aircraft the alinement or misalinement of the wheels of the aircraft relative to the runway and to the aircraft's centerline in a manner such that the flight crew will not mistakenly adjust the wheels in the wrong direction. The wheels have automatic and manual modes of operation. In the automatic mode of operation, the wheels are automatically alined with the runway, and the alinement is indicated on the display panel of the aircraft. In the manual mode of operation the pilot turns the wheels to aline them with the runway. The alinement or misalinement of the wheels is indicated on the display panel.

NASA



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*.

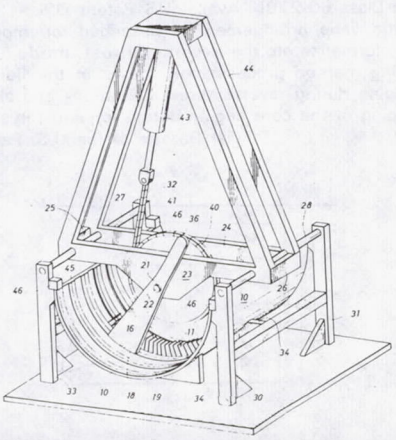
N77-13062*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

STATOR ROTOR TOOLS Patent Application

Donald D. Diamond, inventor (to NASA) (Serv-Air, Inc.) Filed 8 Nov. 1976 13 p Sponsored by NASA (NASA-Case-MSC-16000-1; US-Patent-Appl-SN-739915) Avail: NTIS HC A02/MF A01 CSCL 21E

An apparatus and method for removing and reinserting base member segments in an arcuate slot was considered. It is in an engine part where each base member separately includes blades or stators comprising holding the engine part in place. It manipulates fingers on an arm into an interfitting abutting relationship with most of the blades on a base member and applies a torque force to the base of the blades to move a base member relative to such slot.

NASA



07 AIRCRAFT PROPULSION AND POWER

N77-15036*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

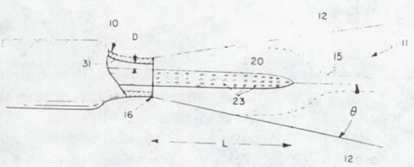
APPARATUS AND METHOD FOR JET NOISE SUPPRESSION Patent Application

Lucio Mestrello, inventor (to NASA) Filed 23 Dec. 1976 17 p

(NASA-Case-LAR-11903-1; US-Patent-Appl-SN-753971) Avail: NTIS HC A02/MF A01 CSCL 20A

A method and apparatus are described for jet noise suppression through control of the static pressure of the jet and control of the rate of entrainment of ambient fluid into the jet downstream of the exhaust nozzle. The momentum flux is regulated over an extended region of the jet, affecting Reynolds stresses in the jet and the spreading angle of the jet. Static pressure is controlled through a long hollow, porous nozzle plug centerbody which may be selectively vented to ambient conditions, connected to a vacuum source, or supplied with fluids of various densities for injection into the stream. Additionally, sound in the jet may be channeled along the nozzle plug centerbody by injecting coolant such as a cryogenic fluid through the centerbody into the jet.

NASA



N77-17059* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

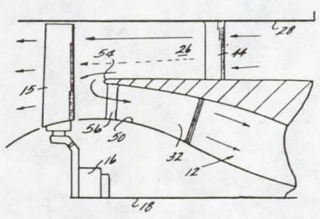
REVERSE PITCH FAN WITH DIVIDED SPLITTER Patent

Leroy H. Smith, Jr., inventor (to NASA) (GE, Cincinnati, Ohio) Issued 1 Feb. 1977 6 p Filed 21 Apr. 1975 Sponsored by NASA

(NASA-Case-LEW-12760-1; US-Patent-4,005,574; US-Patent-Appl-SN-569925; US-Patent-Class-60-226A; US-Patent-Class-60-228) Avail: US Patent Office CSCL 21E

A guide vane arrangement is described for improving gas turbine performance in the reverse thrust mode. This flow straightening method produces low losses in the fluid entering a core engine during reverse thrust operations and allows large supercharging of the core engine during forward thrust.

Official Gazette of the U.S. Patent Office



N77-18154* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

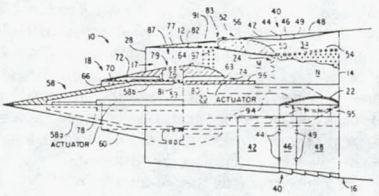
THE ENGINE AIR INTAKE SYSTEM Patent

Norman E. Sorensen and Eldon A. Latham, inventors (to NASA) Issued 15 Feb. 1977 9 p Filed 12 Sep. 1975 Supersedes N75-31108 (13 - 22, p 2747)

(NASA-Case-ARC-10761-1; US-Patent-4,007,891; US-Patent-Appl-SN-612899; US-Patent-Class-244-53B; US-Patent-Class-137-15.1) Avail: US Patent Office CSCL 21E

An axisymmetric air intake system for a jet aircraft engine comprising a fixed cowl extending outwardly from the face of the engine, a centerbody coaxially disposed within the cowl, and an actuator for axially displacing the centerbody within the cowl was developed. The cowl and centerbody define a main airflow passageway therebetween, the configuration of which is changed by displacement of the centerbody. The centerbody includes a forwardly-located closeable air inlet which communicates with a centerbody auxiliary airflow passageway to provide auxiliary airflow to the engine. In one embodiment, a system for opening and closing the centerbody air inlet is provided by a dual-member centerbody, the forward member of which may be displaced axially with respect to the aft member.

Official Gazette of the U.S. Patent Office



N77-18160*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

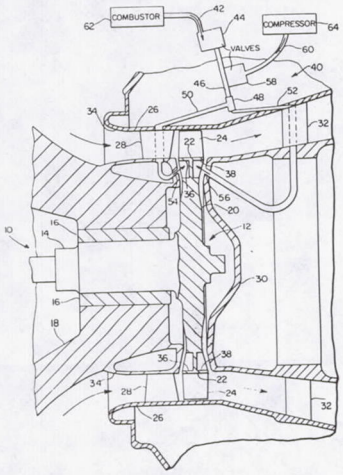
APPARATUS AND METHOD FOR REDUCING THERMAL STRESS IN A TURBINE ROTOR Patent Application

J. A. Heller, inventor (to NASA) Filed 4 Mar. 1977 13 p

(NASA-Case-LEW-12232-1; US-Patent-Appl-SN-776029) Avail: NTIS HC A02/MF A01 CSCL 21E

A gas turbine is provided wherein the thermal stresses in the turbine rotor are reduced. The rotor includes a central disc with a peripheral rim, and a plurality of blades extending radially outwardly from the rim, and to reduce thermal stresses, a duct arrangement is provided which selectively directs hot gases from the turbine combustor to the rim during the turbine start-up. The hot gases from the combustor serve to heat the rim, and thus decrease the start-up period necessary to bring the temperature profile of the rotor into the operating temperature range. After the start-up period, the duct arrangement is then used to direct cool gases from the turbine compressor to the

rim of the rotor in order to maintain a lower rotor equilibrium temperature. 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.

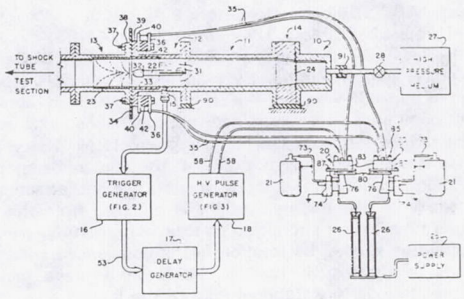
For related information see also *14 Ground Support Systems and Facilities (Space).*

N77-10071* National Aeronautics and Space Administration. Pasadena Office, Calif.

ANNULAR ARC ACCELERATOR SHOCK TUBE Patent

Lewis P. Leibowitz, inventor (to NASA) (JPL) Issued 5 Oct. 1976 9 p Filed 6 Nov. 1974 Supersedes N75-11997 (13 - 03, p 0261) Published under the second Trial Voluntary Protest Program as B521,620, 27 Jan. 1976 Sponsored by NASA (NASA-Case-NPO-13528-1; US-Patent-3,983,749; US-Patent-Appl-SN-521620; US-Patent-Class-73-147) Avail: US Patent Office CSCL 14B

An annular arc accelerator shock tube employs a cold gas driver to flow a stream of gas from an expansion section through a high voltage electrode section to a test section, thus driving a shock wave in front of it. A glow discharge detects the shock wave and actuates a trigger generator which in turn fires spark-gap switches to discharge a bank of capacitors across a centered cathode and an annular anode in tandem electrode sections. The initial shock wave passes through the anode section from the cathode section thereby depositing energy into the flow gas without the necessity of any diaphragm opening in the gas flow from the expansion section through the electrode sections. Official Gazette of the U.S. Patent Office

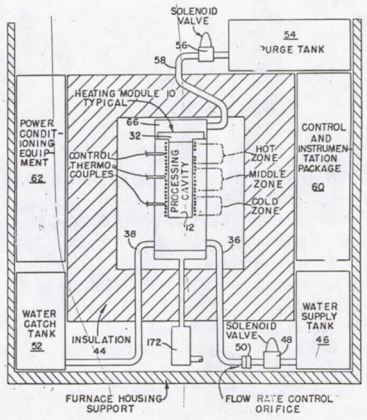


N77-12070*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

GENERAL PURPOSE ROCKET FURNACE Patent Application

Billy R. Aldrich and William D. Whitt, inventors (to NASA) Filed 30 Nov. 1976 35 p (NASA-Case-MFS-23460-1; US-Patent-Appl-SN-746578) Avail: NTIS HC A03/MF A01 CSCL 14B

A multi-purpose furnace for space vehicles used for material processing experiments in an outer space environment. The furnace contains three separate cavities designed to process samples of the widest possible range of materials and thermal requirements. Each cavity contains three heating elements capable of independent function under the direction of an automatic and programmable control system. A heat removable mechanism is also provided for each cavity which operates in conjunction with the control system for establishing an isothermally heated cavity or a wide range of thermal gradients and cool down rates. A monitoring system compatible with the rocket telemetry provides furnace performance and sample growth rate data throughout the processing cycle. NASA



09 RESEARCH AND SUPPORT FACILITIES (AIR)

N77-19076* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

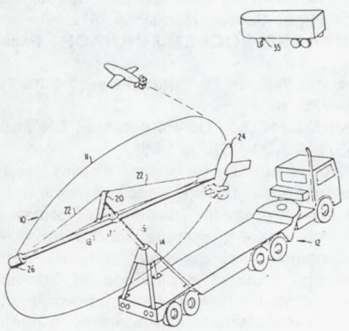
ROTATING LAUNCH DEVICE FOR A REMOTELY PILOTED AIRCRAFT Patent

Thomas J. Gregory, inventor (to NASA) Issued 2 Nov. 1976 6 p Filed 28 Aug. 1975

(NASA-Case-ARC-10979-1; US-Patent-3,989,206; US-Patent-Appl-SN-608483; US-Patent-Class-244-63; US-Patent-Class-124-6) Avail: US Patent Office CSCL 01E

A method and apparatus for launching a remotely piloted aircraft is disclosed, wherein the aircraft is revolved about a fixed pivot point until a predetermined speed is reached whereupon the vehicle is released from the launching apparatus. The vehicle is attached to one end of a rotatable arm, the imbalance on the arm being counteracted by a counter weight attached to the opposite end. The counter weight is released from the arm at the same time as the aircraft so as to avoid structural damage to the apparatus caused by rotation in the unbalanced condition. The arm is oriented such that it rotates in a plane inclined obliquely to the local gravitational field of the launch site.

Official Gazette of the U.S. Patent Office



N77-19077*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

MULTI-PURPOSE WIND TUNNEL REACTION CONTROL MODEL BLOCK Patent Application

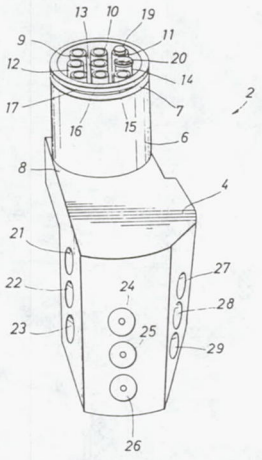
Henry S. Dresser (Rockwell Intern. Corp, Downey, Calif.) and Joseph J. Daileda, inventors (to NASA) (Rockwell Intern. Corp., Downey, Calif.) Filed 11 Feb. 1977 14 p

(Contract NAS9-14000)

(NASA-Case-MSC-19706-1; US-Patent-Appl-SN-767911) Avail: NTIS HC A02/MF A01 CSCL 14B

A reaction control system nozzle block is provided for testing the response characteristics of space vehicles to a variety of reaction control thruster configurations. A pressurized air system is connected with the supply lines which lead to the individual jet nozzles. Each supply line terminates in a compact cylindrical plenum volume, axially perpendicular and adjacent to the throat of the jet nozzle. The volume of the cylindrical plenum is sized to provide uniform thrust characteristics from each jet nozzle irrespective of the angle of approach of the supply line to the plenum.

NASA



13 ASTRODYNAMICS

Includes powered and free-flight trajectories; and orbit and launching dynamics.

N77-11079*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

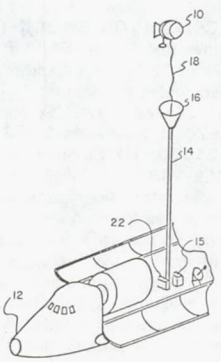
TETHERLINE SYSTEM FOR ORBITING SATELLITES Patent Application

Charles C. Rupp and Ralph R. Kissel, inventors (to NASA) Filed 8 Nov. 1976 11 p

(NASA-Case-MFS-23564-1; US-Patent-Appl-SN-739908) Avail: NTIS HC A02/MF A01 CSCL 22A

A system for tethering one orbiting space vehicle to another in which a tetherline between the vehicles is controlled by a motorized reel is discussed. The reel is controlled to deploy, retrieve, or maintain a constant line length while effecting a stabilizing influence on the line. This is accomplished by applying a tension to the line which takes into account the instantaneous length of the line, rate of change of the length of the line, and certain constants which vary depending upon the mode of operation, deployment, retrieval, or station keeping.

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)*.

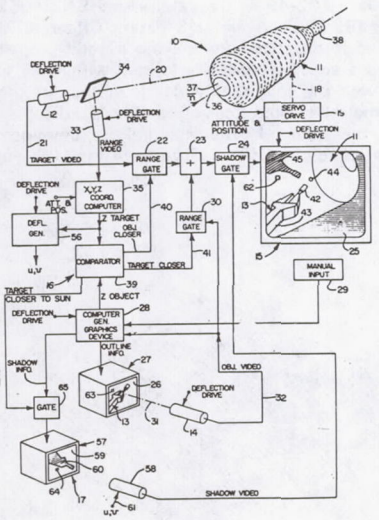
N77-18179*# *National Aeronautics and Space Administration.* Marshall Space Flight Center, Huntsville, Ala.

SIMULATOR FOR PRACTICING THE MATING OF AN OBSERVER-CONTROLLED OBJECT WITH A TARGET Patent Application

Walter J. Polstorff, inventor (to NASA) Filed 25 Feb. 1977 25 p

(NASA-Case-MFS-23052-2; US-Patent-Appl-SN-772165) Avail: NTIS HC A02/MF A01 CSCL 14B

A servo controlled target replica, and a surface bearing a computer generated line drawing of an object are individually viewed by separate television cameras. This allowed a two-dimensional composite of the target replica and the object to be displayed on a monitor simulating what an observer would see through a window in a spacecraft. The target replica is coded along one self coordinate axis in such a way that the distance of an elemental area on the target along the axis is capable of being remotely readout by a television camera. The code is by way of a variation in color (i.e., wavelength) or in brightness (or a combination of color or brightness). NASA



15 LAUNCH VEHICLES AND SPACE VEHICLES

Includes boosters; manned orbital laboratories; reusable vehicles; and space stations.

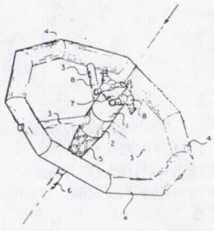
N77-10112* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

MULTIPLE IN-LINE DOCKING CAPABILITY FOR ROTATING SPACE STATIONS Patent

Leon B. Weaver and Claude D. Pegden, inventors (to NASA) Issued 10 Jul. 1973 8 p Filed 12 Apr. 1972 Supersedes N72-25853 (10 - 16, p 2213)

(NASA-Case-MFS-20855-1; US-Patent-3,744,739; US-Patent-Appl-SN-243374; US-Patent-Class-244-1SD) Avail: US Patent Office CSCL 22B

The invention comprises means for hard docking a number of space vehicles with a rotating space station, and includes an axially positioned dome on which are located two intermeshing docking turrets. Each turret carries multiple docking ports extending radially from the turret axis, along which axis final access to the space station is accomplished through the turret hub. The turrets intermesh and rotate about their hubs, by means of a power source and suitable ring gears and bevel pinions, to successively position one of the docking ports on the axis of rotation of the space station, while the remaining ports are positioned off center, and alternately rotated into such docking position to receive an additional space craft. The arrangement allows docking in-line with the axis of rotation of the station, and multiple vehicles to be thus docked and then placed in holding position. Official Gazette of the U.S. Patent Office



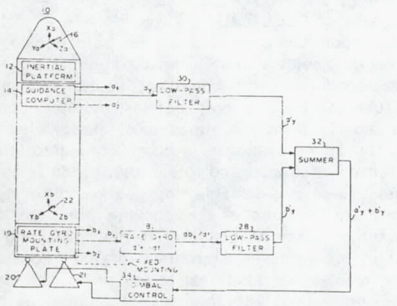
N77-10113* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

ATTITUDE CONTROL SYSTEM Patent

George L. vonPragenau and Charles C. Rupp, inventors (to NASA) Issued 5 Oct. 1976 5 p Filed 2 Oct. 1974 Supersedes N74-35096 (12 - 24, p 2977) Published under the second Trial Voluntary Protest Program as B 511,346, 27 Jan. 1976 (NASA-Case-MFS-22787-1; US-Patent-3,984,072; US-Patent-Appl-SN-511346; US-Patent-Class-244-169; US-Patent-Class-244-3.21; US-Patent-Class-244-171) Avail: US Patent Office CSCL 22B

An attitude control system is described in which angular rate signals are generated by rate gyros mounted closely adjacent to gimbaled engines at the rear of a vehicle. Error signals representative of a commanded change in vehicle angle or attitude are obtained from a precision inertial platform located in the nose region of the vehicle. The rate gyro derived signals dominate at high frequencies where dynamic effects become significant, and platform signals dominate at low frequencies where precision signals are required for a steady vehicle attitude. The blended signals are applied in a conventional manner to control the gimbaling of vehicle engines about control axes.

Official Gazette of the U.S. Patent Office



20 SPACECRAFT PROPULSION AND POWER

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

For related information see also *07 Aircraft Propulsion, 28 Propellants and Fuels,* and *44 Energy Production and Conversion.*

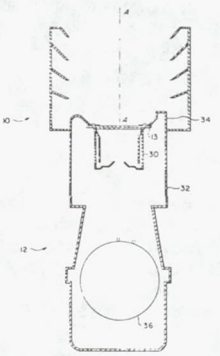
N77-10148* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ION BEAM THRUSTER SHIELD Patent

John L. Power, inventor (to NASA) Issued 5 Oct. 1976 8 p Filed 12 Sep. 1975 Supersedes N75-32166 (13 - 23, p 2885) (NASA-Case-LEW-12082-1; US-Patent-3,983,695; US-Patent-Appl-SN-612964; US-Patent-Class-60-202; US-Patent-Class-313-361; US-Patent-Class-313-231.4; US-Patent-Class-313-240; US-Patent-Class-315-111.3) Avail: US Patent Office CSCL 21C

An ion thruster beam shield is provided that comprises a cylindrical housing that extends downstream from the ion thruster and a plurality of annular vanes which are spaced along the length of the housing, and extend inwardly from the interior wall of the housing. The shield intercepts and stops all charge exchange and beam ions, neutral propellant, and sputter products formed due to the interaction of beam and shield emanating from the ion thruster outside of a fixed conical angle from the thruster axis. Further, the shield prevents the sputter products formed during the operation of the engine from escaping the interior volume of the shield.

Official Gazette of the U.S. Patent Office

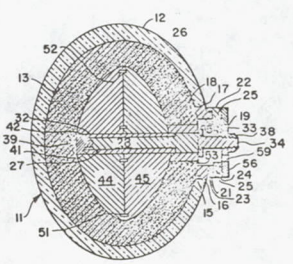


N77-17143* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

SOLID PROPELLANT ROCKET MOTOR AND METHOD OF MAKING SAME Patent

Joseph G. Thibodaux, Jr. and Donald J. Lewis, inventors (to NASA) Issued 4 Jan. 1977 6 p Filed 16 Jan. 1963 Division of US Patent Appl. SN-54552, filed 7 Sep. 1960, US-Patent-3,193,883 (NASA-Case-XLA-1349; US-Patent-4,000,682; US-Patent-Appl-SN-256493; US-Patent-Class-86-1R; US-Patent-Class-86-20R; US-Patent-Class-264-3R; US-Patent-Class-102-49.3; US-Patent-Appl-SN-54552; US-Patent-3,193,883) Avail: US Patent Office CSCL 21H

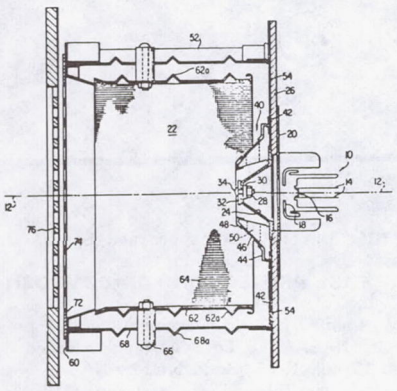
A method is described for making a solid propellant rocket motor having a specific concavity formed within the fuel charge. A mandrel with an aperature wider than that of the casing is inserted within the motor casing and a solidifiable propellant cast above the mandrel. The mandrel is removed after the propellant is cured. Official Gazette of the U.S. Patent Office



N77-20162* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ANODE FOR ION THRUSTER Patent
Bruce A. Banks, inventor (to NASA) Issued 15 Mar. 1977 4 p Filed 8 Mar. 1976 Supersedes N76-19227 (14 - 10, p 1228)
(NASA-Case-LEW-12048-1; US-Patent-4,011,719; US-Patent-Appl-SN-665033; US-Patent-Class-60-202; US-Patent-Class-313-230; US-Patent-Class-313-231.3; US-Patent-Class-313-360; US-Patent-Class-315-111.3; US-Patent-Class-315-111.6) Avail: US Patent Office CSCL 21C

The anode is constructed of a woven mesh screen, preferably of stainless steel wire cloth with a mesh size less than the intergrid gap or openings of the screen grid or accelerator grid systems of the ion thruster. The screen anode is sputter coated with tantalum as a result of thruster operation. Because of the fineness of the screen anode any spalled material from the tantalum coated anode is in such small dimensions that the spalled pieces cannot interfere with the accelerator and screen grid systems and with the focusing therebetween.

Official Gazette of the U.S. Patent Office



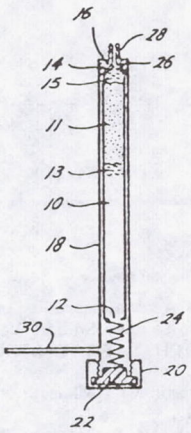
23 CHEMISTRY AND MATERIALS (GENERAL)

Includes biochemistry and organic chemistry.

N77-17161* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
ANALYSIS OF VOLATILE ORGANIC COMPOUNDS Patent
Albert Zlatkis, inventor (to NASA) (Houston Univ.) Issued 18 Jan. 1977 16 p Filed 12 Mar. 1974 Supersedes N74-19776 (12 - 11, p 1259) Sponsored by NASA
(NASA-Case-MSC-14428-1; US-Patent-4,003,257; US-Patent-Appl-SN-450504; US-Patent-Class-73-23.1; US-Patent-Class-23-230R; US-Patent-Class-23-230B; US-Patent-Class-23-230M; US-Patent-Class-23-231; US-Patent-Class-23-232R; US-Patent-Class-23-232C; US-Patent-Class-23-254R; US-Patent-Class-55-67; US-Patent-Class-55-74; US-Patent-Class-55-197; US-Patent-Class-73-61.1C) Avail: US Patent Office CSCL 07C

An apparatus and method are described for reproducibly analyzing trace amounts of a large number of organic volatiles existing in a gas sample. Direct injection of the trapped volatiles into a cryogenic percolum provides a sharply defined plug. Applications of the method include: (1) analyzing the headspace gas of body fluids and comparing a profile of the organic volatiles with standard profiles for the detection and monitoring of disease; (2) analyzing the headspace gas of foods and beverages and comparing the profile with standard profiles to monitor and control flavor and aroma; and (3) analyses for determining the organic pollutants in air or water samples.

Official Gazette of the U.S. Patent Office



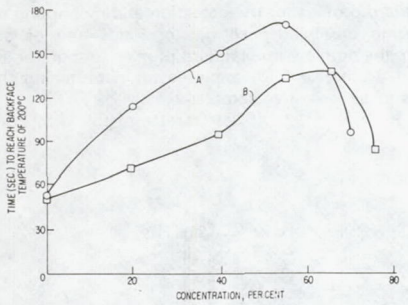
24 COMPOSITE MATERIALS

Includes laminates.

N77-11119*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
INTUMESCENT COATING CONTAINING 4.4'-DINITROSULFANILIDE Patent Application
Paul M. Sawko and Salvatore R. Riccitiello, inventors (to NASA) Filed 22 Oct. 1976 26 p
(NASA-Case-ARC-11042-1; US-Patent-Appl-SN-734902) Avail: NTIS HC A03/MF A01 CSCL 11D

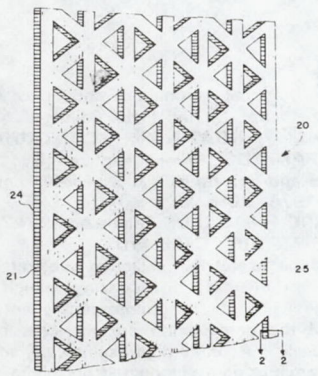
A composition useful for insulating substrates from heat is described as an intumescent coating which contains 4,4 prime-dinitrosulfanilide as the intumescent agent. The principal constituents of the composition are the char or intumescent forming ingredient 4,4 prime-dinitrosulfanilide and a polymeric binder system comprising a chlorinated polyolefin, a bisphenol A epoxy resin and a rubber-like amine hardener. The intumescent composition can be applied by any satisfactory coating technique to a desired substrate by brushing, spraying, or the like. Once hardened, the coatings dry to tough adherent films with thicknesses preferably between 30 to 70 mils. When these coatings are heated or exposed to fire they expand or intumesce by a factor of 10 to 30 times the original coating thickness and form a tough, uniform, insulating char or residue which protects the substrate from heat or flames. The intumescent characteristics of the present composition are initiated at a temperature of about 200 deg C. The thermogravimetric analysis of the present invention, and a prior art intumescent agent are compared. The instant invention intumesces at a lower temperature than the prior art compound. The differential thermal analysis data show that the lower exothermic characteristic of the sulfanilide containing coating provides an overall improvement in the basic thermal protection afforded to substrates compared to other nitroaromatic amines. The present invention exhibits

improved environmental stability and intumesces at favorable temperatures. NASA



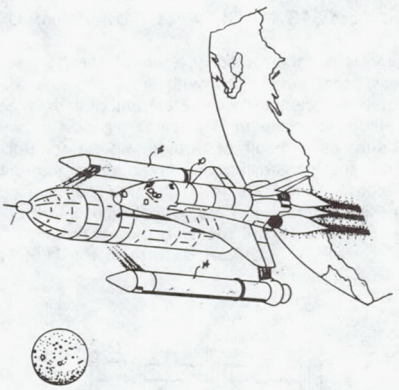
N77-15103*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
COMPOSITE SANDWICH LATTICE STRUCTURE Patent Application
Marvin D. Rhodes and Martin M. Mikulas, Jr., inventors (to NASA) Filed 14 Sep. 1976 26 p
(NASA-Case-Lar-11898-1; US-Patent-Appl-SN-723264) Avail: NTIS HC A03/MF A01 CSCL 11D

A lattice type structural panel is described which utilizes the unidirectional character of filamentary epoxy impregnated composites to produce stiff lightweight structural panels. The panels are suggested for use in constructing large area panels for space satellites. NASA



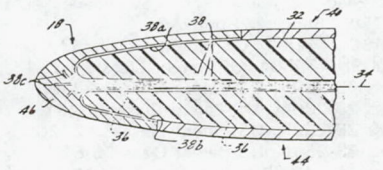
N77-15105*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SPRAYABLE LOW DENSITY ABLATOR Patent Application
Max H. Sharpe, William E. Hill, William G. Simpson, James M. Carter, Edwin L. Brown, Harry M. King, Paul H. Schuerer, and David D. Webb, inventors (to NASA) Filed 19 Jan. 1977 24 p
(NASA-Case-MFS-23506-1; US-Patent-Appl-SN-760809) Avail: NTIS HC A02/MF A01 CSCL 11D

A sprayable, low density ablative composition is described. The composition consists of: (1) 100 parts by weight of a mixture of 25-65% by weight of phenolic microballoons, 0-20% by weight of glass microballoons, 4-10% by weight of glass fibers, 25-45% by weight of an epoxy-modified polyurethane resin, 2-4 by weight of a benetonite dispersing aid and 1-2% by weight of an alcohol activator for the bentonite. NASA



N77-19170* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LEADING EDGE PROTECTION FOR COMPOSITE BLADES Patent
James W. Brantley (GE Co., Cincinnati) and Thomas P. Irwin, inventors (to NASA) (GE Co., Cincinnati) Issued 8 Feb. 1977 6 p Filed 17 Jul. 1975 Sponsored by NASA
(NASA-Case-LEW-12550-1; US-Patent-4,006,999; US-Patent-Appl-SN-596905; US-Patent-Class-416-224; US-Patent-Class-416-230) Avail: US Patent Office CSCL 11D

A laminated filament composite structure, such as an airfoil for use in an environment in which it is subjected to both foreign object impact and bending is provided with improved leading edge protection. At least one fine wire mesh layer is partially bonded within the composite structure along its neutral bending axis. A portion of the wire mesh layer extends beyond the neutral bending axis and partially around the leading edge where it is bonded to the outer periphery of the primary composite structure. The wire mesh is clad with a metal such as nickel to provide an improved leading edge protective device which is firmly anchored within the composite structure. Also described is a novel method of constructing a composite airfoil so as to further minimize the possibility of losing the leading edge protective device due to delamination caused by impact and bending.
Official Gazette of the U.S. Patent Office



N77-19171* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

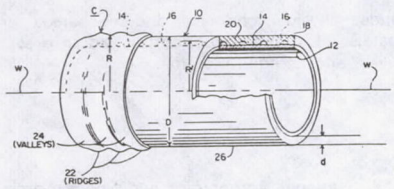
METHOD OF MAKING REINFORCED COMPOSITE STRUCTURE Patent

Lee C. McCandless (General Technologies Corp., Reston, Va.) and Glenn E. Weber, inventors (to NASA) (General Technologies Corp., Reston, Va.) Issued 2 Nov. 1976 6 p Filed 19 Apr. 1974 Supersedes N76-16181 (14 - 07, p 0817) Sponsored by NASA

(NASA-Case-LEW-12619-1; US-Patent-3,989,602; US-Patent-Appl-SN-462424; US-Patent-Class-204-9; US-Patent-Class-29-527.2; US-Patent-Class-204-16; US-Patent-Class-204-40) Avail: US Patent Office CSCL 11D

High strength nickel matrix structures are achieved by using reinforcing filament windings. Metal matrix materials were electro-formed on and between the windings to form each new layer of the composite structure.

Official Gazette of the U.S. Patent Office



N77-19173*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

LOW DENSITY BISMALEIMIDE-CARBON MICROBALLOON COMPOSITES Patent Application

Demetrius A. Kourtides and John A. Parker, inventors (to NASA) Filed 16 Mar. 1977 25 p

(NASA-Case-ARC-11040-1; US-Patent-Appl-SN-778195) Avail: NTIS HC A02/MF A01 CSCL 11D

Composite laminate structures of glass cloth are reported that are preimpregnated with polybismaleimide resin and adhered to a polybismaleimide glass or aromatic polyamide paper honeycomb cell structure filled, or partially filled, with a syntactic foam consisting of a mixture of bismaleimide resin and carbon microballoons. The carbon microballoons are prepared by pyrolyzing phenolic microballoons and subsequently bonded by using a 2% bismaleimide solution. The laminate structures are cured for two hours at 477 K and are adhered to the honeycomb bismaleimide adhesive using a pressure of 700kN/ sq m pressure at 450 K. The laminate composite is then post-cured for two hours at 527 K to produce a composite laminate having a density in the range from about 95 kilograms per cubic meter to 130 kilograms per cubic meter. NASA

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.*

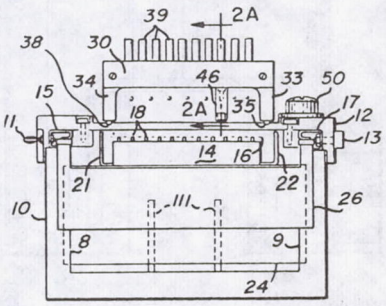
N77-12157*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

AUTOMATIC MULTIPLE-SAMPLE APPLICATOR AND ELECTROPHORESIS APPARATUS Patent Application

Benjamin W. Grunbaum, inventor (to NASA) (Calif. Univ., Berkeley) Filed 24 Nov. 1976 18 p Sponsored by NASA

(NASA-Case-ARC-10991-1; US-Patent-Appl-SN-744574) Avail: NTIS HC A02/MF A01 CSCL 07D

A multiple sample applicator is described which coacts with a novel tank cover to permit an operator either to depress a single button, thus causing multiple samples to be deposited on the gel or on the membrane simultaneously, or to depress one or more sample applicators separately by means of a separate button for each applicator. Greater resolution is achieved by performing two dimensional migrations in a square gel tray. First, the sample is pulled apart in a linear path by the electric current, and then the square gel tray is lifted and turned 90 deg so that the first migration is pulled apart from an orthogonal direction. The square gel tray is held in place at two opposite corners by retainers on the temperature controlled plate. These retainers insure an exact 90 deg change when the tray is repositioned. NASA



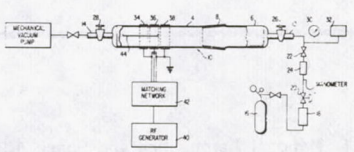
N77-17178*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PROCESS FOR PREPARING HIGHER OXIDES OF THE ALKALI AND ALKALINE EARTH METALS Patent Application

Pasupati Sadhukhan (Occidental Res. Corp.) and Alexis T. Bell, inventors (to NASA) (Calif. Univ., Berkeley) Filed 19 Jan. 1977 16 p Sponsored by NASA

(NASA-Case-ARC-10992-1; US-Patent-Appl-SN-760810) Avail: NTIS HC A02/MF A01 CSCL 07D

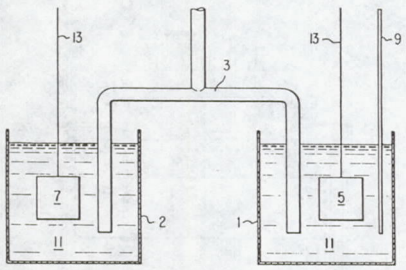
High purity inorganic higher oxides of the alkali and alkaline earth metals are prepared by subjecting the hydroxide of the metal to a radio frequency discharge sustained in oxygen. The process is particularly adaptable to the production of high purity potassium superoxide (KO2) by subjecting potassium hydroxide to glow discharge sustained in oxygen under the pressure of about 0.75 to 1.00 torr. NASA



25 INORGANIC AND PHYSICAL CHEMISTRY

N77-18238*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DEVICE FOR THE DETECTION OF PHENOL AND RELATED COMPOUNDS Patent Application
Julian G. Schiller (Pittsburgh Univ.) and C. C. Liu, inventors (to NASA) (Pittsburgh Univ.) Filed 25 Feb. 1977 22 p
(Grant NsG-3002)
(NASA-Case-LEW-12513-1; US-Patent-Appl-SN-772167) Avail: NTIS HC A02/MF A01 CSCL 07D

A method is described which permits the selective oxidation and potentiometric detection of phenol and related compounds in an electrochemical cell. An anode coated with a gel immobilized oxidative enzyme and a cathode are each placed in an electrolyte solution. The potential of the cell is measured by a potentiometer connected to the electrodes. NASA



26 METALLIC MATERIALS

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

N77-20201* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ZIRCONIUM MODIFIED NICKEL-COPPER ALLOY Patent
John D. Whittenberger, inventor (to NASA) Issued 15 Mar. 1977 5 p Filed 5 Jun. 1975 Supersedes N75-26087 (13 - 17, p 2086)
(NASA-Case-LEW-12245-1; US-Patent-4,012,237; US-Patent-Appl-SN-584094; US-Patent-Class-148-2; US-Patent-Class-75-170; US-Patent-Class-148-12.7N; US-Patent-Class-148-20.3; US-Patent-Class-148-32.5; US-Patent-Class-148-162) Avail: US Patent Office CSCL 11F

An improved material for use in a catalytic reactor which reduces nitrogen oxide from internal combustion engines is in the form of a zirconium-modified, precipitation-strengthened nickel-copper alloy. This material has a nominal composition of Ni-30 Cu-0.2 Zr and is characterized by improved high temperature mechanical properties. Official Gazette of the U.S. Patent Office

N77-21217*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
REDUCED CHROMIUM STAINLESS STEEL ALLOYS Patent Application
Joseph R. Stephens and Charles A. Barrett, inventors (to NASA) Filed 15 Apr. 1977 9 p
(NASA-Case-LEW-12543-1; US-Patent-Appl-SN-788044) Avail: NTIS HC A02/MF A01 CSCL 11F

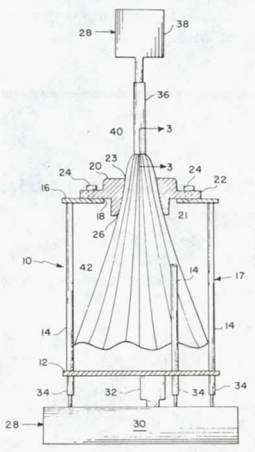
An austenitic stainless steel alloy is provided which contains reduced amounts of chromium as compared with stainless steels such as AISI Type 304 but whose oxidation resistance, corrosion resistance, strength and ductility are at least as good as those of such stainless steels. In a preferred embodiment, the alloy comprises, by weight percent, iron-12 chromium-10 nickel-2 aluminum-2 molybdenum-1.1 manganese-0.61 silicon-0.06 carbon. In a second preferred embodiment, the alloy comprises, by weight percent, iron-12 chromium-10 nickel-2.65 silicon-1.1 manganese-0.06 carbon. NASA

27 NONMETALLIC MATERIALS

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

N77-10198*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
NOZZLE EXTRACTION PROCESS AND HANDLEMETER FOR MEASURING HANDLE Patent Application
Vernon L. Alley, Jr. and Austin P. McHatton, inventors (to NASA) Filed 19 Oct. 1976 29 p
(NASA-Case-LAR-12147-1; US-Patent-Appl-SN-733825) Avail: NTIS HC A03/MF A01 CSCL 11E

A method and apparatus for quantitatively measuring the handle of fabrics and other flexible materials is described. Handle is that term used to refer to the qualities of drapability, flexibility, compressibility, foldability, stretchability, pliability, etc., possessed by fabrics and other flexible materials. The handle of a material sample is quantified by measuring the force required to draw the sample through an orifice and expressing the resultant extractive force as a function of test apparatus geometry and the amount of sample drawn through the orifice. A quantative measure of handle is determined by a circular sectional convergent nozzle, to be defined as handle modulus, for the sample in question. Official Gazette of the U.S. Patent Office



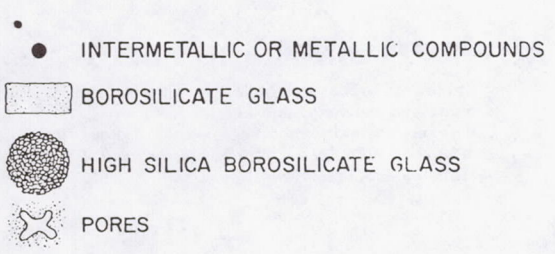
N77-10201*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

REACTION CURED GLASS AND GLASS COATINGS Patent Application

Howard E. Goldstein, Daniel B. Leiser (Stanford Univ., Calif.), and Victor E. Katvala, inventors (to NASA) Filed 29 Oct. 1976 19 p

(NASA-Case-ARC-11051-1; US-Patent-Appl-SN-726910) Avail: NTIS HC A02/MF A01 CSCL 11C

Reaction cured glass and glass coating are prepared by reacting a compound from the group of compounds consisting of silicon tetraboride, silicon hexaboride, other boron silicides, boron and mixtures thereof with a reactive glass frit composed of a porous high silica borosilicate glass and boron oxide. The glassy composites are useful as coatings on low density fiberous porous silica insulations used as heat shields and for articles such as reaction vessels that are subjected to high temperatures with rapid heating and cooling and that require resistance to temperature and repeated thermal shock at temperatures up to about 1482 C (2700PF). NASA



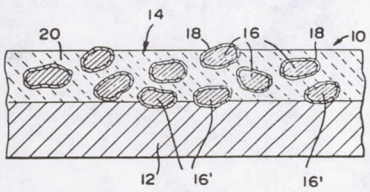
N77-13217* National Aeronautics and Space Administration. Pasadena Office, Calif.

HIGH TEMPERATURE OXIDATION RESISTANT CERMET COMPOSITIONS Patent

Wayne M. Phillips, inventor (to NASA) (JPL) Issued 9 Nov. 1976 8 p Filed 20 Nov. 1975 Supersedes N76-13293 (14-04, p 0433) Sponsored by NASA

(NASA-Case-NPO-13666-1; US-Patent-3,990,860; US-Patent-Appl-SN-633877; US-Patent-Class-29-182.5) Avail: US Patent Office CSCL 11B

Cermet compositions are designed to provide high temperature resistant refractory coatings on stainless steel or molybdenum substrates. A ceramic mixture of chromium oxide and aluminum oxide form a coating of chromium oxide as an oxidation barrier around the metal particles, to provide oxidation resistance for the metal particles. Author



N77-14262*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

PROCESS FOR PRODUCING FLAME RESISTANT POLYAMIDES AND PRODUCTS PRODUCED THEREBY Patent Application

Madeline S. Toy (Science Applications, Inc., La Jolla, Calif.) and Roger S. Stringham, inventors (to NASA) (Science Applications, Inc., La Jolla, Calif.) Filed 6 Dec. 1976 16 p Sponsored by NASA

(NASA-Case-MSC-16074-1; US-Patent-Appl-SN-747674) Avail: NTIS HC A02/MF A01 CSCL 07C

A photochemical process for producing aromatic polyamides with improved nonflammability characteristics is described. The aromatic polyamide substrate is contacted with a gaseous medium containing a halooefinic material, in a minor amount, and in inert diluent. The aromatic substrate is irradiated with radiation of sufficient energy to effect chemical bonding or grafting of the halooefin to the substrate. The resultant product consists of an aromatic polyamide substrate with halocarbon groups chemically bound to the surface that has enhanced flame resistance in oxygen enriched environment without degradation of physical properties and appearance. NASA

N77-15192*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

POLYIMIDE ADHESIVES Patent Application

Donald J. Progar, Vernon L. Bell, and Terry L. StClair, inventors (to NASA) Filed 22 Oct. 1976 14 p

(NASA-Case-LAR-12181-1; US-Patent-Appl-SN-734901) Avail: NTIS HC A02/MF A01 CSCL 11A

A process of preparing aromatic polyamide-acids is described for use as adhesives by reacting an aromatic dianhydride to an approximately equimolar amount of an aromatic diamine in a water or lower alkanol miscible ether solvent. The polyamide acids are converted to polyimides by heating to the temperature range of 200 - 300 C. The polyimides are thermally stable and insoluble in ethers and other organic solvents. NASA

N77-17245*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

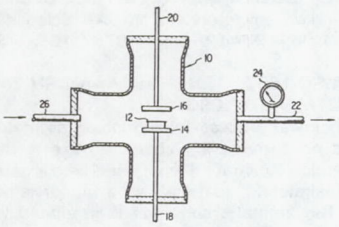
PREPARATION OF DIELECTRIC COATINGS OF VARIABLE DIELECTRIC CONSTANT BY PLASMA POLYMERIZATION Patent Application

Martin Hudis (Allis-Chalmers Mfg. Co., Milwaukee, Wis.) and Theordore Wydeven, inventors (to NASA) Filed 11 Feb. 1977 19 p

(NASA-Case-ARC-10892-2; US-Patent-Appl-SN-767912) Avail: NTIS HC A02/MF A01 CSCL 11C

A plasma polymerization process for the deposition of a dielectric polymer coating on a substrate is reported that reached the substrate in a closed reactor between two temperature controlled electrodes connected to a power supply. The vacuum within the closed reactor caused a monomer gas or a gas mixture of a monomer and diluent to flow into the reactor, generating a plasma between the electrodes. The dielectric constant of the polymer coating being deposited is controlled by regulating gas total and partial pressures, electric field strength and frequency, and current density. A monomer, such as a polar saturated or unsaturated nitrogen-containing compound, or a monomer and diluent, such as a saturated or unsaturated aliphatic hydrocarbon

and nitrogen, is thus polymerized to form a dielectric coating of varying dielectric constant. NASA



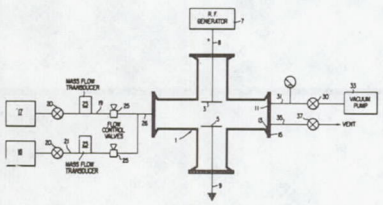
N77-18265*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

A REVERSE OSMOSIS MEMBRANE OF HIGH UREA REJECTION PROPERTIES Patent Application

Catherine C. Johnson and Theodore Wydeven, inventors (to NASA) Filed 9 Jun. 1976 21 p

(NASA-Case-ARC-10980-1; US-Patent-Appl-SN-694407) Avail: NTIS HC A02/MF A01 CSCL 11D

Reverse osmosis water purification polymeric membranes with high urea and salt rejection properties are reported. An unsaturated hydrocarbon monomer plasma and nitrogen gas were utilized for polymer deposition onto a substrate, such that nitrogen was incorporated within the polymer in a chemically combined form. NASA



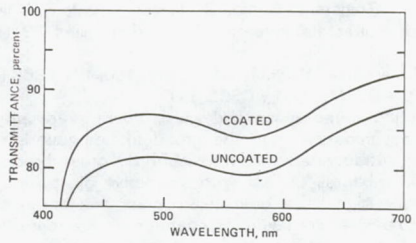
N77-20256*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

OXYGEN POST-TREATMENT OF PLASTIC SURFACES COATED WITH PLASMA POLYMERIZED SILICON-CONTAINING MONOMERS Patent Application

Theodore J. Wydeven, Jr. and John R. Hollahan, inventors (to NASA) (Tegal Corp., Richmond, Calif.) Filed 21 Mar. 1977 13 p

(NASA-Case-ARC-10915-2; US-Patent-Appl-SN-779883) Avail: NTIS HC A02/MF A01 CSCL 11G

The abrasion resistance of plastic surfaces coated with polymerized organosilanes is significantly improved by post-treatment of the polymerized silane in an oxygen plasma. For optical purposes, the advantages of this post-treatment are developed with a transparent polycarbonate resin substrate coated with plasma polymerized vinyltrimethoxysilane. NASA



Transmission spectra of oxygen post-treated vinyltrimethoxysilane coated polycarbonate and uncoated polycarbonate.

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.*

N77-10213* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

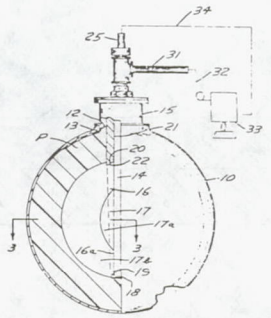
CASTING PROPELLANT IN ROCKET ENGINE Patent

John E. Roach (Thiokol Chemical Corp., Bristol, Pa.) and Stuart C. Froehling, inventors (to NASA) (Thiokol Chemical Corp., Bristol, Pa.) Issued 5 Oct. 1976 8 p Filed 14 Nov. 1962 Sponsored by NASA

(NASA-Case-LAR-11995-1; US-Patent-3,983,780; US-Patent-Appl-SN-238826; US-Patent-Class-86-1R; US-Patent-Class-102-99; US-Patent-Class-264-3R) Avail: US Patent Office CSCL 21I

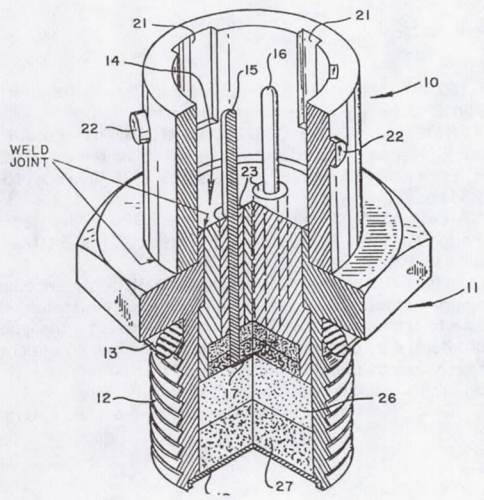
A method is described for casting a solid propellant in the casing of a rocket engine having a continuous wall with a single opening which is formed by leaves of a material which melt at a temperature of the propellant and with curved edges concentric to the curvature of the spherical casing. The leaves are inserted into the spherical casing through the opening forming a core having a greater width than the width of the single opening and with curved peripheral edges. The cast propellant forms a solid mass and then heated to melt the leaves and provide a central opening with radial projecting flutes.

Official Gazette of the U.S. Patent Office



N77-17258*# National Aeronautics and Space Administration. Pasadena Office, Calif.
ELECTROEXPLOSIVE DEVICE Patent Application
Vincent J. Menichelli, inventor (to NASA) (JPL) Filed 8 Nov. 1976 19 p
(Contract NAS7-100)
(NASA-Case-NPO-13858-1; NASA-Case-NPO-13859-1; US-Patent-Appl-SN-740153) Avail: NTIS HC A02/MF A01 CSCL 19A

An improved electroexplosive device is described. It consists of a header with contact pins sunk in a heat sink layer, and a bridge circuit placed across the contact pins. Layers of igniter and output charges are placed over the heat sink layer and the bridge circuit. The device provides a great reliability against inadvertent magnetic or electrostatic charge ignition. I.M.

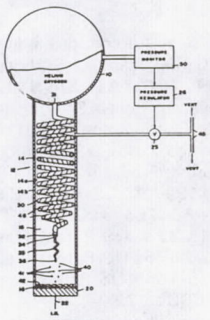


31 ENGINEERING (GENERAL)

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

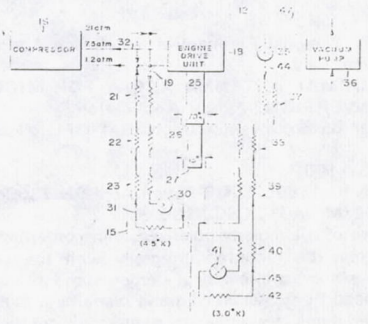
N77-10229* National Aeronautics and Space Administration. Pasadena Office, Calif.
CRYOSTAT SYSTEM FOR TEMPERATURES ON THE ORDER OF 2 DEG K OR LESS Patent
Charles G. Miller (JPL) and James B. Stephens, inventors (to NASA) (JPL) Issued 5 Oct. 1976 9 p Filed 24 Jul. 1975 Supersedes N75-29277 (13 - 20, p 2507) Sponsored by NASA
(NASA-Case-NPO-13459-1; US-Patent-3,983,714; US-Patent-Appl-SN-598967; US-Patent-Class-62-217; US-Patent-Class-62-514JT) Avail: US Patent Office CSCL 20L

A cryostat system for cooling a device to a temperature on the order of 2 K or less includes a dewar, in which helium, in other than the superfluid state, is stored. Helium flows from the dewar through a heat exchanger tube and a restrictor tube, which controls the helium flow rate, into the cavity of a heat exchanger, to whose outer wall the device to be cooled is attached. A pressure regulator value controls the pressure in the cavity to be very low. As the helium exits the restrictor tube into the cavity, due to low pressure cavity, it becomes an aerosol mixture of helium gas and superfluid helium droplets at the desired temperature. The latter form a thin layer or film of superfluid helium on the inner side of the heat exchanger wall and thereby cool the device, which is attached to the wall to the desired temperature. Official Gazette of the U.S. Patent Office



N77-15219*# National Aeronautics and Space Administration. Pasadena Office, Calif.
MULTISTATION REFRIGERATION SYSTEM Patent Application
Ervin R. Wiebe, inventor (to NASA) (JPL) Filed 8 Sep. 1976 13 p
(Contract NAS7-100)
(NASA-Case-NPO-13839-1; US-Patent-Appl-SN-712981) Avail: NTIS HC A02/MF A01 CSCL 20D

A closed cycle refrigeration (CCR) system is disclosed for providing cooling at different temperatures to different parts of a maser. The CCR includes a first station for cooling the maser's parts, except the amplifier portion, to 4.5 K. The CCR further includes means with a 3.0 K station for cooling the maser's amplifier to 3.0 K and, thereby, increases the maser's gain and/or bandwidth by a significant factor. The means which provide the 3.0 K cooling include a pressure regulator, heat exchangers, an expansion valve, and a vacuum pump, which coact to cause helium, provided from a compressor, to liquefy and thereafter expand so as to vaporize. The heat of vaporization for the helium is provided by the maser amplifier, which is thereby cooled to 3.0 K. NASA



32 COMMUNICATIONS

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

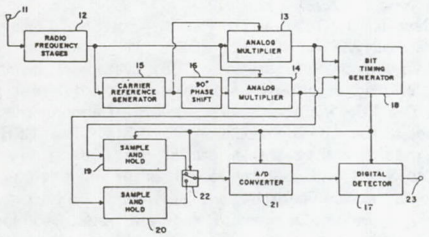
For related information see also *04 Aircraft Communications and Navigation* and *17 Spacecraft Communications, Command and Tracking.*

N77-10392* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

ANTI-MULTIPATH DIGITAL SIGNAL DETECTOR Patent

John H. Painter, inventor (to NASA) Issued 5 Oct. 1976 20 p Filed 25 Mar. 1975 Continuation-in-part of abandoned US Patent Appl. SN-412379, filed 2 Nov. 1973 published under the second Trial Voluntary Protest Program as B 561,764, 27 Jan. 1976 (NASA-Case-LAR-11827-1; US-Patent-3,984,634; US-Patent-Appl-SN-561764; US-Patent-Class-178-88; US-Patent-Class-325-323; US-Patent-Class-325-349; US-Patent-Class-325-476; US-Patent-Class-235-150.1; US-Patent-Class-235-156; US-Patent-Appl-SN-412379) Avail: US Patent Office CSCL 17B

A detector is described for radio signals which have been transmitted through a multipath medium. The device operates in conjunction with the radio frequency portion of a receiver to detect digital signals which have been transmitted in known modulation formats. The transmitted signal is constructed by assigning known and distinct modulation waveforms to a sequence of message symbols, or digits. The basic digital message, which the detector is to reconstruct consists of a sequence of digits, each lasting for a fixed time, say T seconds, and each picked from an alphabet of arbitrary, but fixed, size. For example, in a binary message, the alphabet consists of the digits 0 and 1. In a quarternary message, the alphabet consists of the digits 0, 1, 2, and 3. Official Gazette of the U.S. Patent Office



N77-11269*# National Aeronautics and Space Administration. Pasadena Office, Calif.

THIN CONFORMAL ANTENNA ARRAY FOR MICROWAVE POWER CONVERSION Patent Application

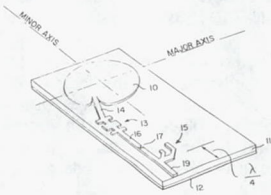
Richard M. Dickinson, inventor (to NASA) (JPL) Filed 6 Oct. 1976 16 p

(Contract NAS7-100)

(NASA-Case-NPO-13886-1; US-Patent-Appl-SN-730045) Avail: NTIS HC A02/MF A01 CSCL 10B

A structure of a circularly polarized, thin conformal, antenna array which may be mounted integrally with the skin of an aircraft employs microstrip elliptical elements and interconnecting feed lines spaced from a circuit ground plane by a thin dielectric layer. The feed lines are impedance matched to the elliptical antenna elements by selecting a proper feedpoint inside the periphery of the elliptical antenna elements. Diodes connected between the feed lines and the ground plane rectify the microwave power, and microstrip filters (low pass) connected in series with the feed lines provide dc current to a microstrip bus. Low impedance matching strips are included between the elliptical elements and the rectifying and filtering elements.

NASA



N77-12239* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

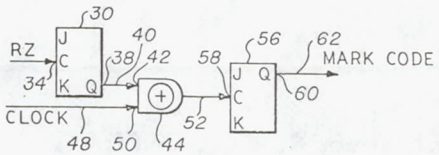
DIFFERENTIAL PULSE CODE MODULATION Patent

Calvin F. Herman, inventor (to NASA) Issued 26 Oct. 1976 9 p Filed 29 Jan. 1975 Supersedes N75-19480 (13 - 11, p 1231)

(NASA-Case-MSC-12506-1; US-Patent-3,988,729; US-Patent-Appl-SN-545283; US-Patent-Class-340-347DD) Avail: US Patent Office CSCL 17B

A differential pulse code modulation (DPCM) encoding and decoding method is described along with an apparatus which is capable of transmission with minimum bandwidth. The apparatus is not affected by data transition density, requires no direct current (DC) response of the transmission link, and suffers from minimal ambiguity in resolution of the digital data.

Official Gazette of the U.S. Patent Office



N77-12240* National Aeronautics and Space Administration. Pasadena Office, Calif.

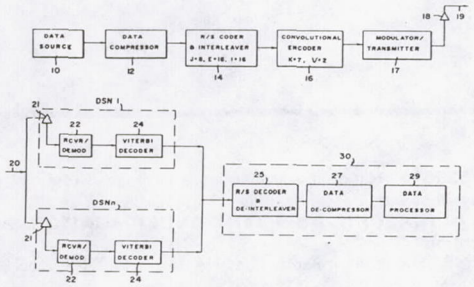
SPACE COMMUNICATION SYSTEM FOR COMPRESSED DATA WITH A CONCATENATED REED-SOLOMON-VITERBI CODING CHANNEL Patent

Robert F. Rice (JPL) and Edward E. Hilbert, inventors (to NASA) (JPL) Issued 26 Oct. 1976 15 p Filed 23 Jun. 1975 Supersedes N75-26207 (13 - 17, p 2100) Sponsored by NASA

(NASA-Case-NPO-13545-1; NASA-Case-NPO-13543-1; US-Patent-3,988,677; US-Patent-Appl-SN-589173; US-Patent-Class-325-41; US-Patent-Class-340-146.1AL; US-Patent-Class-340-146.1AQ; US-Patent-Class-340-146.1AV) Avail: US Patent Office CSCL 17B

A space communication system incorporating a concatenated Reed Solomon Viterbi coding channel is discussed for transmitting compressed and uncompressed data from a spacecraft to a data

processing center on Earth. Imaging (and other) data are first compressed into source blocks which are then coded by a Reed Solomon coder and interleaver, followed by a convolutional encoder. The received data is first decoded by a Viterbi decoder, followed by a Reed Solomon decoder and deinterleaver. The output of the latter is then decompressed, based on the compression criteria used in compressing the data in the spacecraft. The decompressed data is processed to reconstruct an approximation of the original data-producing condition or images. Official Gazette of the U.S. Patent Office

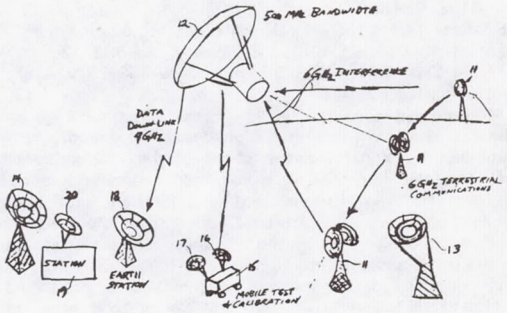


N77-12247*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

SYSTEMS AND METHODS FOR DETERMINING RADIO FREQUENCY INTERFERENCE Patent Application

Klaus Johannsen (Hughes Aircraft Co., Los Angeles), Samuel Sabaroff (Hughes Aircraft Co., Los Angeles), and Varice F. Henry, inventors (to NASA) Filed 28 Oct. 1976 52 p (NASA-Case-GSC-12150-1; US-Patent-Appl-SN-736286) Avail: NTIS HC A04/MF A01 CSCL 17B

The presence, frequency and amplitude of radio frequency interference superimposed on communication links originating from a terrestrial region and including a relay in a geostationary spacecraft are determined by pointing a narrow beam antenna on the satellite at the terrestrial region. The level of noise radiated from the region, in a predetermined frequency band of interest, to the antenna is measured at a terrestrial station that is usually remote from the region. Calibrating radio signals having a plurality of predetermined EIRP's and frequencies in the spectrum are transmitted from the region through the spacecraft narrow beam antenna back to the station where the levels of the received calibrating signals are separately measured for each of the frequency bands and EIRP's and compared to determine interference originating from the region. NASA

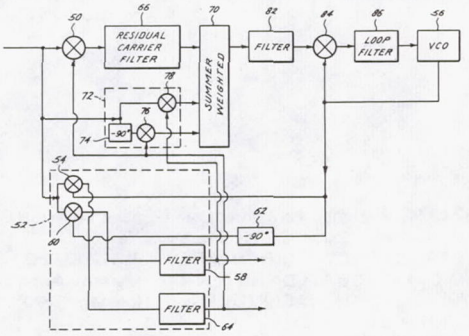


N77-12248*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

RECEIVING AND TRACKING PHASE MODULATED SIGNALS Patent Application

Salvador Villarreal, Stuart Donald Lenett, and Herbert S. Kobayashi, inventors (to NASA) Filed 2 Nov. 1976 14 p (NASA-Case-MSC-16170-1; US-Patent-Appl-SN-737975) Avail: NTIS HC A02/MF A01 CSCL 17B

A receiver is described for tracking and demodulating several types of phase modulated communications, either analog or digital data, for either residual carrier or suppressed carrier signal and for phase modulation or keying of two, four or higher phase angles, from 0 deg through 360 deg. A carrier component signal and a converted series sideband component signal are obtained from the incoming signal and summed to produce a carrier tracking signal, permitting more accurate tracking of the above types of phase modulated data. NASA



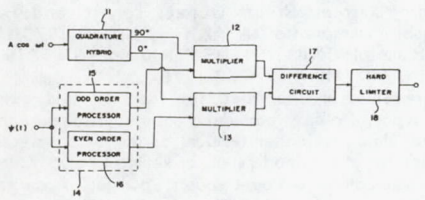
N77-14292* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

PHASE MODULATING WITH ODD AND EVEN FINITE POWER SERIES OF A MODULATING SIGNAL Patent

Chase P. Hearn, Richard H. Couch, and Lewis R. Wilson, inventors (to NASA) (LTV Aerospace Corp., Hampton, Va.) Issued 7 Dec. 1976 8 p Filed 29 Sep. 1975 Supersedes N76-10356 (14 - 01, p 0048)

(NASA-Case-LAR-11607-1; US-Patent-3,996,532; US-Patent-Appl-SN-617895; US-Patent-Class-332-22; US-Patent-Class-325-145; US-Patent-Class-332-23R) Avail: US Patent Office CSCL 17B

Method and apparatus is presented for producing a phase-modulated waveform having a high degree of linearity between the modulating signal and the phase of the modulated carrier signal. Two signals representing finite odd and even power series transformations of the modulating signal are produced and multiplied with two quadrature components of the input carrier signal, respectively. One of the multiplied signals is subtracted from the other and the resulting signal is hard-limited to produce a phase-modulated output signal. The means for producing the two signals representing the odd and even power series of the modulating signal includes means for varying the coefficients of the two power series. By means of an existing computer program, the coefficients of the two power series are selected such that there is an extremely high degree of linearity between the modulating signal and the phase of the modulated carrier signal. Official Gazette of the U.S. Patent Office



N77-15233*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

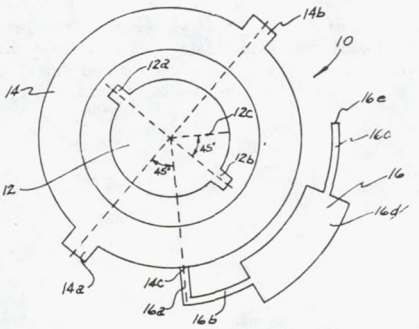
DUAL FREQUENCY CIRCULARLY POLARIZED MICROWAVE INTEGRATED ANTENNA Patent Application

I-Ping Yu, inventor (to NASA) (Lockheed, Houston, Tex.) Filed 15 Dec. 1976 20 p

(Contract NAS9-12200)

(NASA-Case-MSC-16100-1; US-Patent-Appl-SN-750796) Avail: NTIS HC A02/MF A01 CSCL 17B

An antenna assembly operable in two frequency ranges is provided by using microstrip construction to obtain a first planar antenna element circumscribed by a second planar antenna element, each fitted with appropriate phase shifters. The geometry of the two antenna elements is utilized to couple the antenna assembly with selected impedance matching. NASA



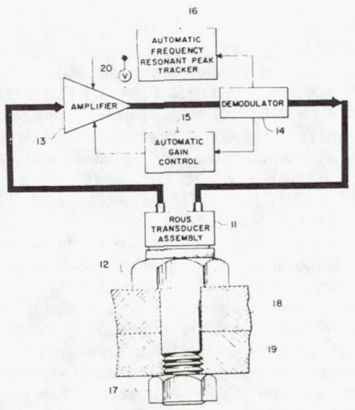
N77-15236*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

A CW ULTRASONIC BOLT TENSIONING MONITOR Patent Application

Joseph S. Heyman, inventor (to NASA) Filed 23 Dec. 1976 22 p

(NASA-Case-LAR-12016-1; US-Patent-Appl-SN-754066) Avail: NTIS HC A02/MF A01 CSCL 20N

This invention is a CW ultrasonic device for measuring frequency shifts of the peak of a mechanical resonance in a body. One application of the device is measuring the strain in a bolt. It also has other applications, such as measuring the thickness, the depth of a flaw, the elongation, and changes in velocity of sound in a body. The body is connected, by means of a CW transducer, to electrical circuit means including a narrow band RF amplifier to form a closed loop feedback marginal oscillator that frequency locks the device to the peak of a mechanical resonance in the body. When the frequency of this peak changes, because of a physical change in the body, the frequency of the oscillator changes. The device includes an automatic frequency resonant peak tracker that produces a voltage that is related to a change in frequency of the oscillator. This voltage is applied to the RF amplifier to change the center of its frequency band to include the frequency of the peak and is a measure of the frequency shift. NASA



N77-17325*# National Aeronautics and Space Administration. Pasadena Office, Calif.

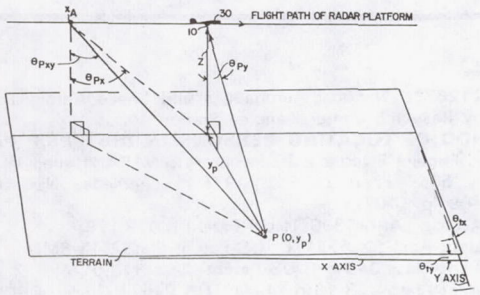
SURFACE ROUGHNESS MEASURING SYSTEM Patent Application

Atul Jain, inventor (to NASA) (JPL) Filed 24 Nov. 1976 42 p

(Contract NAS7-100)

(NASA-Case-NPO-13862-1; US-Patent-Appl-SN-744577) Avail: NTIS HC A03/MF A01 CSCL 17I

The technique is based upon processing a signal obtained from a synthetic aperture imaging radar for correlation of different images of ocean waves, or peaks of rough terrain utilizing means for compressing the radar signal over different widths of the available chirp or Doppler bandwidths, and means for cross correlating one of these images with each of the others. The measured height is the slope of the cross correlation value determined to the spacing value used. Both electronic and optical radar signal data compressors and cross-correlations are disclosed for implementation of the system. Author



N77-18307* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

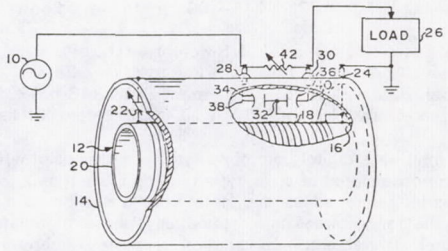
NOTCH FILTER Patent

Glenn B. Shelton, inventor (to NASA) (Sperry Rand Corp., Huntsville, Ala.) Issued 8 Feb. 1977 5 p Filed 14 Apr. 1976 Supersedes N76-22462 (14 - 13, p 1653) Sponsored by NASA

(NASA-Case-MFS-23303-1; US-Patent-4,007,434; US-Patent-Appl-SN-676957; US-Patent-Class-333-75; US-Patent-Class-333-70R; US-Patent-Class-333-76; US-Patent-Class-333-82B) Avail: US Patent Office CSCL 09C

A notch filter for the selective attenuation of a narrow band of frequencies out of a larger band was developed. A helical resonator is connected to an input circuit and an output circuit through discrete and equal capacitors, and a resistor is connecte between the input and the output circuits.

Official Gazette of the U.S. Patent Office



N77-19290*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

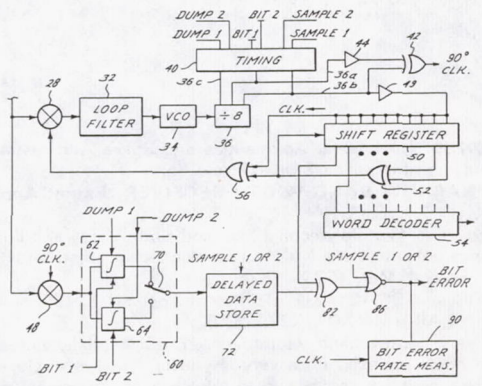
BIT ERROR RATE MEASUREMENT ABOVE AND BELOW BIT RATE TRACKING THRESHOLD Patent Application

Herbert S. Kobayashi, Joe Fowler, and William Kurple, Inventors (to NASA) (Lockheed Electronics Co., Houston, Tex.) Filed 2 Mar. 1977 16 p

(Contract NAS9-12200)

(NASA-Case-MSC-12743-1; US-Patent-Appl-SN-765167) Avail: NTIS HC A02/MF A01 CSCL 17B

Bit error rate is measured by sending a pseudorandom noise (PRN) code test signal simulating digital data through digital equipment to be tested. An incoming signal representing the response of the equipment being tested, together with any added noise, is received and tracked by being compared with a locally generated PRN code. Once the locally generated PRN code matches the incoming signal a tracking lock is obtained. The incoming signal is then integrated and compared bit-by-bit against the locally generated PRN code and differences between bits being compared are counted as bit errors. NASA



N77-20289* National Aeronautics and Space Administration. Pasadena Office, Calif.

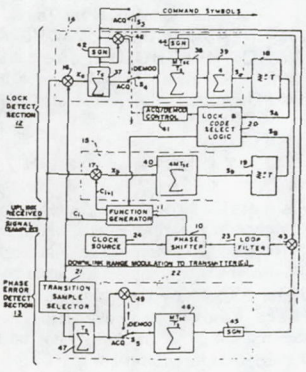
MULTIPLE RATE DIGITAL COMMAND DETECTION SYSTEM WITH RANGE CLEAN-UP CAPABILITY Patent

James R. Lesh (JPL) and Stanley A. Butman, inventors (to NASA) (JPL) Issued 15 Mar. 1977 14 p Filed 17 Feb. 1976 Supersedes N76-18826 (14 - 09, p 1174) Sponsored by NASA

(NASA-Case-NPO-13753-1; US-Patent-4,012,696; US-Patent-Appl-SN-658449; US-Patent-Class-325-4; US-Patent-Class-343-6.5R; US-Patent-Class-343-6.BR; US-Patent-Class-343-100ST) *Avail: US Patent Office* CSCL 17B

A multi-rate digital command system is disclosed which uses the composite signal of a mu-type ranging system as a subcarrier to transmit range codes and data from a station to a receiver where the range codes are sequentially phase modulated on a subcarrier of frequency by one of its own subharmonics and data is phase modulated on a selected ranging component. A range cleanup loop in a spacecraft locks the phase of a locally generated reference component to a received ranging component and retransmits the component to a ground station. When the inverse phase of a ranging component is received and detected, the cleanup loop is modified to demodulate phase modulated command symbols while continuing tracking the same ranging component. The command symbol rate is coherently related to the ranging signal component bit rate.

Official Gazette of the U.S. Patent Office



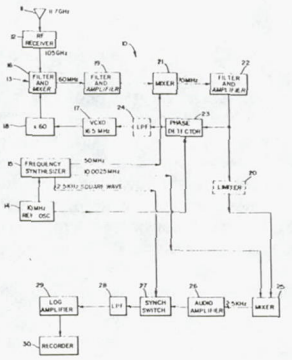
N77-20299*# National Aeronautics and Space Administration. Goddard Inst. for Space Studies, New York.

VERY NARROW BAND WIDTH RECEIVER Patent Application

Paris H. Wiley (Va. Polytechnic Inst. and State Univ.) and Eugene A. Manus, inventors (to NASA) (Va. Polytechnic Inst. and State Univ.) Filed 4 Mar. 1977 18 p

(NASA-Case-GSC-12142-1; US-Patent-Appl-SN-774553) Avail: NTIS HC A02/MF A01 CSCL 17B

A very narrow band width receiver, substantially unresponsive to noise imposed on a very low level signal is disclosed. It comprises a switch responsive to a replica of tthe signal and a reference wave having the same frequency as a carrier for the signal applied to the switch. the switch passes the signal only during one half of each cycle of the reference wave. A low pass filter, including an operational amplifier, responds to the input signal, as passed by the switch, to derive a DC signal having a magnitude indicative of the phase difference between the input signal and the phase controlled wave. NASA



N77-21267* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

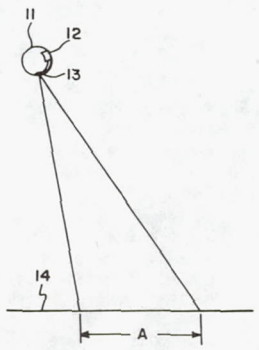
METHOD OF LOCATING PERSONS IN DISTRESS Patent

Wilford Eugene Sivertson, Jr., inventor (to NASA) Issued 19 Apr. 1977 5 p Filed 27 Feb. 1976 Supersedes N76-18315 (14 - 09, p 1107)

(NASA-Case-LAR-11390-1; US-Patent-4,019,179; US-Patent-Appl-SN-662176; US-Patent-Class-343-5MM; US-Patent-Class-340-5H; US-Patent-Class-343-5CM; US-Patent-Class-343-18B) *Avail: US Patent Office* CSCL 17I

A method for locating any person in distress in a selected area on the surface of the earth who has deployed passive radio frequency (RF) reflectors in a predetermined arrangement is analyzed. A first transparency is made in the spatial frequency domain of an image of said predetermined arrangement of said RF reflectors. The said selected area of the surface of the earth is scanned by means of a side-looking radar, on board a satellite or aircraft, to produce radar images. Second transparencies in the conventional image domain are produced from the radar images. It is then determined from the first and second transparencies, by means of complex spatial filtering.

Official Gazette of the U.S. Patent Office



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*.

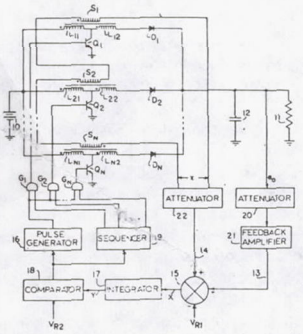
N77-10428* National Aeronautics and Space Administration. Pasadena Office, Calif.

THE dc-TO-dc CONVERTERS EMPLOYING STAGGERED-PHASE POWER SWITCHES WITH TWO-LOOP CONTROL Patent

Gene W. Wester, inventor (to NASA) (JPL) Issued 5 Oct. 1976 7 p Filed 17 Dec. 1974 Supersedes N75-15876 (13 - 07, p 0764) Published under the second Trial Voluntary Protest Program as B 533 734, 27 Jan. 1976 Sponsored by NASA (NASA-Case-NPO-13512-1; US-Patent-3,984,799; US-Patent-Appl-SN-533734; US-Patent-Class-321-2; US-Patent-Class-321-19; US-Patent-Class-323-17; US-Patent-Class-323-22T; US-Patent-Class-323-23; US-Patent-Class-323-DIG.1) Avail: US Patent Office CSCL 09C

A switched inductor voltage is coupled to a sense winding in each phase, and all sense windings are connected in series to one of two feedback loops to provide a signal that indicates when one of the power switches is on as the principal determinant of switching instants. A sequencer is triggered each time a pulse generator is triggered to turn on a different power switch in sequence at each switching instant.

Official Gazette of the U.S. Patent Office



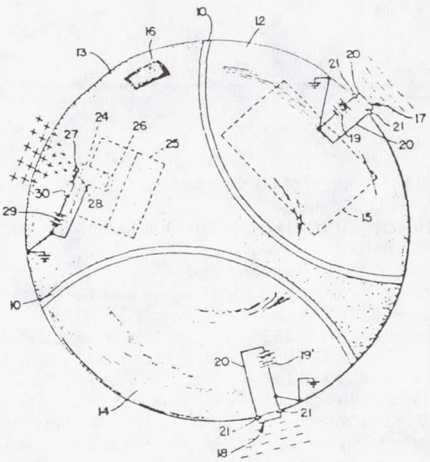
N77-10429* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

METHOD AND APPARATUS FOR NEUTRALIZING POTENTIALS INDUCED ON SPACECRAFT SURFACES Patent

Robert E. Hunter, inventor (to NASA) Issued 5 Oct. 1976 6 p Filed 11 Jul. 1975 Supersedes N75-27265 (13 - 18, p 2239) (NASA-Case-GSC-11963-1; US-Patent-3,984,730; US-Patent-Appl-SN-595197; US-Patent-Class-317-2D; US-Patent-Class-244-1A; US-Patent-Class-244-42CG; US-Patent-Class-324-72) Avail: US Patent Office CSCL 09C

A potential induced on the surface of an orbiting spacecraft is neutralized to the potential of a plasma through which the spacecraft is traveling by directing charged particles into the plasma from the spacecraft surface. The induced potential occurs in response to bombardment of the spacecraft surface by ambient charged particles which may be negative or positive. The charged particles directed into the plasma from the surface have the same polarity as the induced potential to provide the neutralization. The invention can be utilized to maintain different, electrically isolated segments of a spacecraft surface at the same potential to prevent electric discharges between the different parts and thereby protect electric circuits within the spacecraft.

Official Gazette of the U.S. Patent Office



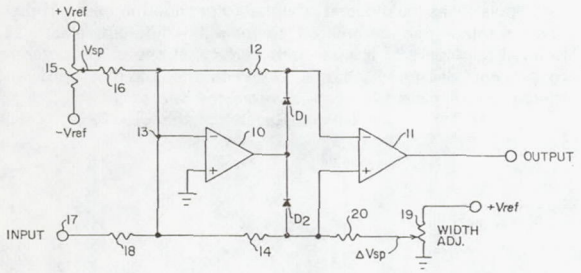
N77-11296*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

WINDOW COMPARATOR Patent Application

James M. Black, inventor (to NASA) Filed 2 Nov. 1976 16 p (NASA-Case-FRC-10090-1; US-Patent-Appl-SN-737974) Avail: NTIS HC A02/MF A01 CSCL 09C

A comparator comprising two operational amplifiers is described. The first has two feedback circuits, each having a diode connected to the amplifier output and poled for forward current conduction of opposite polarity, such that one diode conducts and then switches off while the other is held off and then conducts when the sign of the algebraic difference switches. Differential input terminals of the second operational amplifier are connected to the separate feedback circuits of the first operational amplifier. A selected window-width voltage is connected through a coupling resistor to one of the input terminals of the second operational amplifier to determine when the algebraic difference of the input signal and the set-point voltage

has exceeded a predetermined tolerance after that difference has changed signs. Author

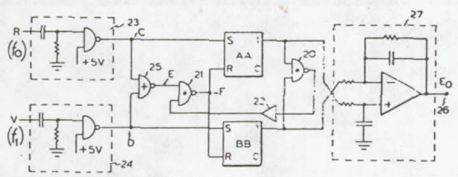


N77-13315* National Aeronautics and Space Administration. Pasadena Office, Calif.

FREQUENCY DISCRIMINATOR AND PHASE DETECTOR CIRCUIT Patent

Robert Bruce Crow, inventor (to NASA) (JPL) Issued 31 Jul. 1973 10 p Filed 3 May 1971 Sponsored by NASA (NASA-Case-NPO-11515-1; US-Patent-3,750,035; US-Patent-Appl-SN-139596; US-Patent-Class-328-133; US-Patent-Class-307-295; US-Patent-Class-307-233) Avail: US Patent Office CSCL 09A

Frequency discriminator and phase detector circuits are disclosed, each having two flip-flops, one flip-flop for each of two signals to be compared. Means are provided for causing one flip-flop to be set the majority of the time in proportion to the extent to which one signal differs from the other in frequency or phase. A method is also provided for integrating the difference between output waveforms of the flip-flops to obtain an output signal which can be used to adjust the frequency of phase of a variable signal with respect to a reference signal. NASA

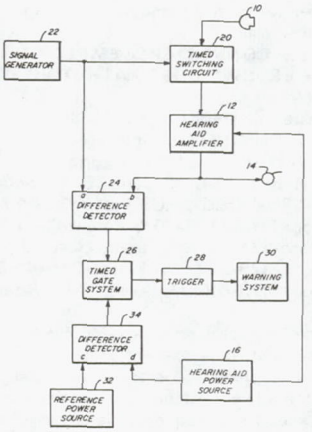


N77-13335*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

HEARING AID MALFUNCTION DETECTION SYSTEM Patent Application

Roger L. Kessinger, inventor (to NASA) (Martin Marietta Corp., Denver) Filed 8 Nov. 1976 26 p (Contract NAS9-14215) (NASA-Case-MSC-14916-1; US-Patent-Appl-SN-739914) Avail: NTIS HC A03/MF A01 CSCL 09C

A system for detecting malfunctions in electrical signal processing circuits is presented. Malfunctions of a hearing aid are detectable in the form of frequency distortion and/or inadequate amplification by the hearing aid amplifier, as well as weakening of the hearing aid power supply. A test signal is generated and a timed switching circuit periodically applies the test signal to the input of the hearing aid amplifier in place of the input signal from the microphone. The resulting amplifier output is compared with the input test signal used as a reference signal. The hearing aid battery voltage is also periodically compared to a reference voltage. A warning is triggered if the power supply voltage falls below the reference voltage. Author

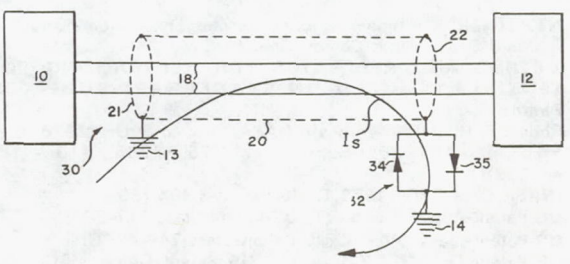


N77-13338*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

SHIELDED CONDUCTOR CABLE SYSTEM Patent Application

Kent D. Castle, inventor (to NASA) Filed 30 Nov. 1976 12 p (NASA-Case-MSC-12745-1; US-Patent-Appl-SN-746579) Avail: NTIS HC A02/MF A01 CSCL 09C

A method is described for circuit protection from abnormal surge voltages induced in a shielded cable. The 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 short circuited only 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. Author



N77-14333* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

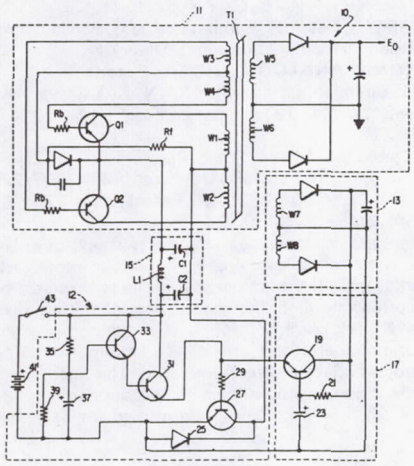
INRUSH CURRENT LIMITER Patent

Robert A. Kichak, inventor (to NASA) Issued 7 Dec. 1976 5 p Filed 6 Jan. 1975 Supersedes N75-16748 (13 - 08, p 0878)

(NASA-Case-GSC-11789-1; US-Patent-3,996,506; US-Patent-Appl-SN-538982; US-Patent-Class-321-13; US-Patent-Class-317-31) Avail: US Patent Office CSCL 09C

A circuit arrangement for limiting turn-on current inrush and current rate of rise in dc-to-dc power converters is considered. A transistor control circuit is disposed between the input dc power source and the transistor oscillator circuit of the converter to provide a ramp of current thereto. The transistor control circuit functions as a time-variable current limiter initially while in the active region and as a saturated switch in the steady-state region. A feedback arrangement allows the saturation drive current to be provided from the converter at a lower voltage level than that which may be required from the dc power source to reduce dissipation and increase efficiency.

Official Gazette of the U.S. Patent Office



N77-14334* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

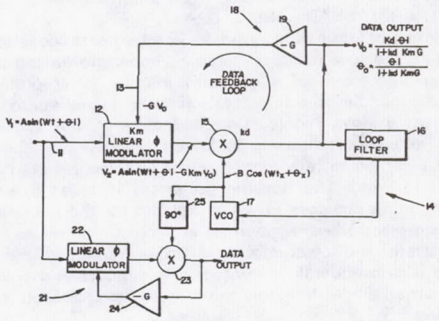
LINEAR PHASE DEMODULATOR INCLUDING A PHASE LOCKED LOOP WITH AUXILIARY FEEDBACK LOOP Patent

Ronnie R. Rippy, inventor (to NASA) Issued 14 Dec. 1976 8 p Filed 26 Nov. 1975 Supersedes N76-13169 (14 - 04, p 0416)

(NASA-Case-GSC-12018-1; US-Patent-3,997,848; US-Patent-Appl-SN-635531; US-Patent-Class-329-122; US-Patent-Class-329-124; US-Patent-Class-331-23; US-Patent-Class-331-36C; US-Patent-Class-332-30V) Avail: US Patent Office CSCL 09C

A phase modulated wave that may have no carrier power is demodulated by a phase locked loop including a phase detector for deriving an A.C. data output signal having a magnitude and a phase indicative of the phase of the modulated wave. A feedback loop responsive to the data output signal restores power to the carrier frequency component to the loop. In one embodiment, the feedback loop includes a phase modulator responsive to the phase modulated wave and the data output signal. In a second embodiment, carrier frequency power is restored by differentiating the data output signal and supplying the differentiated signal to an input of a voltage controlled oscillator included in the phase locked loop.

Official Gazette of the U.S. Patent Office



N77-14335* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

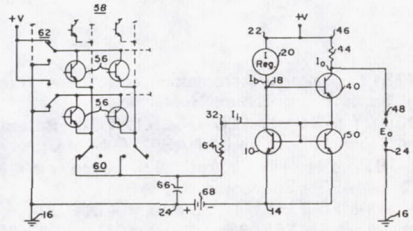
SOLID-STATE CURRENT TRANSFORMER Patent

David L. Farnsworth, inventor (to NASA) (Westinghouse Electric Corp., Baltimore) Issued 7 Dec. 1976 4 p Filed 23 Jun. 1975 Supersedes N75-26251 (13 - 17, p 2106) Sponsored by NASA

(NASA-Case-MFS-22560-1; US-Patent-3,996,462; US-Patent-Appl-SN-589233; US-Patent-Class-250-214A; US-Patent-Class-330-14; US-Patent-Class-330-28; US-Patent-Class-330-59) Avail: US Patent Office CSCL 09C

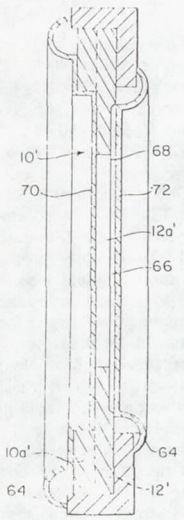
A signal transformation network which is uniquely characterized to exhibit a very low input impedance while maintaining a linear transfer characteristic when driven from a voltage source and when quiescently biased in the low microampere current range is described. In its simplest form, it consists of a tightly coupled two transistor network in which a common emitter input stage is interconnected directly with an emitter follower stage to provide virtually 100 percent negative feedback to the base input of the common emitter stage. Bias to the network is supplied via the common tie point of the common emitter stage collector terminal and the emitter follower base stage terminal by a regulated constant current source, and the output of the circuit is taken from the collector of the emitter follower stage.

Official Gazette of the U.S. Patent Office



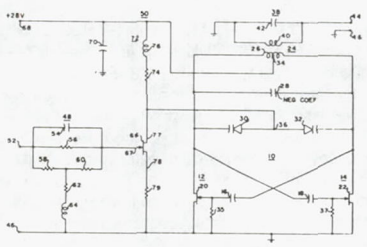
N77-15293*# National Aeronautics and Space Administration, Washington, D.C.
METHOD FOR PRODUCING THIN SURFACE BARRIER DIODE Patent Application
Karl Reinitz, inventor (to NASA) (APL, Laurel, Md.) Filed 24 Nov. 1976 15 p Sponsored by NASA
(NASA-Case-HQN-10887-1; US-Patent-Appl-SN-744575) Avail: NTIS HC A02/MF A01 CSCL 09A

A method of fabricating a thin surface barrier diode is provided which utilizes a low resistivity starting substrate having a frying pan shape comprised of a generally circular body portion and an elongate handle portion. After a high resistivity epitaxial layer is grown in a slow, highly controlled manner, the substrate is mounted in an inert housing in which selected portions of the high resistivity silicon are etched away and the resultant device cleaned and dried. The housing preferably includes a mounting block containing recesses in which holders for the substrate and the etching electrode are mounted in such a manner as to bring the substrate and electrode into proper registry. The etched substrate is subsequently mounted in a support and treated to form a barrier diode detector, the handle being etched away as a final step.
NASA



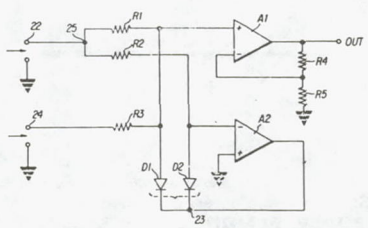
N77-17351* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
FREQUENCY MODULATED OSCILLATOR Patent
Martial A. Honnell, inventor (to NASA) (Auburn Univ., Ala.) Issued 11 Jan. 1977 5 p Filed 9 Apr. 1975 Supersedes N75-21518 (13 - 13, p 1499) Sponsored by NASA
(NASA-Case-MFS-23181-1; US-Patent-4,003,004;
US-Patent-Appl-SN-566495; US-Patent-Class-332-30V;
US-Patent-Class-331-114; US-Patent-Class-331-177V;
US-Patent-Class-332-18) Avail: US Patent Office CSCL 09A

A frequency modulated push-pull oscillator in which the non-linear characteristic of varactors producing frequency modulation is compensated for by an opposite non-linear characteristic of a field effect transistor providing modulating bias to the varactors is described.
Official Gazette of the U.S. Patent Office



N77-17354* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ELECTRONIC ANALOG DIVIDER Patent
Arthur G. Birchenough, inventor (to NASA) Issued 4 Jan. 1977 4 p Filed 24 Jul. 1975 Supersedes N75-28316 (13 - 19, p 2380)
(NASA-Case-LEW-11881-1; US-Patent-4,001,602;
US-Patent-Appl-SN-598968; US-Patent-Class-307-229;
US-Patent-Class-307-230; US-Patent-Class-328-161) Avail: US Patent Office CSCL 09C

Advantage is taken of the current-exponential voltage characteristic of a diode over a certain range whereby the incremental impedance across the diode is inversely proportional to the current through the diode. Accordingly, a divider circuit employs a bias current through the diode proportional to the desired denominator and applies an incremental current to the diode proportional to the numerator. The incremental voltage across the diode is proportional to the quotient.
Official Gazette of the U.S. Patent Office



N77-17357*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD OF ELECTRICALLY PRE-STRESSING INSULATION TO PROVIDE DIRECTIONAL INCREASE IN dc POTENTIAL BREAKDOWN Patent Application
Irving G. Hansen, inventor (to NASA) Filed 31 Jan. 1977 7 p
(NASA-Case-LEW-12273-1; US-Patent-Appl-SN-764253) Avail: NTIS HC A02/MF A01 CSCL 09C

A method was provided for electrically pre-stressing an insulator to increase the dc breakdown strength of the insulator in a given direction. The method comprises placing an uncured, durable insulating material, such as an epoxy resin, in an electric field and curing the insulating material while maintaining the field so as to capture an electric field within the insulating material. The electric field biasses the breakdown potential in a given direction so that the insulation is able to withstand a substantially greater dc operating voltage of the appropriate polarity. NASA

N77-17358*# National Aeronautics and Space Administration. Pasadena Office, Calif.

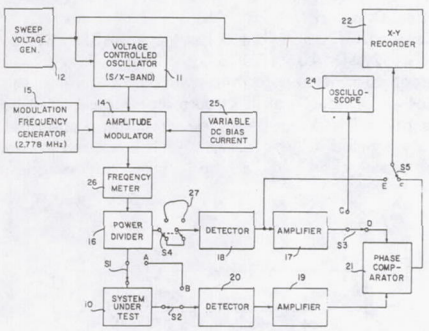
SWEPT GROUP DELAY MEASUREMENT Patent Application

David L. Trowbridge, inventor (to NASA) (JPL) Filed 24 Nov. 1976 14 p

(Contract NAS7-100)

(NASA-Case-NPO-13909-1; US-Patent-Appl-SN-744477) Avail: NTIS HC A02/MF A01 CSCL 09C

A method and apparatus for recording directly group delay measurement of a system under temperature and stress tests employing a modulated carrier frequency swept over an S or X band of interest is described and applied through a reference path and a test path to separate detectors for group delay measurement using a power divider, a directional coupler or a hybrid T junction. A phase comparator is initially balanced, and then the modulated carrier is swept in frequency over the band of interest for different conditions of temperature and/or mechanical stress to obtain a family of characteristics group delay curves for the system under test. NASA



N77-17359*# National Aeronautics and Space Administration. Pasadena Office, Calif.

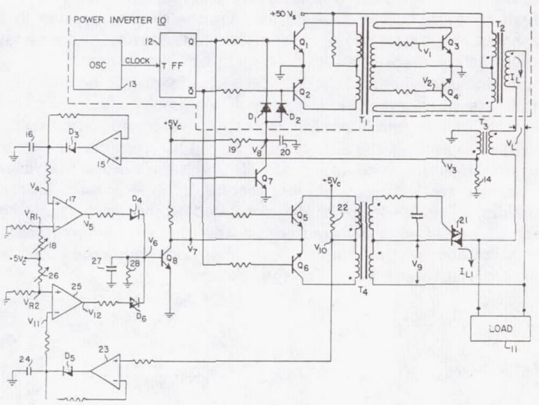
OVERLAOD PROTECTION SYSTEM FOR POWER INVERTER Patent Application

Satoshi Nagano, inventor (to NASA) (JPL) Filed 15 Nov. 1976 18 p

(Contract NAS7-100)

(NASA-Case-NPO-13872-1; US-Patent-Appl-SN-742034) Avail: NTIS HC A02/MF A01 CSCL 09C

An overload protection system for a power inverter utilizes a first circuit for monitoring current to the load from the power inverter to detect an overload and a control circuit to shut off the power inverter when an overload condition is detected. At the same time a monitoring current inverter is turned on to deliver current to the load at a very low power level. A second circuit monitors current to the load from the monitoring current inverter to hold the power inverter off through the control circuit until the overload condition is cleared so the control circuit may be deactivated in order for the power inverter to be restored after the monitoring current inverter is turned off completely. NASA



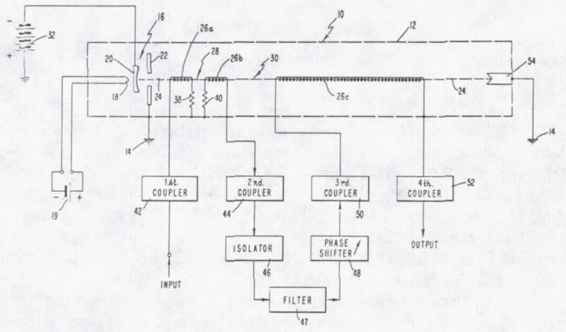
N77-17360*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

TRAVELING WAVE TUBE CIRCUIT Patent Application

Denis J. Connolly, inventor (to NASA) Filed 15 Feb. 1977 12 p

(NASA-Case-LEW-12013-1; US-Patent-Appl-SN-768795) Avail: NTIS HC A02/MF A01 CSCL 09C

The traveling wave tube (TWT) has a slow wave structure (SWS) which is severed into two or more sections. A signal path connects the end of an SWS section to the beginning of the following SWS section. The signal path comprises an impedance matching coupler (IMC), followed by an isolater, a phase correcting filter, a variable phase shifter, and a second IMC. The aggregate band pass characteristic of the components in the signal path is chosen to reject, or strongly attenuate, all frequencies outside the desired operating frequency range of the TWT and yet pass with minimal attenuation in the forward direction, all frequencies within the desired operating frequency range. NASA

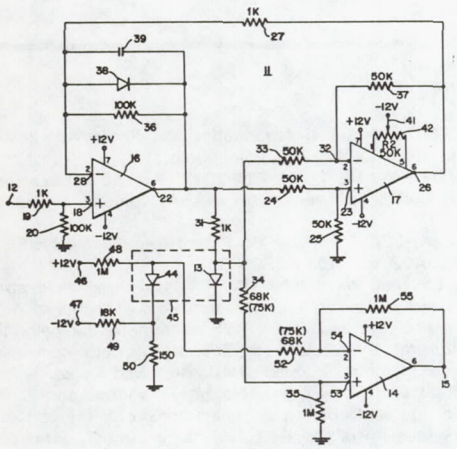


N77-19319*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

LOGARITHMIC CIRCUIT WITH WIDE DYNAMIC RANGE Patent Application

Paris H. Wiley (Va. Polytechnic Inst. and State Univ.) and Eugene A. Manus, inventors (to NASA) (Va. Polytechnic Inst. and State Univ.) Filed 16 Feb. 1977 15 p Sponsored by NASA (NASA-Case-GSC-12145-1; US-Patent-Appl-SN-769149) Avail: NTIS HC A02/MF A01 CSCL 09C

A circuit deriving an output voltage that is proportional to the logarithm of a dc input voltage, and is susceptible to wide variations in amplitude was fabricated. A constant current source which forward biases a diode so that the diode operates in the exponential portion of its voltage versus current characteristic, above its saturation current is included. The constant current source includes first and second, cascaded feedback, dc operational amplifiers connected in a negative feedback circuit. An input terminal of the first amplifier is responsive to the input voltage. A circuit shunting the first amplifier output terminal includes a resistor in series with the diode. The voltage across the resistor is sensed at the input of the second dc operational feedback amplifier. The feedback voltage derived from the output of the second amplifier is subtracted by the first amplifier from the input voltage so that the current flowing through the resistor is proportional to the input voltage. NASA

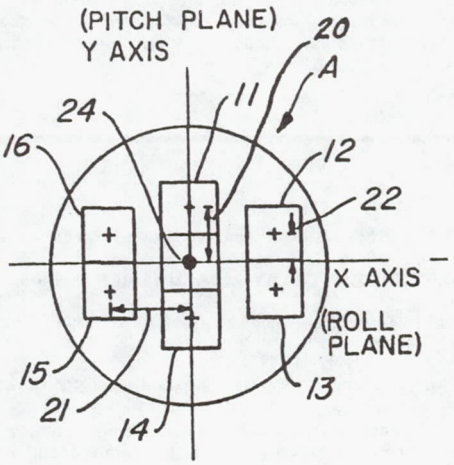


N77-19320*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

PHASE ARRAY ANTENNA CONTROL Patent Application

George D. Doland, inventor (to NASA) (Lockheed Electronics Co., Houston, Tex.) Filed 3 Feb. 1977 51 p (Contract NAS9-12200) (NASA-Case-MSC-14939-1; US-Patent-Appl-SN-765165) Avail: NTIS HC A04/MF A01 CSCL 09C

The present invention provides several improvements in steering and control of phased array antennas having a small number of elements, typically on the order of 5 to 17 elements. Among the improvements are increasing the number of beam steering positions, reducing the possibility of phase transients in signals received or transmitted with the antennas, and increasing control and testing capacity with respect to the antennas. Author

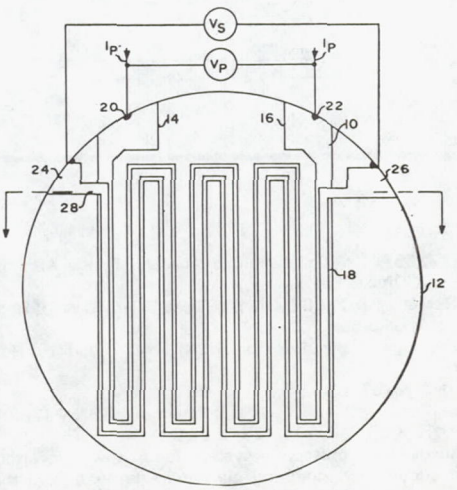


N77-20341*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

DIRECT CURRENT TRANSFORMER Patent Application

S. M. Khanna and Eugene W. Urban, inventors (to NASA) (NSF, Washington, D. C.) Filed 29 Mar. 1977 10 p (NASA-Case-MFS-23659-1; US-Patent-Appl-SN-782462) Avail: NTIS HC A02/MF A01 CSCL 09A

A direct current transformer was built in which the primary consists of an elongated strip of superconductive material, across the ends of which is applied a direct current potential. Parallel and closely spaced to the primary is positioned a transformer secondary consisting of a thin strip of magnetoresistive material. NASA

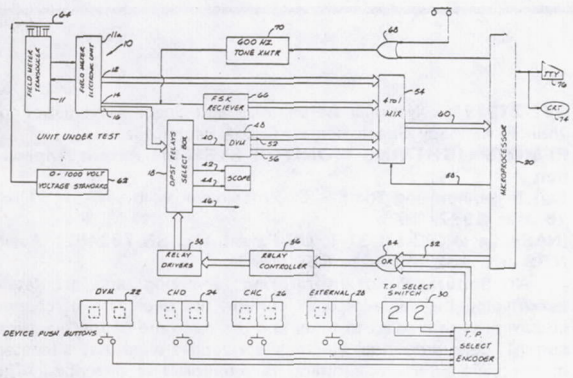


N77-20343*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

MICROCOMPUTERIZED ELECTRIC FIELD METER DIAGNOSTIC AND CALIBRATION SYSTEM Patent Application

Larry D. Holley and Jerry W. Mason, inventors (to NASA) (Federal Electric Corp., Paramus, N. J.) Filed 24 Mar. 1977 14 p (NASA-Case-KSC-11035-1; US-Patent-Appl-SN-780874) Avail: NTIS HC A02/MF A01 CSCL 09A

A method for rapid calibration of field meters used to measure electromagnetic field potential is described. A reference voltage is applied to the field meter for causing signals to be produced on the output terminals thereof. A bank of relays is provided for selectively connecting output terminals of the field meter to a multiplexer by means of a digital voltmeter and an oscilloscope. A frequency-shift-keyed receiver is also connected to one of the terminals of the field meter for transmitting and converting a frequency shift keyed signal to a digital signal which is, subsequently, applied to the multiplexer. A microprocessor generates coded command signals to the bank of relays and also to the multiplexer for controlling the comparison of the output signals with information stored within the microprocessor. NASA

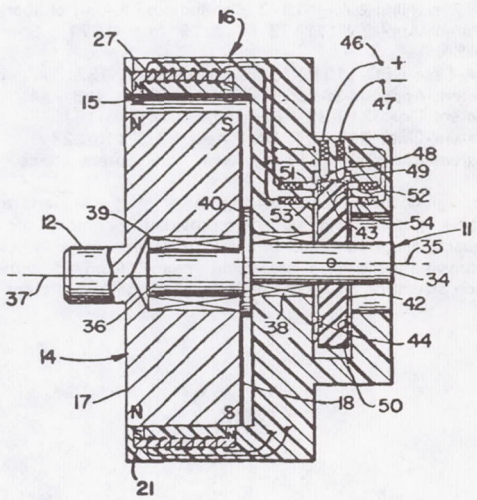


N77-20344*# National Aeronautics and Space Administration. Goddard Inst. for Space Studies, New York.

A ROTARY ELECTRIC DEVICE Patent Application

Jesse Madey, inventor (to NASA) Filed 21 Mar. 1977 21 p (NASA-Case-GSC-12138-1; US-Patent-Appl-SN-779871) Avail: NTIS HC A02/MF A01 CSCL 09A

An electric motor having an output shaft that rotates at a speed much slower than the speed of a commutation shaft comprises a stator having a cylindrical bore with a longitudinal axis and a rotor that carries the output shaft and rotates in the bore eccentrically about the axis so that there is contact and no magnetic gap between a relatively small portion of the rotor periphery and the periphery of the bore. A magnetic field, rotating at the speed of the commutation shaft, is applied to the periphery of the bore. The field has longitudinally extending magnetic field components of opposite polarity so that around approximately 180 deg of the bore the field extends in a first direction, while around the other 180 deg of the bore the field extends in the opposite direction. The rotor includes permanent magnet pole faces at opposite ends of the bore. The pole faces of the rotor are alternately attracted to and repulsed from different portions of the periphery of the bore as the magnetic field rotates about the periphery of the bore. NASA



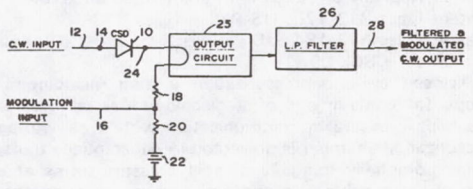
N77-21314* National Aeronautics and Space Administration. Pasadena Office, Calif.

CHARGE STORAGE DIODE MODULATORS AND DEMODULATORS Patent

Milton H. Brockman, inventor (to NASA) (JPL) Issued 1 Jun. 1971 9 p Filed 12 Jul. 1968 Sponsored by NASA (NASA-Case-NPO-10189-1; NASA-Case-NPO-10781-1; US-Patent-3,582,828; US-Patent-Appl-SN-744522; US-Patent-Class-332-16; US-Patent-Class-307-232; US-Patent-Class-307-238; US-Patent-Class-307-280; US-Patent-Class-329-119; US-Patent-Class-329-205; US-Patent-Class-332-30; US-Patent-Class-332-52) Avail: US Patent Office CSCL 09A

Circuits for the modulation or demodulation of radio frequency signals comprising a charge storage diode which provides a reverse current with a current-time integral equal to that of a forward current which has previously passed through the diode are presented. In the modulator circuit, the carrier signal is coupled to pass through the diode, while the modulating signal biases the diode to govern the phase at which it conducts. The diode output is phase- and amplitude-modulated. In the demodulator circuit, a constant radio frequency signal is coupled to pass through the diode, while the signal to be phase-demodulated biases the diode to govern the phase at which it conducts.

Official Gazette of the U.S. Patent Office

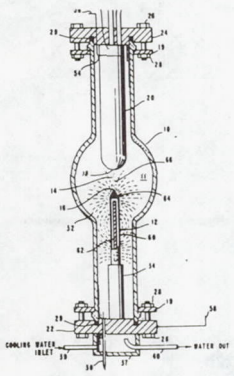


N77-21315* National Aeronautics and Space Administration. Pasadena Office, Calif.

COMPACT, HIGH INTENSITY ARC LAMP WITH INTERNAL MAGNETIC FIELD PRODUCING MEANS Patent

Charles G. Miller, inventor (to NASA) (JPL) Issued 29 Apr. 1975 7 p Filed 2 Aug. 1973 Continuation-in-part of abandoned US Patent-Appl-SN-173178, filed 19 Aug. 1971 Sponsored by NASA
(NASA-Case-NPO-11510-1; US-Patent-3,881,132; US-Patent-Appl-SN-385059; US-Patent-Class-315-344; US-Patent-Class-313-32; US-Patent-Class-313-161; US-Patent-Class-313-184; US-Patent-Class-313-224; US-Patent-Appl-SN-173178) Avail: US Patent Office CSCL 09A

A significant increase in brightness of the arc and a more focusable light-emitting region are provided in compact arc lamps by causing magnetic lines of force to diverge from the cathode tip from magnetic field producing means disposed within the cathode structure. Official Gazette of the U.S. Patent Office

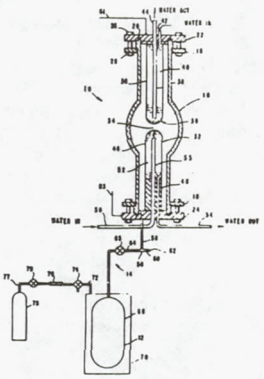


N77-21316* National Aeronautics and Space Administration. Pasadena Office, Calif.

DEPRESSURIZATION OF ARC LAMPS Patent

Charles G. Miller, inventor (to NASA) (JPL) Issued 16 Nov. 1971 8 p Filed 14 Jul. 1969 Sponsored by NASA
(NASA-Case-NPO-10790-1; US-Patent-3,621,330; US-Patent-Appl-SN-841278; US-Patent-Class-315-108; US-Patent-Class-313-175; US-Patent-Class-313-180; US-Patent-Class-313-184; US-Patent-Class-315-110) Avail: US Patent Office CSCL 09A

A closed cycle depressurization system including a lamp envelope for containment of a discharge gas at greater than atmospheric pressure in communication with a gas storage and depressurization chamber is presented. A substantially transparent material, potentially frangible at said pressure forms at least a portion of the envelope. In one embodiment, depressurization is effected by externally cooling the walls of the chamber and in a second embodiment, the chamber contains a gas adsorbent which adsorbs gas to reduce the pressure in the lamp envelope to the desired safe nonoperating level.
Official Gazette of the U.S. Patent Office

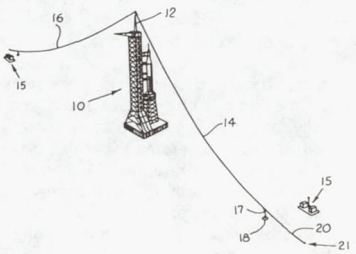


N77-21319*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

REMOTE LIGHTNING MONITOR SYSTEM Patent Application

Carl L. Lennon and Thomas O. Britt, inventors (to NASA) Filed 29 Mar. 1977 18 p
(NASA-Case-KSC-11031-1; US-Patent-Appl-SN-782482) Avail: NTIS HC A02/MF A01 CSCL 09C

An apparatus for monitoring, analyzing, and accurately determining the value of peak current, the peak rate of change in current with respect to time, and the rise time of the electrical currents generated in an electrical conductive mast that is located in the vicinity where lightning is monitored is described. The apparatus includes an electrical coil for sensing the change in current flowing through the mast and generating a voltage responsive. An on site recorder and a recorder control system records the voltages produced responsive to lightning strikes and converts the voltage to digital signals for being transmitted back to the remote command station responsive to command signals. The recorder and the recorder control system are carried within an RFI proof environmental housing into which the command signals are fed by means of a fiber optic cable so as to minimize electrical interference. NASA



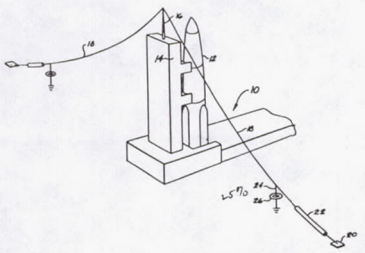
N77-21320*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

LIGHTNING CURRENT WAVEFORM MEASURING SYSTEM Patent Application

R. J. Wojtasinski, J. C. Fuchs (Federal Electric Corp., Paramus, N. J.), and C. Grove, inventors (to NASA) (Federal Electric Corp., Paramus, N. J.) Filed 30 Mar. 1977 16 p

(NASA-Case-KSC-11018-1; US-Patent-Appl-SN-782693) Avail: NTIS HC A02/MF A01 CSCL 09C

An apparatus for monitoring current waveforms produced by lightning strikes which generate currents in an elongated cable is described. These currents are converted to voltages and to light waves for being transmitted over an optical cable to a remote location. At the remote location, the waves are reconstructed back into electrical waves for being stored into a memory. The information is stored within the memory with a timing signal so that only different signals need to stored in order to reconstruct the wave form. NASA



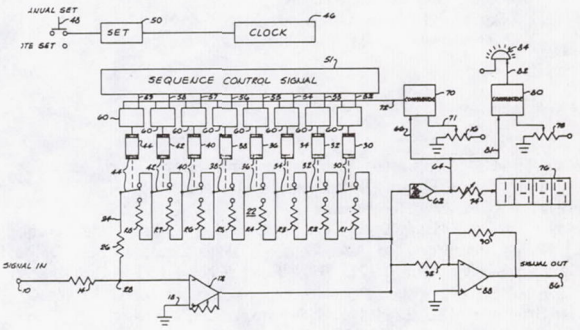
N77-21321*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

DIGITAL AUTOMATIC GAIN AMPLIFLIER Patent Application

Larry D. Holley and James O. Ward, inventors (to NASA) (Federal Electric Corp., Paramus, N. J.) Filed 24 Mar. 1977 13 p

(NASA-Case-KSC-11008-1; US-Patent-Appl-SN-780729) Avail: NTIS HC A02/MF A01 CSCL 09C

A circuit was made for adjusting the amplitude of a reference signal to a predetermined level to permit subsequent data signals to be interpreted correctly. The circuit includes an operational amplifier having a feedback circuit connected between an output terminal and an input terminal; a bank of relays operably connected to a plurality of resistors; and a comparator comparing an output voltage of the amplifier with a reference voltage and generating a compared signal responsive thereto. Means is provided for selectively energizing the relays according to the compared signal from the comparator until the output signal from the amplifier equals to the reference signal. A second comparator is provided for comparing the output of the amplifier with a second voltage source to illuminate a lamp when the output signal from the amplifier exceeds the second voltage. NASA



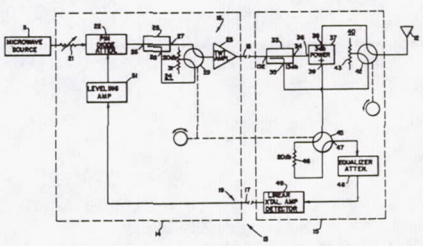
N77-21322*# National Aeronautics and Space Administration. Goddard Inst. for Space Studies, New York.

WIDE POWER RANGE MICROWAVE FEEDBACK CONTROLLER Patent Application

Leo E. Titus, inventor (to NASA) (Hughes Aircraft Co., Los Angeles) Filed 29 Mar. 1977 17 p Sponsored by NASA

(NASA-Case-GSC-12146-1; US-Patent-Appl-SN-782480) Avail: NTIS HC A02/MF A01 CSCL 09C

A microwave source of substantially constant amplitude drives a forward path connected between the source and the load. The forward path includes a voltage controlled, PIN diode, variable microwave attenuator. A feedback path responsive to the microwave power level in the forward path derives a control voltage for the PIN attenuator. The feedback path includes a microwave equalizer attenuator having an amplitude versus frequency response corresponding substantially with the amplitude versus frequency response of the load. The equalizer attenuator drives a linear, crystal amplitude detector. Attenuating means included in the forward and feedback paths are selectively connected in circuit to maintain the power level of the microwave input to the amplitude detector substantially constant, even though different power ranges are supplied to the load by the forward path. Author



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*.

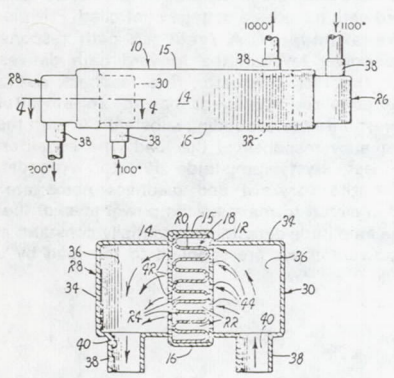
N77-10463* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

HEAT EXCHANGER Patent

Roy F. Holmes (Gen. Dyn./Convair, San Diego, Calif.) and Edward E. Keller, inventors (to NASA) (Gen. Dyn./Convair, San Diego, Calif.) Issued 5 Oct. 1976 5 p Filed 5 Nov. 1974 Supersedes N75-10366 (13 - 01, p 0049) Sponsored by NASA (NASA-Case-MFS-22991-1; US-Patent-3,983,933; US-Patent-Appl-SN-521006; US-Patent-Class-165-164; US-Patent-Class-165-170) Avail: US Patent Office CSCL 20D

An improved lightweight heat exchanger particularly suited for use in systems having low volume flow, high longitudinal gradient and high effectiveness requirements is described. The heat exchanger is characterized by a shell of an annular configuration, an endless plate of minimal thickness and of a substantially uniformly convoluted configuration disposed within the annular shell for defining a plurality of endless, juxtaposed passages, each having a low Reynold's number and being of an annular configuration. A pair of manifolds disposed 180 deg apart is mounted on the shell in communication with the passages through which counterflowing fluids are simultaneously introduced and extracted from the passageways for achieving a continuous transfer of heat through the convoluted plate.

Official Gazette of the U.S. Patent Office



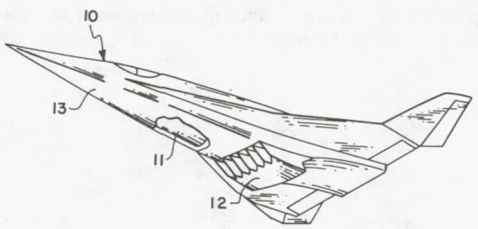
N77-12332*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

AUXILIARY POWER SYSTEM FOR ACTIVITY COOLED AIRCRAFT Patent Application

Robert A. Jones, inventor (to NASA) Filed 24 Nov. 1976 9 p (NASA-Case-LAR-11626-1; US-Patent-Appl-SN-744542) Avail: NTIS HC A02/MF A01 CSCL 20D

A method is described for extracting heat energy from an active cooling system in an aircraft as a source of auxiliary power. A secondary coolant such as a water-glycol mixture removes heat from near the outer surfaces of the vehicle and circulates through a heat exchanger. Cryogenic fuel such as liquid hydrogen is first pressurized and passed through the heat exchanger and a turbine on its way to the engine. The temperature of the fuel is raised in the heat exchanger to a value above that which is required for the engine, because the fuel temperature and pressure will drop across the turbine. The turbine converts this excess heat to provide energy to pressurize the fuel, circulate the secondary coolant and drive other aircraft equipment.

Author

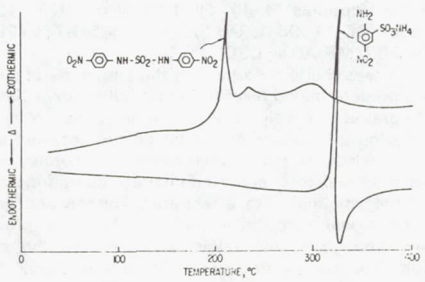


N77-14372*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

INTUMESCENT-ABLATOR COATINGS USING ENDOTHERMIC FILLERS Patent Application

Paul M. Sawko and Salvatore R. Riccitiello, inventors (to NASA) Filed 23 Dec. 1976 30 p (NASA-Case-ARC-11043-1; US-Patent-Appl-SN-753964) Avail: NTIS HC A03/MF A01 CSCL 20D

An improved intumescent composition is provided for insulating a substrate against heat which consists of a mixture of an endothermic filler with an intumescent composition which is composed of an intumescent agent and a polymeric binder system. The composition of the invention employs a filler such as ammonium oxlate, potassium fluoborate, ammonium fluoborate or zinc borate in combination with a base intumescent composition which contains 4,4-dinitrosulfanilide or the ammonium salt of 1,4-nitroaniline-2-sulfonic acid in a polymeric binder system. The endothermic characteristics of the filler moderate the heat emitted upon the thermal decomposition of the intumescent agent in an applied intumescent coating. NASA



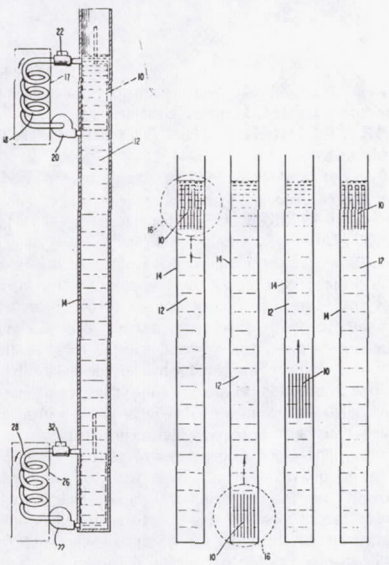
N77-15343*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

MAGNETIC HEAT PUMPING Patent Application

Gerald V. Brown, inventor (to NASA) Filed 30 Nov. 1976 21 p

(NASA-Case-LEW-12508-1; US-Patent-Appl-SN-746580) Avail: NTIS HC A02/MF A01 CSCL 20D

The magnetic heat pumping method employs ferromagnetic or ferrimagnetic elements, preferably a rare earth based material, such as gadolinium, and preferably employs a regenerator. The temperature and applied magnetic field of the element are controlled to cause the state of the element as represented on a temperature-magnetic entropy diagram repeatedly to traverse a loop. The loop may have a first portion of concurrent substantially isothermal or constant temperature and increasing applied magnetic field, a second portion of lowering temperature and constant applied magnetic field, a third portion of isothermal and decreasing applied magnetic field, and a fourth portion of increasing temperature and constant applied magnetic field. Other loops may be four-sided, with, for example, two isotherms and two adiabats (constant magnetic entropy portions). A regenerator may be employed to enhance desired cooling or heating effects, with varied magnetic fields or varying temperatures including three-sided figures traversed by the representative point. NASA



N77-18382* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

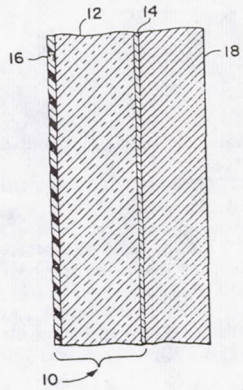
PARTICULATE AND SOLAR RADIATION STABLE COATING FOR SPACECRAFT Patent

Wayne S. Slemp, inventor (to NASA) Issued 15 Feb. 1977 4 p Filed 16 May 1975 Supersedes N75-29431 (13 - 20, p 2526) Continuation-in-part of abandoned US Patent Appl. SN-428992, filed 27 Dec. 1973

(NASA-Case-LAR-10805-2; US-Patent-4,008,348; US-Patent-Appl-SN-578240; US-Patent-Class-428-35; US-Patent-Class-428-421; US-Patent-Class-428-461; US-Patent-Class-428-474; US-Patent-Class-244-117A; US-Patent-Class-427-160; US-Patent-Class-427-322; US-Patent-Appl-SN-428992) Avail: US Patent Office CSCL 20D

A laminate thermal control coating for spacecraft comprising a layer of solar radiation stable film, a layer of particulate radiation stable film applied to the upper surface of the solar radiation stable film, and a layer of reflecting material applied to the lower surface of the solar radiation stable film was described. The coating experiences no increase in solar radiation absorptance (the proportion of radiant energy absorbed) upon exposure to particulate or solar radiation as the particulate radiation is substantially absorbed in the particulate radiation stable layer and the solar radiation partially absorbed by the particulate radiation stable layer is transmitted by the solar radiation stable film to the reflecting material which reflects it back through the laminate and into space.

Official Gazette of the U.S. Patent Office



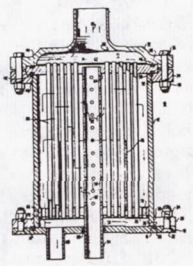
N77-19353* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

TUBULAR SUBLIMATORY EVAPORATOR HEAT SINK Patent

Bruce W. Webbon, inventor (to NASA) Issued 15 Feb. 1977 6 p Filed 16 Oct. 1975 Supersedes N76-13599 (14 - 04, p 0471)

(NASA-Case-ARC-10912-1; US-Patent-4,007,601; US-Patent-Appl-SN-623187; US-Patent-Class-62-100; US-Patent-Class-62-121; US-Patent-Class-62-269; US-Patent-Class-62-315) Avail: US Patent Office CSCL 20D

An evaporative refrigerator or cooler comprising a bundle of spaced, porous walled tubes closed at one of their ends and vented to a vacuum at the other end is disclosed. The tube bundle is surrounded by a water jacket having a hot water inlet distribution manifold and a cooled water outlet through a plenum chamber. Hot water is pumped into the jacket to circulate around the tubes, and when this water meets the vacuum existing inside the tubes, it evaporates thereby cooling the water in the jacket. If cooling proceeds to the point where water penetrating or surrounding all or part of the tubes freezes, operation continues with local sublimation of the ice on the tubes while the circulating water attempts to melt the ice. Both sublimation and evaporation may take place simultaneously in different regions of the device. *Official Gazette of the U.S. Patent 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*.

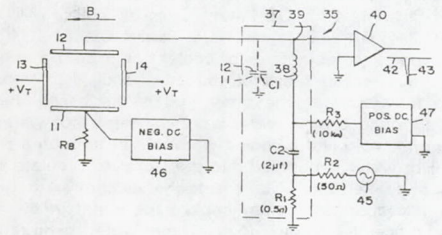
N77-10492* National Aeronautics and Space Administration. Pasadena Office, Calif.

ION AND ELECTRON DETECTOR FOR USE IN AN ICR SPECTROMETER Patent

Wesley T. Huntress, inventor (to NASA) (JPL) Issued 5 Oct. 1976 8 p Filed 27 Aug. 1974 Supersedes N74-32890 (12 - 22, p 2695) Published under the second Trial Voluntary Protest Program as B 500, 981, 27 Jan. 1976 Sponsored by NASA (NASA-Case-NPO-13479-1; US-Patent-3,984,681; US-Patent-Appl-SN-500981; US-Patent-Class-250-291; US-Patent-Class-250-290) Avail: US Patent Office CSCL 14B

A detector for detecting ions and/or electrons present in a resonance cell of an ICR spectrometer is disclosed. The detector which operates on the Q-meter principle is driven by an external rf oscillator capable of providing rf frequencies up to about 15MHz at an adjustable low rf signal level, e.g., below 20mV. The detector is connected across the resonance of the cell to detect ions by detecting their cyclotron frequency. Electrons are detectable by connecting the detector across the cell's trapping plates and thereby detect the electrons' trapping motion, the frequency of which is in the megahertz range.

Official Gazette of the U.S. Patent Office



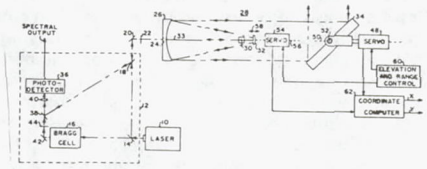
N77-10493* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

FOCUSED LASER DOPPLER VELOCIMETER Patent

James W. Bilbro, Werner K. Dahm, Ronald B. Campbell, Jr. (Raytheon Co., Huntsville, Ala.), Robert M. Huffaker, Harold B. Jeffreys, Albert V. Jelalian (Raytheon Co., Huntsville, Ala.), Wayne H. Keene (Raytheon Co., Huntsville, Ala.), Michael C. Krause (LMSC Huntsville, Ala.), Thomas R. Lawrence (LMSC, Huntsville, Ala.), Charles M. Sonnenschein, inventors (to NASA) (Raytheon Co., Huntsville, Ala.) et al Issued 5 Oct. 1976 7 p Filed 3 Dec. 1975 Supersedes N76-13459 (14 - 04, p 0454) (NASA-Case-MFS-23178-1; US-Patent-3,984,686; US-Patent-Appl-SN-637247; US-Patent-Class-250-339; US-Patent-Class-250-338; US-Patent-Class-250-347; US-Patent-Class-356-106R) Avail: US Patent Office CSCL 14B

A system for remotely measuring velocities present in discrete volumes of air is described. A CO2 laser beam is focused by a telescope at such a volume, a focal volume, and within the focusable range, near field, of the telescope. The back scatter, or reflected light, principally from the focal volume, passes back through the telescope and is frequency compared with the original frequency of the laser, and the difference frequency or frequencies represent particle velocities in that focal volume.

Official Gazette of the U.S. Patent Office



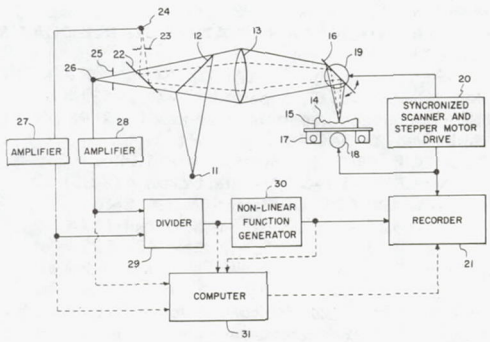
N77-10497*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

DEVICE FOR MEASURING THE CONTOUR OF A SURFACE Patent Application

Ernest E. Burcher and Stephen Katzberg, inventors (to NASA) Filed 8 Nov. 1976 10 p (NASA-Case-LAR-11869-1; US-Patent-Appl-SN-740155) Avail: NTIS HC A02/MF A01 CSCL 14B

A device for measuring the contour of a surface is considered. Light from a source is imaged by a lens onto the surface which concentrates the energy from the source into a spot. A scanning means is used to scan the spot across the surface. As the surface is being scanned the surface moves relative to the point of perfect focus. When the surface moves away from perfect focus the spot increases in size, while the total energy in the spot remains virtually constant. The lens then reimages the light reflected by the surface onto two detectors through two different sized apertures. The light energy going to the two detectors is separated by a beam splitter. This second path of the light energy through the lens further defocuses the spot, but as a result of the different sizes of the apertures in each light detector path, the amount of defocus for each is different. The ratio of the outputs of the two detectors which is indicative of the contour of the surface is obtained by a divider.

NASA



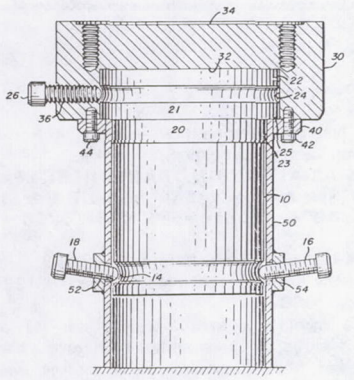
N77-10498*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ROTARY LEVELING BASE PLATFORM Patent Application

Robert W. Delaplaine and Daniel L. Mossolani, inventors (to NASA) Filed 3 Nov. 1976 8 p

(NASA-Case-ARC-10981-1; US-Patent-Appl-SN-738218) Avail: NTIS HC A02/MF A01 CSCL 14B

A leveling apparatus for the precise level adjustment of a scientific instrument is analyzed. A base member is provided having a hollow cylindrical shape. A table for supporting the instrument rests on the base and has a shaft portion extending below the table. The upper portion of the shaft fits tightly into the hollow portion of the base member whereas the lower portion of the shaft is machined to fit loosely. The lower portion of the shaft is provided with a groove cut around the circumference thereof. Adjusting screws are threaded through the hollow cylindrical portion and are adapted to enter the groove. By adjusting the screws, the lower portion of the shaft is moved in a vertical plane since the shaft which is loosely fitted into the cylinder. The upper portion of the shaft which is tightly fitted into the upper end of the cylinder causes the cylinder to deform slightly providing a fulcrum point which allows the table to be leveled in response to the adjustment of the adjusting screws. NASA



N77-11363*# National Aeronautics and Space Administration. Pasadena Office, Calif.

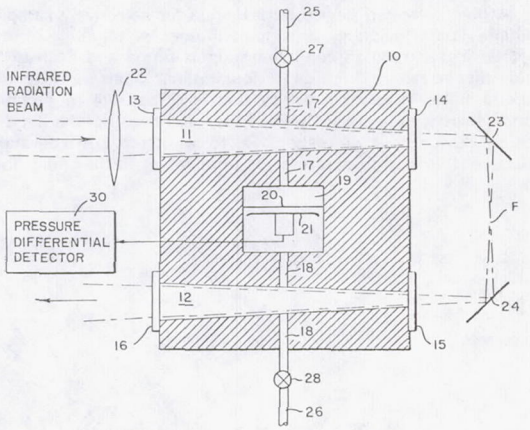
DIFFERENTIAL OPTOACOUSTIC ABSORPTION DETECTOR Patent Application

Michael S. Shumate, inventor (to NASA) (JPL) Filed 27 Aug. 1976 18 p

(Contract NAS7-100)

(NASA-Case-NPO-13759-1; US-Patent-Appl-SN-718266) Avail: NTIS HC A02/MF A01 CSCL 14B

A differential optoacoustic absorption detector employs two tapered cells in tandem or in parallel. When operating in tandem, two mirrors are used at one end remote from the source of the beam of light directed into one cell back through the other, and a lens to focus the light beam into the one cell at a principal focus half way between the reflecting mirrors. Each cell is tapered to conform to the shape of the beam so that the volume of one is the same as for the other, and the volume of each receives maximum illumination. The axes of the cells are placed as close to each other as possible in order to connect a differential pressure detector to the cells with connecting passages of minimum length. An alternative arrangement employs a beam splitter and two lenses to operate the cells in parallel. NASA



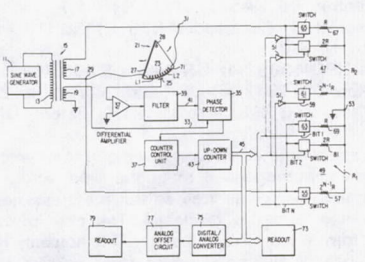
N77-11364*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ANGLE DETECTOR Patent Application

Gilbert T. Parra, inventor (to NASA) Filed 10 Nov. 1976 16 p

(NASA-Case-ARC-11036-1; US-Patent-Appl-SN-740457) Avail: NTIS HC A02/MF A01 CSCL 14B

An angle detector for determining a transducer's angular disposition to a capacitive pickup element is described. The transducer comprises a pendulum mounted inductive element moving past the capacitive pickup element. The capacitive pickup element divides the inductive element into two parts L sub 1 and L sub 2 which form the arms of one side of an a-c bridge. Two networks R sub 1 and R sub 2 having a plurality of binary weighted resistors and an equal number of digitally controlled switches for removing resistors from the networks form the arms of the other side of the a-c bridge. A binary counter, controlled by a phase detector, balances the bridge by adjusting the resistance of R sub 1 and R sub 2. The binary output of the counter is representative of the angle. NASA



35 INSTRUMENTATION AND PHOTOGRAPHY

N77-13391*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

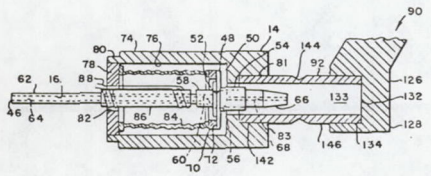
FLUID SAMPLING DEVICE Patent Application

David K. Studenick, inventor (to NASA) Filed 19 Nov. 1976 24 p

(NASA-Case-GSC-12143-1; US-Patent-Appl-SN-743249) Avail: NTIS HC A02/MF A01 CSCL 14B

A fluid sampling device is described for selectively sampling multiple fluids including a support frame. A plurality of fluid inlet devices extend through the support frame and each of the fluid inlet devices include a longitudinal aperture extending therethrough. An opening device that is responsive to a control signal selectively opens the aperture for passing the fluid. A closing device that is responsive to another control signal selectively closes the aperture for terminating further fluid flow.

Author



N77-14406* National Aeronautics and Space Administration. Pasadena Office, Calif.

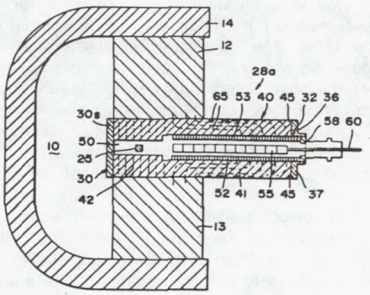
MASS SPECTROMETER WITH MAGNETIC POLE PIECES PROVIDING THE MAGNETIC FIELDS FOR BOTH THE MAGNETIC SECTOR AND AN ION-TYPE VACUUM PUMP Patent

Leonard M. Sieradski (JPL), Charles E. Giffin (JPL), and Alfred O. Nier, inventors (to NASA) (JPL) Issued 7 Dec. 1976 8 p Filed 21 Nov. 1975 Supersedes N76-13456 (14 - 04, p 0453) Sponsored by NASA

(NASA-Case-NPO-13663-1; US-Patent-3,996,464; US-Patent-Appl-SN-634205; US-Patent-Class-250-289; US-Patent-Class-250-298) Avail: US Patent Office CSCL 14B

A mass spectrometer (MS) with unique magnetic pole pieces which provide a homogenous magnetic field across the gap of the MS magnetic sector as well as the magnetic field across an ion-type vacuum pump is disclosed. The pole pieces form the top and bottom sides of a housing. The housing is positioned so that portions of the pole pieces form part of the magnetic sector with the space between them defining the gap region of the magnetic sector, through which an ion beam passes. The pole pieces extend beyond the magnetic sector with the space between them being large enough to accommodate the electrical parts of an ion-type vacuum pump. The pole pieces which provide the magnetic field for the pump, together with the housing form the vacuum pump enclosure or housing.

Official Gazette of the U.S. Patent Office



N77-14407* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

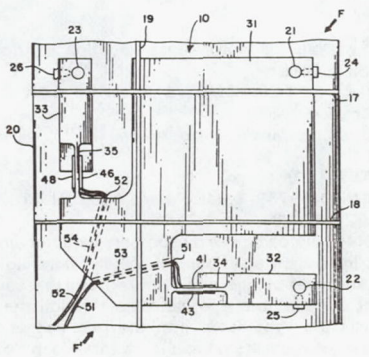
MINIATURE BIAXIAL STRAIN TRANSDUCER Patent

Ira S. Hoffman, inventor (to NASA) Issued 7 Dec. 1976 6 p Filed 30 Dec. 1975 Supersedes N76-16396 (14 - 07, p 0847)

(NASA-Case-LAR-11648-1; US-Patent-3,995,476; US-Patent-Appl-SN-645571; US-Patent-Class-73-133R) Avail: US Patent Office CSCL 14B

A reusable miniature strain transducer for use in the measurement of static or quasi-static, high level, biaxial strain on the surface of test specimens or structures was studied. Two cantilever arms, constructed by machining the material to appropriate flexibility, are self-aligning and constitute the transducing elements of the device. Used in conjunction with strain gages, the device enables testing beyond normal gage limits for high strains and number of load cycles. The device does not require conversion computations since the electrical output of the strain gages is directly proportional to the strain measured.

Official Gazette of the U.S. Patent Office



N77-14408* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

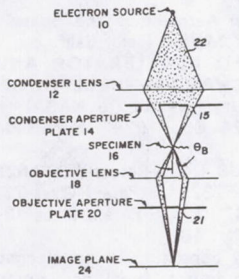
ELECTRON MICROSCOPE APERTURE SYSTEM Patent

Klaus Heinemann, inventor (to NASA) (NAS-NRC) Issued 7 Dec. 1976 6 p Filed 23 Jul. 1973 Supersedes N74-12191 (12 - 03, p 0293) Continuation-in-part of abandoned US Patent Appl. SN-221670, filed 28 Jan. 1972 Sponsored by NASA

(NASA-Case-ARC-10448-3; US-Patent-3,996,468; US-Patent-Appl-SN-318848; US-Patent-Class-250-396; US-Patent-Appl-SN-221670) Avail: US Patent Office CSCL 14B

An electron microscope including an electron source, a condenser lens having either a circular aperture for focusing a solid cone of electrons onto a specimen or an annular aperture for focusing a hollow cone of electrons onto the specimen, and an objective lens having an annular objective aperture, for focusing electrons passing through the specimen onto an image plane are described. The invention also entails a method of making the annular objective aperture using electron imaging, electrolytic deposition and ion etching techniques.

Official Gazette of the U.S. Patent Office



N77-14409* National Aeronautics and Space Administration. Pasadena Office, Calif.

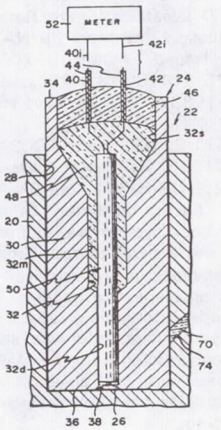
THERMOCOUPLE INSTALLATION Patent

Walter B. Powell (JPL), Lee R. Potter (JPL), and Kenton S. MacDavid, inventors (to NASA) (JPL) Issued 7 Dec. 1976 8 p Filed 22 Nov. 1974 Supersedes N75-12276 (13 - 03, p 0297) Sponsored by NASA

(NASA-Case-NPO-13540-1; US-Patent-3,996,070; US-Patent-Appl-SN-526450; US-Patent-Class-136-233; US-Patent-Class-136-232) Avail: US Patent Office CSCL 14B

A thermocouple assembly which includes a plug having a pair of small diameter holes near one end thereof which are spaced a small distance apart to leave a thin quantity of plug material between the holes is presented. There are a pair of thermocouple wires extending through the different holes and with the outer ends of the wires joined to the thin quantity of plug material which lies between the holes to form a thermocouple junction.

Official Gazette of the U.S. Patent Office



N77-14411* National Aeronautics and Space Administration. Pasadena Office, Calif.

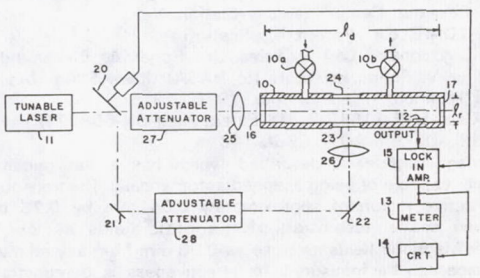
METHOD AND APPARATUS FOR BACKGROUND SIGNAL REDUCTION IN OPTO-ACOUSTIC ABSORPTION MEASUREMENT Patent

Lars-Goeran Rosengren, inventor (to NASA) (JPL) Issued 7 Dec. 1976 5 p Filed 25 Jul. 1975 Supersedes N75-29383 (13 - 30, p 2520) Sponsored by NASA

(NASA-Case-NPO-13683-1; US-Patent-3,995,960; US-Patent-Appl-SN-599284; US-Patent-Class-356-204; US-Patent-Class-250-343; US-Patent-Class-356-97; US-Patent-Class-356-201) Avail: US Patent Office CSCL 14B

The sensitivity of an opto-acoustic absorption detector is increased to make it possible to measure trace amounts of constituent gases. A second beam radiation path is created through the sample cell identical to a first path except as to length, alternating the beam through the two paths and minimizing the detected pressure difference for the two paths while the beam wavelength is tuned away from the absorption lines of the sample. Then with the beam wavelength tuned to the absorption line of any constituent of interest, the pressure difference is a measure of trace amounts of the constituent. The same improved detector may also be used for measuring the absorption coefficient of known concentrations of absorbing gases.

Official Gazette of the U.S. Patent Office



N77-17426* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

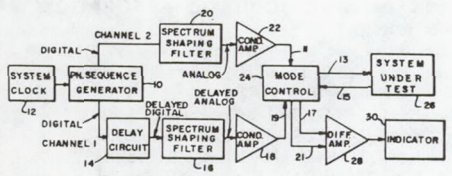
METHOD OF AND MEANS FOR TESTING A TAPE RECORD/PLAYBACK SYSTEM Patent

Gabriel R. Wallace, William E. Salter (Sperry Rand Corp., Huntsville, Ala.), Glenn D. Weathers (Sperry Rand Corp., Huntsville, Ala.), and Sidney S. Gussow, inventors (to NASA) (Sperry Rand Corp., Huntsville, Ala.) Issued 11 Jan. 1977 6 p Filed 25 Mar. 1975 Supersedes N75-31418 (13 - 22, p 2787) Division of US Patent Appl. SN-419831, filed 28 Nov. 1973, US Patent-3,875,500

(NASA-Case-MFS-22671-2; US-Patent-4,003,084; US-Patent-Appl-SN-561956; US-Patent-Class-360-31; US-Patent-Class-360-25; US-Patent-Appl-SN-419831; US-Patent-3,875,500) Avail: US Patent Office CSCL 14B

A tape record/playback system was tested by first deriving an analog test signal and a band-limited digital reference signal from a pseudo-noise sequence generator driven by a clock signal. It recorded the signals on respective tracks of the system during operation in a record mode. During the playback mode of operation of the system, a delayed analog reference signal without time base variations was reconstructed from the played back reference signal. It was compared with the played back test signal in order to obtain an error signal that was a measure of the performance of the system.

Official Gazette of the U.S. Patent Office



N77-17430*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

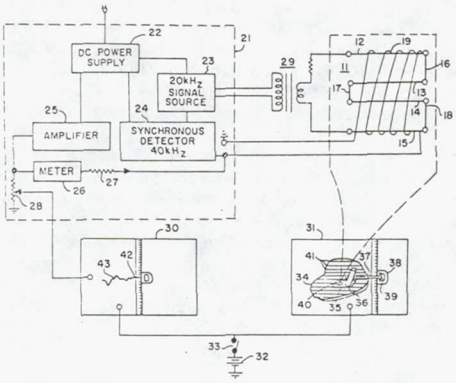
MAGNETOMETER Patent Application

William J. Debnam, Carl L. Fales, Jr., Roger A. Breckenridge, and Arthur V. Pohm, inventors (to NASA) (Iowa State Univ. of Sci. and Technol.) Filed 19 Mar. 1976 13 p

(NASA-Case-LAR-11617-2; US-Patent-Appl-SN-668771) Avail: NTIS HC A02/MF A01 CSCL 14B

A magnetometer is described which has a flat miniature transducer capable of being scanned automatically. The transducer has an active region of approximately 0.64 mm by 0.76 mm with good spatial resolution of magnetic fields as low as 0.02 oe. Magnetic fields as close as 0.08 mm from any relatively flat surface can be measured. Its effectiveness is demonstrated in determining the presence of magnetic remanence in the magnetic strap keepers on memory planes of experimental and production line plated-wire memories, and in measuring the transverse magnetic field components at the surface of geological rock specimens.

NASA



N77-18417* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

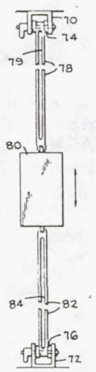
SPRING OPERATED ACCELERATOR AND CONSTANT FORCE SPRING MECHANISM THEREFOR Patent

George L. Shillinger, Jr., inventor (to NASA) Issued 15 Feb. 1977 10 p Filed 24 Oct. 1975 Supersedes N76-11441 (14 - 02, p 0190)

(NASA-Case-ARC-10898-1; US-Patent-4,007,623; US-Patent-Appl-SN-625732; US-Patent-Class-73-12; US-Patent-Class-73-432SD; US-Patent-Class-73-71.6) Avail: US Patent Office CSCL 14B

A spring assembly consisting of an elongate piece of flat spring material formed into a spiral configuration and a free running spool in circumscribing relation to which this spring is disposed was developed. The spring has a distal end that is externally accessible so that when the distal end is drawn along a path, the spring unwinds against a restoring force present in the portion of the spring that resides in a transition region between a relatively straight condition on the path and a fully wound condition on the spool. When the distal end is released, the distal end is accelerated toward the spool by the force existing at the transition region which force is proportional to the cross-sectional area of the spring.

Official Gazette of the U.S. Patent Office



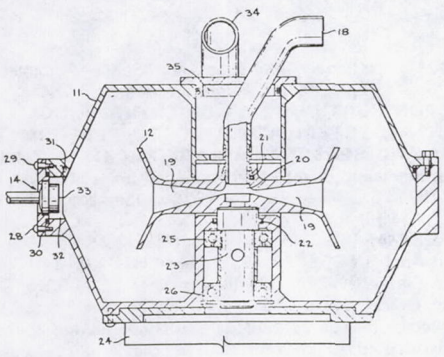
N77-19385* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

FLUID MASS SENSOR FOR A ZERO GRAVITY ENVIRONMENT Patent

G. L. Fogal, inventor (to NASA) (GE Corp., Philadelphia) Issued 2 Nov. 1976 5 p Filed 7 Nov. 1974 Sponsored by NASA (NASA-Case-MSC-14653-1; US-Patent-3,988,933; US-Patent-Appl-SN-521816; US-Patent-Class-73-432R; US-Patent-Class-177-1; US-Patent-Class-177-208) Avail: US Patent Office CSCL 14B

A sensor for measuring the mass of fluids, is described which includes a housing having an inlet and outlet for receiving and dumping the fluid, a rotary impeller within the housing for imparting centrifugal motion to the fluid and a pressure sensitive transducer attached to the housing to sense the rotating fluid pressure. The fluid may be drawn into the housing by entrainment within a gas stream. The resulting mixture is then separated into two phases: gas and liquid. The gas is removed from the housing and the pressure of the liquid, under centrifugal motion, is sensed and correlated with the mass of the fluid.

Official Gazette of the U.S. Patent Office

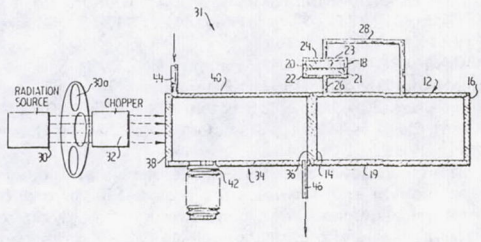


N77-19388*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

OPTICALLY SELECTIVE, ACOUSTICALLY RESONANT GAS DETECTING TRANSDUCER Patent Application

John Dimeff, inventor (to NASA) Filed 22 Dec. 1975 14 p (NASA-Case-ARC-10639-1; US-Patent-Appl-SN-643043) Avail: NTIS HC A02/MF A01 CSCL 14B

A gas analyzer is disclosed which responds to the resonant absorption or emission spectrum of a specific gas by producing an acoustic resonance in a chamber containing a sample of the gas. The device measures the amount of emission or absorption by measuring the strength of the acoustic resonance, e.g., the maximum periodic pressure, velocity or density achieved. In the preferred embodiment, a light beam is modulated periodically at the acoustical resonance frequency of a closed chamber which contains an optically dense sample of the gas of interest. Periodic heating of the gas by the light beam causes a cyclic expansion, movement, and pressure within the gas. The amplitude of the excursions increases until an amplitude is reached where the increased losses involving the amplified motions, compressions and thermal cycles are just sufficient to account for the cyclic radiation energy received through the window. A differential pressure converts the pressure variations of the resonant gas into electronic readout signals. NASA

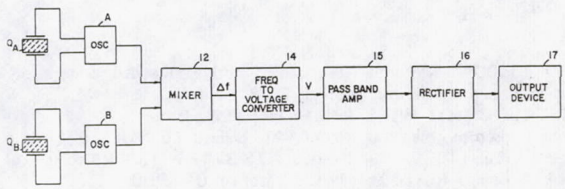


N77-19390*# National Aeronautics and Space Administration. Pasadena Office, Calif.

PASSIVE INTRUSION DETECTION SYSTEM Patent Application

Eric G. Laue, inventor (to NASA) (JPL) Filed 9 Feb. 1977 12 p (Contract NAS7-100) (NASA-Case-NPO-13804-1; US-Patent-Appl-SN-766999) Avail: NTIS HC A02/MF A01 CSCL 14B

An intrusion detection system is disclosed in which crystal oscillators are used to provide a frequency which varies as a function of fluctuations of a particular environmental property of the atmosphere, e.g., humidity, in the protected volume. The system is based on the discovery that the frequency of an oscillator whose crystal is humidity sensitive varies within a known frequency band if an intruder enters the protected volume. The variable frequency is converted into a voltage which is then filtered by a method which permits only voltage variations at frequencies within the known frequency band to activated an alarm. The system inhibits alarm activation when the voltage frequency is below or above the known frequency band. Author



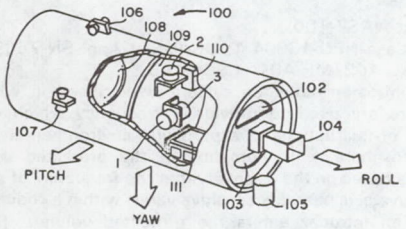
N77-20399* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ALL SKY POINTING ATTITUDE CONTROL SYSTEM Patent

Kenneth R. Lorell and James P. Murphy, inventors (to NASA) Issued 15 Mar. 1977 11 p Filed 4 Oct. 1973 Supersedes N73-32784 (11 - 23, p 2851)
(NASA-Case-ARC-10716-1; US-Patent-4,012,018; US-Patent-Appl-SN-403695; US-Patent-Class-244-165; US-Patent-Class-235-150.2; US-Patent-Class-235-150.25; US-Patent-Class-244-3.21; US-Patent-Class-244-171) Avail: US Patent Office CSCL 14B

In a strapped-down gyroscope space vehicle attitude control system, a method and apparatus are provided for gyro drift and input axis misalignment error compensation employing a sun and a star tracker and preselected vehicle calibration maneuvers. The outputs of two-axis strapped-down gyroscopes nominally aligned with the optical axis of the sun and star trackers are measured to provide gyro drift calibration, roll, pitch and yaw axis scale factors and values corresponding to the degree of nonorthogonality between the roll axis and the pitch and yaw gyro input axes and the nonorthogonality of the roll and pitch axes relative to the yaw axis. The vehicle is then rolled and yawed through precomputed angles as modified by the calibrated data stored in a digital computer, and acquires a target without recourse to external references.

Official Gazette of the U.S. Patent Office



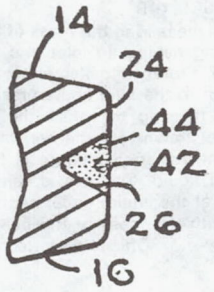
N77-20400* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

METALLIC HOT WIRE ANEMOMETER Patent

Fred R. Lemos, inventor (to NASA) Issued 15 Mar. 1977 6 p Filed 5 Sep. 1975 Supersedes N75-32426 (13 - 23, p 2918)
(NASA-Case-ARC-10911-1; US-Patent-4,011,756; US-Patent-Appl-SN-610802; US-Patent-Class-73-204; US-Patent-Class-338-28) Avail: US Patent Office CSCL 14B

A hot wire anemometer is described which has a body formed of heat resistant metal such as an alloy high in nickel content which supports a probe wire disposed in a V groove in the body. The V groove contains a high temperature ceramic adhesive that partially encompasses the downstream side of the probe wire. Mechanical and electrical connection to the probe wire is achieved through conductive support rods that are constructed of the same high temperature metal, insulation between the body and the conductor rods being provided by a coating of an oxide of the same material which coating is formed in situ. The oxide coating insulates the conductor rods from the body, mechanically fixes the conductors within the body, and maintains its integrity at elevated temperatures.

Official Gazette of the U.S. Patent Office



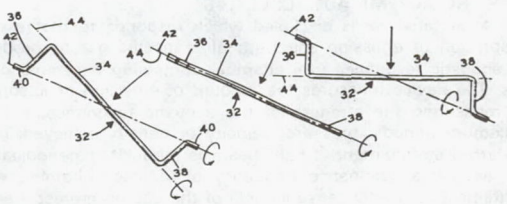
N77-20401* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

MOUNT FOR CONTINUOUSLY ORIENTING A COLLECTOR DISH IN A SYSTEM ADAPTED TO PERFORM BOTH DIURNAL AND SEASONAL SOLAR TRACKING Patent

Lott W. Brantley and Billy D. Lawson, inventors (to NASA) Issued 15 Mar. 1977 5 p Filed 29 Jan. 1976 Supersedes N76-18679 (14 - 09, p 1153)
(NASA-Case-MFS-23267-1; US-Patent-4,011,854; US-Patent-Appl-SN-653422; US-Patent-Class-126-270; US-Patent-Class-126-271; US-Patent-Class-250-203R) Avail: US Patent Office CSCL 14B

A collector dish is continuously oriented toward the sun in a system adapted to perform both diurnal and seasonal solar tracking. The mount is characterized by a rigid, angulated axle having a linear midportion supporting a collector dish, and oppositely extended end portions normally related to the midportion of the axle and received in spaced journals. The longitudinal axis of symmetry for the midportion of the axle is coincident with a seasonal axis while the axes of the journals are coincident with a diurnal axis paralleling the earth's polar axis. Drive means are provided for periodically displacing the axle about the diurnal axis at a substantially constant rate, while other drive means are provided for periodically indexing the dish through 1 deg about the seasonal axis whereby the position of the dish relative to the axle is varied for accommodating seasonal tracking as changes in the angle of inclination of the polar axis occurs.

Official Gazette of the U.S. Patent Office



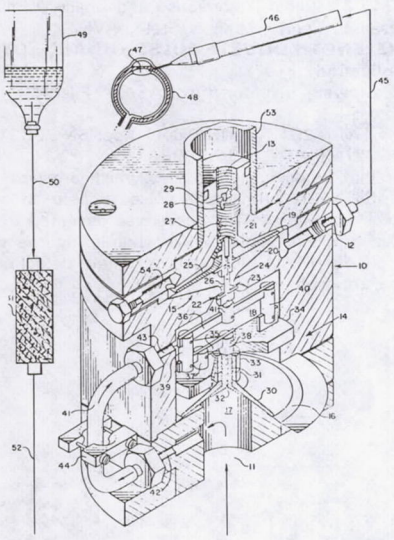
N77-20408*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

FLOW COMPENSATING PRESSURE REGULATOR Patent Application

Edward F. Baehr, inventor (to NASA) Filed 21 Mar. 1977 10 p

(NASA-Case-LEW-12718-1; US-Patent-Appl-SN-779428) Avail: NTIS HC A02/MF A01 CSCL 14B

An apparatus for regulating pressure of treatment fluid being supplied to a human or animal eye during ophthalmic procedures such as cataract surgery is disclosed. Flow sensing and pressure regulating diaphragms are provided in a body to modulate a flow control valve. The pressure regulating diaphragm is connected to the flow control valve to open the valve. The flow sensing diaphragm is mechanically connected to the flow control valve and opens it because of the differential pressure on the diaphragm generated by a flow of incoming treatment fluid through an orifice in the diaphragm. A bypass connection with a variable restriction is connected in parallel relationship to the orifice to provide for adjusting the sensitivity of the flow sensing diaphragm. NASA

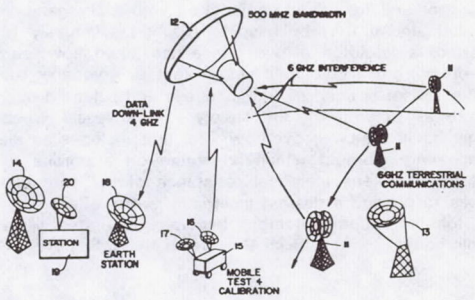


N77-20410*# National Aeronautics and Space Administration. Goddard Inst. for Space Studies, New York.

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

Gustave J. Schaefer, inventor (to NASA) (Hughes Aircraft Co, Los Angeles) Filed 24 Mar. 1977 50 p Sponsored by NASA (NASA-Case-GSC-12147-1; US-Patent-Appl-SN-780873) Avail: NTIS HC A03/MF A01 CSCL 14B

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. NASA



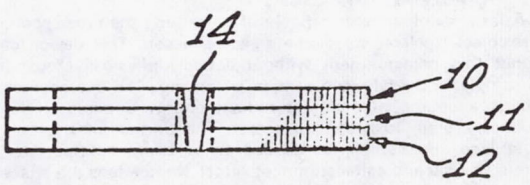
N77-21392* National Aeronautics and Space Administration. Pasadena Office, Calif.

ELECTROMAGNETIC TRANSDUCER RECORDING HEAD HAVING A LAMINATED CORE SECTION AND TAPERED GAP Patent

Norman I. Holt, inventor (to NASA) (JPL) Issued 10 Oct. 1972 6 p Filed 24 Jul. 1969 Sponsored by NASA (NASA-Case-NPO-10711-1; US-Patent-3,697,705; US-Patent-Appl-SN-844315; US-Patent-Class-179-100.2C) Avail: US Patent Office CSCL 14B

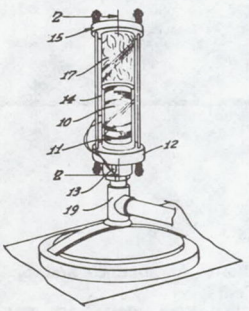
An electromagnetic transducer head is provided which exhibits a wide band recording response characteristic, which comprises a plurality of separate magnetic head structures operating over different, overlapping frequency bands, and formed into an integral assembly. Each separate head structure of the assembly includes a magnetic core, and each core is provided with a gap. The cores are positioned adjacent one another so that the gaps are aligned to define a common gap, and the recording medium is drawn across the common gap. The common gap is tapered, with the gap width of each aligned gap section being different from its adjacent section. Separate windings are wound about the cores, each having different numbers of turns so as to cover overlapping frequency ranges.

Official Gazette of the U.S. Patent Office



N77-21393* National Aeronautics and Space Administration. Pasadena Office, Calif.
CRYOGENIC LIQUID SENSOR Patent
Wallis M. Tener, inventor (to NASA) (JPL) Issued 12 Jan. 1971 5 p Filed 3 Sep. 1968 Sponsored by NASA
(NASA-Case-NPO-10619-1; US-Patent-3,555,483; US-Patent-Appl-SN-757017; US-Patent-Class-338-25) Avail: US Patent Office CSCL 14B

A sensor unit for use in conjunction with a cryogenic vessel is provided, and it may be used to respond selectively to the presence of a liquid in a two phase gas/liquid flow, such as the overflow from a cryogenic vessel vent or cryogenic transfer tube. The sensor is used to trigger relays and solenoid operated valves, so as to shut off the supply to the vessel when the cryogenic liquid starts to overflow. The unit includes an electric resistance wire element which is wound on a porous tubular support member. The electrical resistance of the wire element decreases to provide a desired electrical control effect when the porous tubular support member becomes saturated with the cryogenic liquid. Official Gazette of the U.S. Patent Office

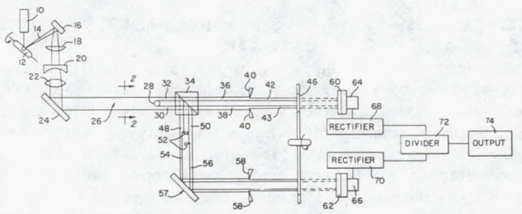


36 LASERS AND MASERS

Includes parametric amplifiers.

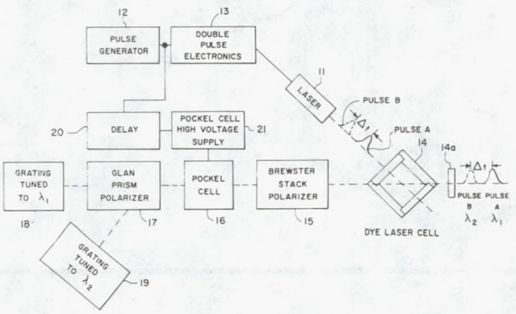
N77-10516*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
LASER EXTENSOMETER Patent Application
Phillip J. Stocker (Rocketdyne, Canoga Park, Calif.) and Harris L. Marcus, inventors (to NASA) (Rocketdyne, Canoga Park, Calif.) Filed 15 Oct. 1976 10 p Sponsored by NASA
(NASA-Case-MFS-19259-1; US-Patent-Appl-SN-732630) Avail: NTIS HC A02/MF A01 CSCL 20E

A laser extensometer capable of measuring the cross section of an object, such as its diameter is discussed. This device can conduct this measurement without actually physically touching said sample, and while said sample is moving. The extensometer contains a source of coherent radiant energy directed through an optics system to a sample object. The portion of the beam not striking the sample is divided by a beam splitter into a reference signal and a measurement signal. Knife edges are spaced apart a distance larger than the dimensions of the sample and create beams carrying information of the beam intensity. Knife edges are disposed in the path of both the reference and measurement signal for trimming the signals to eliminate non-uniform fringes. Each signal passes into a separate photodetector, and are divided by a divider giving an output which is a function of the sample shadow. NASA



N77-10517*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
TWO WAVELENGTH DOUBLE PULSE TUNABLE DYE LASER Patent Application
Edward V. Browell, inventor (to NASA) Filed 3 Nov. 1976 11 p
(NASA-Case-LAR-12012-1; US-Patent-Appl-SN-738219) Avail: NTIS HC A02/MF A01 CSCL 20E

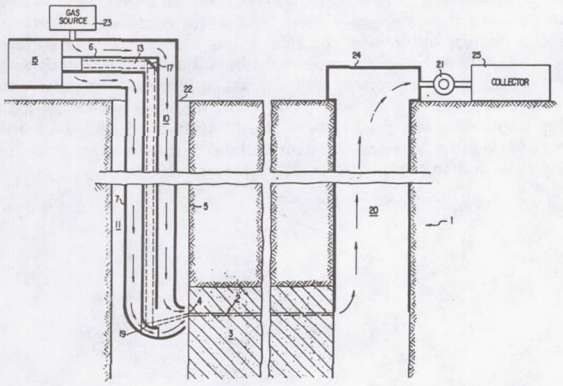
A laser that produces two pulses which are less than 500 microseconds apart with each pulse tunable to a different wavelength is considered. This laser was designed to eliminate several basic problems which arise when using the differential absorption LIDAR (DIAL) technique in remote detection of trace gases in the atmosphere. NASA



N77-18429*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IN-SITU LASER RETORTING OF OIL SHALE Patent Application
Harvey S. Bloomfield, inventor (to NASA) Filed 28 Jan. 1977 15 p
(NASA-Case-LEW-12217-1; US-Patent-Appl-SN-763753) Avail: NTIS HC A02/MF A01 CSCL 20E

Oil shale formations were retorted in-situ and gaseous hydrocarbon products recovered by drilling two or more wells into an oil shale formation. After fracturing a region of oil shale formation by directing a high energy laser beam into one of the wells and focussing the laser beam into a region of oil shale formation from a laser optical system, compressed gas was forced

into the well which supports combustion in the flame front ignited by laser beam, thereby retorting the oil shale and recovering gaseous hydrocarbon products which permeate through the fractured oil shale from one of the auxiliary wells. Author



N77-19416* National Aeronautics and Space Administration. Pasadena Office, Calif.

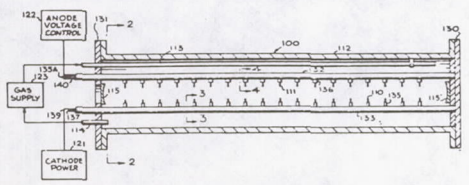
CONTINUOUS PLASMA LASER Patent

Willard F. Libby (Calif. Univ., Los Angeles), Carl A. Jensen (Calif. Univ., Los Angeles), and Lowell L. Wood, inventors (to NASA) (Calif. Univ., Los Angeles) Issued 8 Feb. 1977 10 p Filed 10 Aug. 1971 Supersedes N72-21693 (10 - 12, p 1646) Division of US Patent Appl. SN-866442, filed 14 Oct. 1969, US Patent-3,617,804, which is a continuation-in-part of Abandoned US Patent Appl. SN-479357, filed 12 Aug. 1965 Sponsored by NASA

(NASA-Case-XNP-04167-3; US-Patent-4,007,430; US-Patent-Appl-SN-170544; US-Patent-Class-331-94.5D; US-Patent-Class-331-94.5G; US-Patent-Class-331-94.5PE; US-Patent-Appl-SN-479357) Avail: US Patent Office CSCL 20E

The apparatus includes a housing for confining a gas at subatmospheric pressure and including a set of reflectors defining an optical cavity. At least one anode and cathode are positioned within the gas. First control means control the voltage applied to the anode and second control means independently control the temperature of the cathode. The pressure of the gas is controlled by a third control means. An intense monochromatic output is achieved by confining the gas in the housing at a controlled pre-determined reduced pressure, independently controlling the temperature of the electron emitting cathode and applying predetermined controlled low voltage to the anode.

Official Gazette of the U.S. Patent Office



N77-19418*# National Aeronautics and Space Administration. Pasadena Office, Calif.

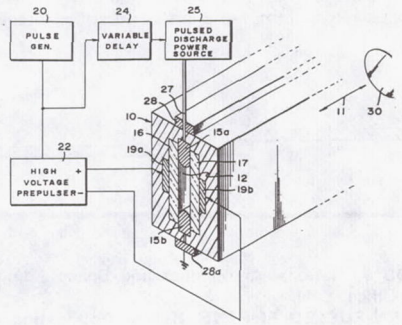
CHARGE TRANSFER REACTION LASER WITH PREIONIZATION MEANS Patent Application

James B. Laudenslager (JPL) and Thomas J. Pacala, inventors (to NASA) (JPL) Filed 12 Jul. 1976 24 p

(Contract NAS7-100)

(NASA-Case-NPO-13945-1; US-Patent-Appl-SN-704180) Avail: NTIS HC A02/MF A01 CSCL 20E

A helium-nitrogen laser is described in which energy in the visible range is emitted as a result of charge transfer reaction between helium ions and nitrogen molecules. The helium and nitrogen are present in a gas mixture at several atmospheres pressure, with a nitrogen partial pressure on the order of less than one percent. Prior to applying a discharge pulse to the gas mixture at the high pressure by means of a pair of main discharge electrodes, the gas mixture is preionized to prevent arcing when the discharge pulse is applied. NASA



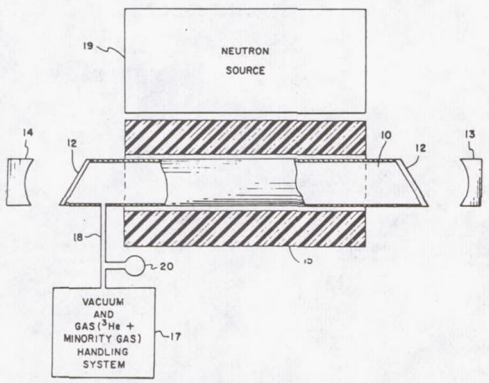
N77-21424*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

VOLUMETRIC DIRECT NUCLEAR PUMPED LASER Patent Application

Nelson W. Jalufka, Frank Hohl, Russell J. DeYoung (Vanderbilt Univ.), and Michael D. Williams, inventors (to NASA) Filed 19 Apr. 1977 12 p

(NASA-Case-LAR-12183-1; US-Patent Appl-SN788704) Avail: NTIS HC A02/MF A01 CSCL 20E

A volumetric direct nuclear pumped laser was developed in which the gas is a mixture of 3He and a minority gas from the group of argon, krypton, xenon, chlorine, nd fluorine. The mixture of 3He and the minority gas produces lasing with a minority gas concentration of from 0.01 to 10 percent argon, 1 percent krypton, 0.01 to 5 percent xenon and small concentrations of chlorine or fluorine. Author



37 MECHANICAL ENGINEERING

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

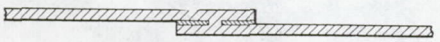
N77-11397* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

WELD-BONDED TITANIUM STRUCTURES Patent

Robert W. Vaughan (TRW Systems Group, Redondo Beach, Calif.) and John F. Creedon, inventors (to NASA) (TRW Systems Group, Redondo Beach, Calif.) Issued 26 Oct. 1976 5 p Filed 2 Jan. 1975 Sponsored by NASA

(NASA-Case-LAR-11549-1; US-Patent-3,988,561; US-Patent-Appl-SN-537979; US-Patent-Class-219-92; US-Patent-Class-219-118) Avail: US Patent Office CSCL 13M

Structurally stronger titanium articles are produced by a weld-bonding technique comprising fastening at least two plates of titanium together using spotwelding and curing an adhesive interspersed between the spot-weld nuggets. This weld-bonding may be employed to form lap joints or to stiffen titanium metal plates. Author



N77-11398*# National Aeronautics and Space Administration. Pasadena Office, Calif.

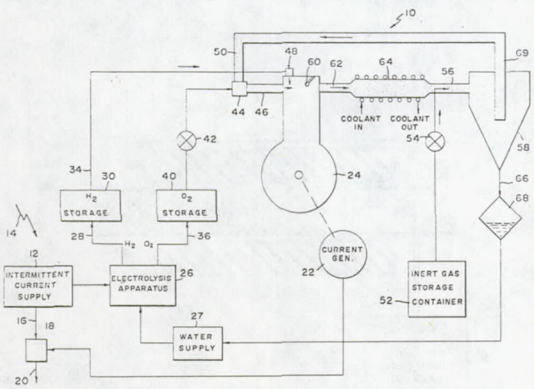
HYDROGEN-FUELED ENGINE Patent Application

Eugene A. Laumann (JPL) and Rollin K. Reynolds, inventors (to NASA) (JPL) Filed 27 Aug. 1976 14 p

(Contract NAS7-100)

(NASA-Case-NPO-13763-1; US-Patent-Appl-SN-718268) Avail: NTIS HC A02/MF A01 CSCL 21A

A hydrogen-oxygen fueled internal combustion engine is described herein, which utilizes an inert gas, such as argon, as a working fluid to increase the efficiency of the engine, eliminate pollution, and facilitate operation of a closed cycle energy system. In a system where sunlight or other intermittent energy source is available to separate hydrogen and oxygen from water, the oxygen and inert gas are taken into a diesel engine into which hydrogen is injected and ignited. The exhaust is cooled so that it contains only water and the inert gas. The inert gas in the exhaust is returned to the engine for use with fresh oxygen, while the water in the exhaust is returned to the intermittent energy source for reconversion to hydrogen and oxygen. NASA



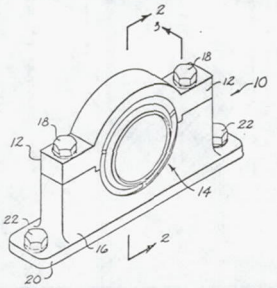
N77-11403*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SPHERICAL BEARING Patent Application

William N. Myers and Leopold A. Hein, inventors (to NASA) Filed 29 Oct. 1976 16 p

(NASA-Case-MFS-23447-1; US-Patent-Appl-SN-736909) Avail: NTIS HC A02/MF A01 CSCL 13I

Components of the invention include an inner ball having an opening for receiving a shaft and a spherical outer surface, and a circular outer race including a plurality of circumferentially spaced sections extending around the inner ball for snugly receiving the inner ball. A groove extends circumferentially around the race producing a thin wall portion there below which permits the opposed side portions to flex relative to the ball for maximizing the physical contact between the inner surface of the race and the spherical outer surface of the ball. NASA



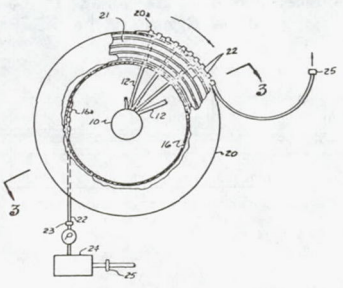
N77-12402* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

MECHANICAL THERMAL MOTOR Patent

Leopold A. Hein and William N. Myers, inventors (to NASA) Issued 26 Oct. 1976 8 p Filed 30 Jun. 1975 Supersedes N75-27561 (13 - 18, p 2276)

(NASA-Case-MFS-23062-1; US-Patent-3,987,630; US-Patent-Appl-SN-591569; US-Patent-Class-60-527) Avail: US Patent Office CSCL 13I

An apparatus is described for converting thermal energy such as solar energy into mechanical motion for driving fluid pumps and similar equipment. The thermal motor comprises an inner concentric cylinder carried by a stationary core member. The core member has a cylindrical disc plate fixed adjacent to a lower portion and extending radially from it. An outer concentric cylinder rotatably carried on the disc plate defining a space between the inner and outer concentric cylinders. A spiral tubular member encircles the inner concentric cylinder and is contained within the space between the inner and outer cylinders. One portion is connected to the inner concentric cylinder and a second portion connected to the outer concentric cylinder. A heated fluid is conveyed through the tubular member and is periodically cooled causing the tubular member to expand and contract. This causes the outer concentric cylinder to reciprocally rotate on the base plate accordingly. The reciprocating motion of the outer concentric cylinder is then utilized to drive a pump member in a pump chamber. Official Gazette of the U.S. Patent Office



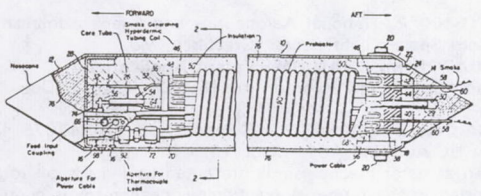
N77-13418* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SMOKE GENERATOR Patent

James R. Rogers, inventor (to NASA) Issued 9 Nov. 1976 11 p Filed 1 Oct. 1975 Supersedes N75-33278 (13 - 24, p 3031)

(NASA-Case-ARC-10905-1; US-Patent-3,990,987; US-Patent-Appl-SN-618594; US-Patent-Class-252-359A; US-Patent-Class-219-300; US-Patent-Class-219-304; US-Patent-Class-239-171) Avail: US Patent Office CSCL 13K

A smoke generator is disclosed which is particularly suitable for mounting on the wing tips of an aircraft and for conducting airflow studies. The device includes a network of thermally insulated tubes for carrying a fluid which is used to produce smoke. The fluid, which need not be combustible, is heated above its vaporization temperature by electric current which is passed through the fluid conduit tubes, so that the tubes serve both as fluid conduits and resistance heating elements. Fluid supply and monitoring systems and electrical control systems are also disclosed. Official Gazette of the U.S. Patent Office

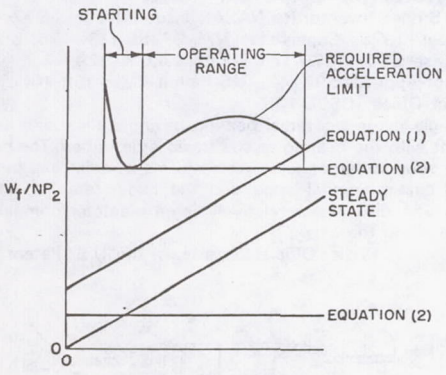


N77-13426*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

AUTOMOTIVE GAS TURBINE FUEL CONTROL Patent Application

H. S. Gold, inventor (to NASA) Filed 8 Nov. 1976 28 p (NASA-Case-LEW-12785-1; US-Patent-Appl-SN-739909) Avail: NTIS HC A03/MF A01 CSCL 21E

A fuel control useful for automotive-type gas turbines and particularly advanced gas turbines utilizing variable geometry components to improve mileage and reduce pollution emission is disclosed. The fuel control described compensates for fuel density variations, inlet temperature variations, turbine vane actuation, acceleration, and turbine breaking. These parameters are utilized to control various orifices, spool valves and pistons in a desired manner. NASA



N77-14477* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

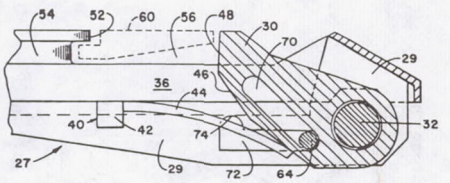
FIFTH WHEEL Patent

William P. Albrecht and Ralph H. Sparks, inventors (to NASA) Issued 7 Dec. 1976 9 p Filed 22 Jul. 1975 Supersedes N75-29432 (13 - 20, p 2526)

(NASA-Case-FRC-10081-1; US-Patent-3,995,877; US-Patent-Appl-SN-598504; US-Patent-Class-280-432) Avail: US Patent Office CSCL 13I

An improved fifth wheel for a tractor trailer rig, characterized by a first subassembly including a wear plate was developed and modified to be mounted on a downwardly facing surface of a trailer. A king pin projected normally therefrom, and a second subassembly is adapted to be pivotally mounted on an upwardly facing surface of a tractor. The king pin is brought into contiguous relation with the first sub assembly. A receiver for capturing the king pin is included along with a safety means responsive to a failure of the king pin or its latching mechanism for joing the first subassembly with the second subassembly.

Official Gazette of the U.S. Patent Office



N77-14478* National Aeronautics and Space Administration. *Langley Research Center, Langley Station, Va.*

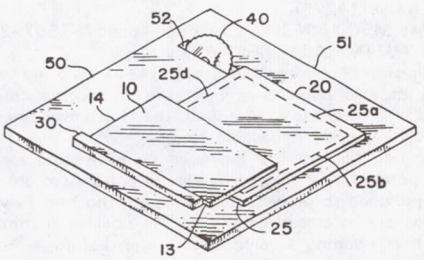
PRECISION ALINEMENT APPARATUS FOR CUTTING A WORKPIECE Patent

Morriss L. Holliday, inventor (to NASA) Issued 7 Dec. 1976 4 p Filed 24 Oct. 1975 Supersedes N76-13494 (14 - 04, p 0458)

(NASA-Case-LAR-11658-1; US-Patent-3,995,522; US-Patent-Appl-SN-625759; US-Patent-Class-83-467R; US-Patent-Class-83-451) Avail: US Patent Office CSCL 13I

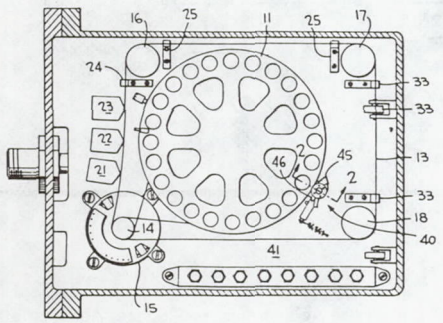
A fixture is removably fixed to a workpiece providing a temporary reference edge positioned parallel to a reference line and a known distance from a reference point. The temporary reference edge in cooperation with a guide and a cutting blade of a cutting table enables the workpiece to be accurately cut with respect to the reference line and reference point without first having to cut a reference edge on the workpiece.

Official Gazette of the U.S. Patent Office



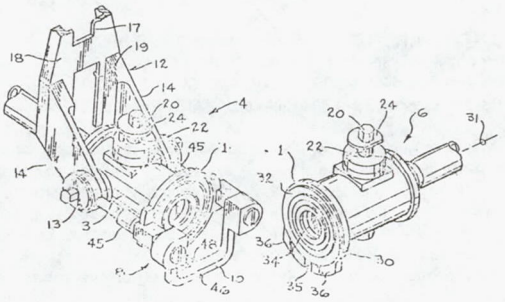
N77-14479* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
REEL SAFETY BRAKE Patent
Clinton E. Carle, inventor (to NASA) Issued 7 Dec. 1976 9 p Filed 6 Nov. 1975 Supersedes N76-13495 (14 - 04, p 0459)
(NASA-Case-GSC-11960-1; US-Patent-3,995,789; US-Patent-Appl-SN-629456; US-Patent-Class-242-193; US-Patent-Class-242-57; US-Patent-Class-242-187; US-Patent-Class-242-204; US-Patent-Class-242-210) Avail: US Patent Office CSCL 13I

A braking apparatus is described for a tape transport device having two stacked coaxial reels and feelers mounted in proximity to the reels for sensing the tape being wound on each reel. A device is mounted in proximity to adjacent central hubs of the reels to a simultaneously, frictionally engage both hubs and brake both reels. A mechanical actuator is coupled to both feelers and to the brake device. The brake means comprises a pair of rubber shoulders that extend in opposite directions relative to a common axis, and turns about the axis in response to either of the feelers. Official Gazette of the U.S. Patent Office



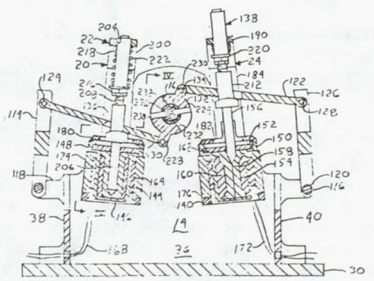
N77-15397*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
POSITIVE ISOLATION DISCONNECT Patent Application
Morley V. Friedell, inventor (to NASA) (Martin Marietta Corp., Denver) Filed 15 Dec. 1976 18 p
(Contract NAS9-14376)
(NASA-Case-MSC-16043-1; US-Patent-Appl-SN-750792) Avail: NTIS HC A02/MF A01 CSCL 13K

A disconnect composed basically of two halves each consisting of a poppet valve operable to isolate fluid with essentially zero fluid loss is described. The two halves are coupled together by a quickly releasable coupling, which may be either a coupling ring tightened or loosened by a twisting motion, or a clamp operated by a pivoted handle. In either case an interlock device is provided to prevent disconnecting the two halves until both valves are in closed condition. The positive feature of the device is one requiring a valve closing step before a disconnect step, and takes structural form in an eccentric lobe mounted on the valve operating stem. If some obstruction prevents the poppet from moving to its seat, the eccentric lobe cannot be rotated to the closed position, and the interlock prevents a disconnect.
NASA



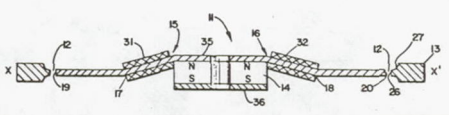
N77-15400*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ACTUATOR MECHANISM Patent Application
William C. Stange, inventor (to NASA) Filed 6 Dec. 1976 28 p
(NASA-Case-GSC-11883-2; US-Patent-Appl-SN-747675) Avail: NTIS HC A03/MF A01 CSCL 13I

An actuator mechanism is presented having a shaft rotatably supported in the frame. A positioning mechanism is coupled to the shaft for rotating the shaft in two rotary positions disposed approximately 180 deg apart. A pair of plungers are coupled to the shaft, each of which is responsive to a control signal for applying bi-directional rotation to the shaft respectively. NASA



N77-17464* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MAGNETIC BEARING SYSTEM Patent
Philip A. Studer, inventor (to NASA) Issued 4 Jan. 1977 13 p Filed 3 Jul. 1975 Supersedes N75-27386 (13 - 18, p 2256)
(NASA-Case-GSC-11978-1; US-Patent-4,000,929; US-Patent-Appl-SN-593142; US-Patent-Class-308-10) Avail: US Patent Office CSCL 13I

A single magnetic, radial bearing having a disc with an axis coincident with the bearing or shaft axis is described. The bearing passively supports an annulus which forms a radial gap between its inner circumferential edge and the circumferential edge of the disc. The disc has a relatively large diameter compared to its length along the axis.
Official Gazette, of the U.S. Patent Office



N77-17466*# National Aeronautics and Space Administration. *Pasadena Office, Calif.*

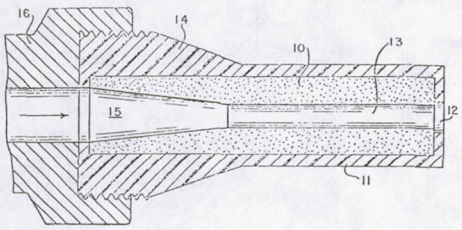
IMPROVED NOZZLE FOR USE WITH ABRASIVE AND/OR CORROSIVE MATERIALS Patent Application

Gerald S. Perkins (JPL), Eugene V. Pawlik (JPL), and Wayne M. Phillips, inventors (to NASA) (JPL) Filed 17 Feb. 1976 25 p (Contract NAS7-100)

(NASA-Case-NPO-13823-1; US-Patent-Appl-SN-658487) Avail: NTIS HC A02/MF A01 CSCL 13I

A nozzle composed of sintered ceramic materials having high temperature oxidation resistance, high hardness and high abrasion and corrosion resistance is described. The ceramic may be a binary solid solution of a ceramic oxide and silicon nitride, or 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 thereof. 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.

NASA



N77-17467*# National Aeronautics and Space Administration. Pasadena Office, Calif.

IMPROVEMENT IN COMBUSTION ENGINE Patent Application

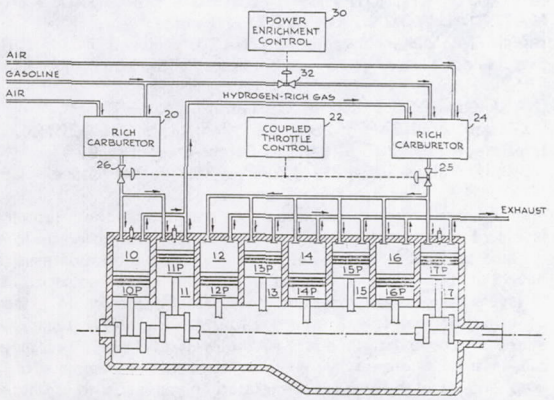
John Houseman, inventor (to NASA) (JPL) Filed 2 Apr. 1975 21 p

(Contract NAS7-100)

(NASA-Case-NPO-13671-1; US-Patent-Appl-SN-564622) Avail: NTIS HC A02/MF A01 CSCL 21A

An internal combustion engine is described in which one or more of the cylinders of the engine are used for generating hydrogen rich gases from hydrocarbon fuels. These gases are then mixed with air and injected into the remaining cylinders to be used as fuel. When heavy load conditions are encountered, hydrocarbon fuel may be mixed with the hydrogen rich gases and air and the mixture injected into the remaining cylinders as fuel.

NASA



N77-19457* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

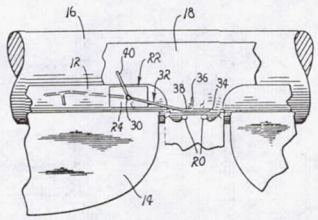
GUIDE FOR A TYPEWRITER Patent

Robert D. Dubois (Boeing Co., Huntsville, Ala.) and George T. Pinson, inventors (to NASA) (Boeing Co., Huntsville, Ala.) Issued 2 Nov. 1976 4 p Filed 9 Aug. 1973 Supersedes N73-31438 (11 - 22, p 2676) Sponsored by NASA

(NASA-Case-MFS-15218-1; US-Patent-3,989,136; US-Patent-Appl-SN-387094; US-Patent-Class-197-188; US-Patent-Class-197-190) Avail: US Patent Office CSCL 13I

The invention relates to accessories for typewriters, and more particularly to an improved guide for use in aligning a sheet of paper preparatory to an application of typed indicia to selected spaces. The device includes an aligning plate pivotally mounted on a line guide having formed therein a plurality of aligned apertures. The plate is so positioned that an aperture is positioned immediately above a target area for a type slug so that a slug will imprint a character in selected spaces.

Official Gazette of the U.S. Patent Office



N77-19458* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

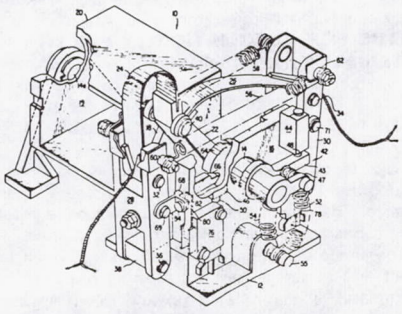
CYCLICAL BI-DIRECTIONAL ROTARY ACTUATOR Patent

William C. Stange, inventor (to NASA) Issued 1 Mar. 1977 12 p Filed 17 Jul. 1975 Supersedes N75-29430 (13-20, p 2526)

(NASA-Case-GSC-11883-1; NASA-Case-GSC-11974-1; NASA-Case-GSC-11975-1; US-Patent-4,010,455; US-Patent-Appl-SN-596787; US-Patent-Class-340-224; US-Patent-Class-310-4A; US-Patent-Class-60-527; US-Patent-Class-75-170; US-Patent-Class-337-334; US-Patent-Class-75-122.7) Avail: US Patent Office CSCL 13I

A thermally powered rotary actuator is disclosed which is used for positioning a shaft in first and second positions which are disposed 180 deg apart. A pair of heat extensible springs are attached to the shaft and to the frame of the rotary actuator for selectively rotating the shaft from one of its two positions to the other position upon the application of heat to one of the heat extensible springs. The heat extensible springs are preferably constructed from the alloy 55-Nitinol. In the preferred embodiment, a detent mechanism is provided for locking the rotatable shaft in its two rotary positions.

Official Gazette of the U.S. Patent Office



N77-19459*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

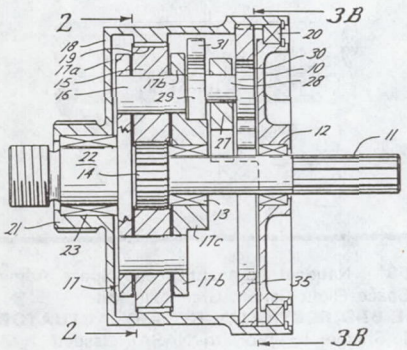
SEQUENCING DEVICE UTILIZING PLANETARY GEAR SET Patent Application

Walter T. Appleberry, inventor (to NASA) (Rockwell Intern. Corp., Downey, Calif.) Filed 25 Feb. 1977 12 p

(Contract NAS9-1400)

(NASA-Case-MSC-19514-1; US-Patent-Appl-SN-772168) Avail: NTIS HC A02/MF A01 CSCL 13I

A planetary (epicyclic) gear set is provided with a continuously rotating input and individual outputs actuated, respectively, by the ring gear and planet gear carrier. Latch means is positioned to selectively stop one of the ring gear and carrier members while starting the other to provide the desired sequential output operation. NASA



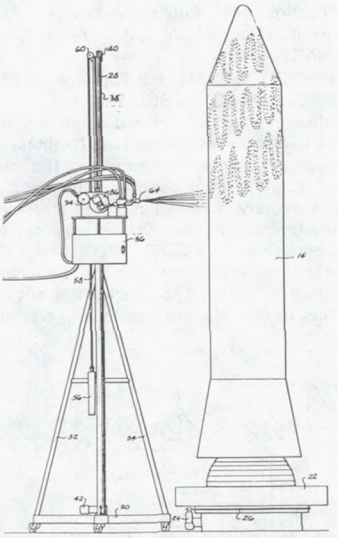
N77-20441*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

APPARATUS FOR AUTOMATICALLY SPRAYING A COATING MATERIAL Patent Application

Max H. Sharpe, William G. Simpson, and James M. Carter, inventors (to NASA) Filed 15 Feb. 1977 19 p

(NASA-Case-MFS-23506-2; US-Patent-Appl-SN-768794) Avail: NTIS HC A02/MF A01 CSCL 13H

A device is described for automatically spraying a coating on an elongated body; e. g., spraying ablative material on a space vehicle. The space vehicle is rotated on a rotatable table in an upright position. A vertically extending support is positioned adjacent the space vehicle and has a housing which is automatically raised and lowered thereon. A spray nozzle is mounted on the housing and is reciprocated up and down so as to spray a predetermined pattern on the space vehicle. A spraying material is carried within a mixing vat and a supply pump is used for pumping the spraying material to the nozzle. NASA



38 QUALITY ASSURANCE AND RELIABILITY

Includes product sampling procedures and techniques; and quality control.

N77-17495* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

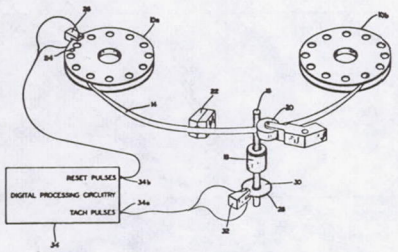
METHOD AND APPARATUS FOR MEASURING WEB MATERIAL WOUND ON A REEL Patent

Ronald M. Muller, inventor (to NASA) Issued 4 Jan. 1977 9 p Filed 4 Apr. 1975 Supersedes N75-22687 (13 - 14, p 1652)

(NASA-Case-GSC-11902-1; US-Patent-4,001,552; US-Patent-Appl-SN-565289; US-Patent-Class-235-92DN; US-Patent-Class-235-92CA; US-Patent-Class-235-92CT; US-Patent-Class-235-92R) Avail: US Patent Office CSCL 14B

The method and apparatus for measuring the number of layers of a web material of known thickness wound on a storage or take-up reel is presented. The method and apparatus are based on the principle that, at a relatively large radius, the loci of layers of a thin web wound on the reel approximate a family of concentric circles having radii respectively successively increasing by a length equal to the web thickness. Tachometer pulses are generated in response to linear movement of the web and reset pulses are generated in response to rotation of the reel. A digital circuit, responsive to the tachometer and reset

pulses, generates data indicative of the layer number of any layer of the web and of position of the web within the layer without requiring numerical interpolation.
Official Gazette of the U.S. Patent Office



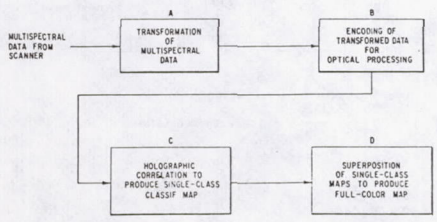
43 EARTH RESOURCES

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

For instrumentation see *35 Instrumentation and Photography*.

N77-10584* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
OPTICAL PROCESS FOR PRODUCING CLASSIFICATION MAPS FROM MULTISPECTRAL DATA Patent
Richard E. Haskell, inventor (to NASA) (Oakland Univ.) Issued 5 Oct. 1976 12 p Filed 30 Aug. 1974 Supersedes N74-32780 (12 - 22, p 2680) Sponsored by NASA
(NASA-Case-MSC-14472-1; US-Patent-3,984,671;
US-Patent-Appl-SN-502138; US-Patent-Class-235-181;
US-Patent-Class-340-146.3P; US-Patent-Class-340-146.3Q)
Avail: US Patent Office CSCL 08B

A method of producing single-class and multi-class composite classification maps from multispectral data is provided. The multispectral data is transformed into a binary matrix format which is then encoded on an optical medium such as photographic film. The encoded data is holographically correlated with coded patterns representing selected spectral signatures to produce signal-class classification maps. Several single-class maps are optically superimposed to produce multi-class composite classification maps. Official Gazette of the U.S. Patent Office



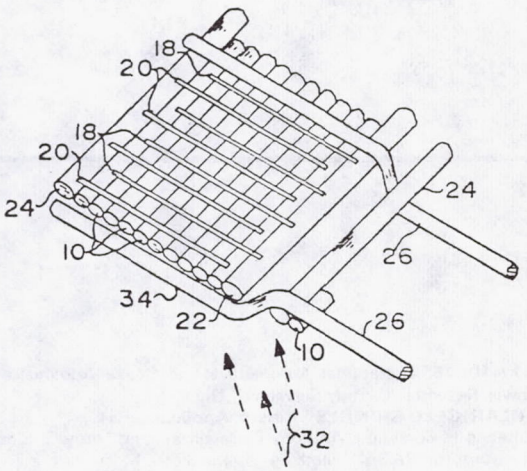
44 ENERGY PRODUCTION AND CONVERSION

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.*

N77-10635* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PHOTOVOLTAIC CELL ARRAY Patent
Jon T. Eliason, inventor (to NASA) (Sperry Rand Corp., Huntsville, Ala.) Issued 5 Oct. 1976 4 p Filed 25 Apr. 1975 Supersedes N75-22900 (13 - 14, p 1677) Sponsored by NASA
(NASA-Case-MFS-22458-1; US-Patent-3,984,256;
US-Patent-Appl-SN-571458; US-Patent-Class-136-89;
US-Patent-Class-29-572) Avail: US Patent Office CSCL 10A

A photovoltaic cell array consisting of parallel columns of silicon filaments is described. Each fiber is doped to produce an inner region of one polarity type and an outer region of an opposite polarity type to thereby form a continuous radial semi conductor junction. Spaced rows of electrical contacts alternately connect to the inner and outer regions to provide a plurality of electrical outputs which may be combined in parallel or in series. Official Gazette of the U.S. Patent Office



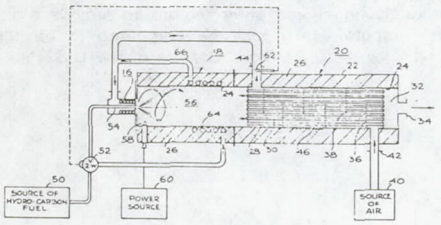
N77-10636* National Aeronautics and Space Administration. Pasadena Office, Calif.

HYDROGEN-RICH GAS GENERATOR Patent

John Houseman (JPL) and Donald J. Cerini, inventors (to NASA) (JPL) Issued 28 Sep. 1976 15 p Filed 10 Jul. 1974 Supersedes N76-18460 (14 - 09, p 1127) Sponsored by NASA (NASA-Case-NPO-13560-1; NASA-Case-NPO-13561-1; US-Patent-3,982,910; US-Patent-Appl-SN-487156; US-Patent-Class-48-61; US-Patent-Class-23-281; US-Patent-Class-48-116; US-Patent-Class-48-117; US-Patent-Class-48-197R; US-Patent-Class-48-212; US-Patent-Class-123-3; US-Patent-Class-252-373; US-Patent-Class-423-650; US-Patent-Class-431-11; US-Patent-Class-431-41; US-Patent-Class-431-116; US-Patent-Class-431-162; US-Patent-Class-431-170) Avail: US Patent Office CSCL 10B

A process and apparatus are described for producing hydrogen-rich product gases. A spray of liquid hydrocarbon is mixed with a stream of air in a startup procedure and the mixture is ignited for partial oxidation. The stream of air is then heated by the resulting combustion to reach a temperature such that a signal is produced. The signal triggers a two way valve which directs liquid hydrocarbon from a spraying mechanism to a vaporizing mechanism with which a vaporized hydrocarbon is formed. The vaporized hydrocarbon is subsequently mixed with the heated air in the combustion chamber where partial oxidation takes place and hydrogen-rich product gases are produced.

Official Gazette of the U.S. Patent Office



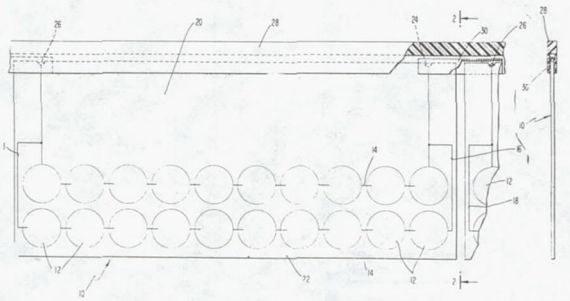
N77-10645*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SOLAR CELL SHINGLE Patent Application

Americo F. Forestieri, Anthony F. Ratajczak, and Leroy G. Sidorak, inventors (to NASA) Filed 24 Aug. 1976 11 p (NASA-Case-LEW-12587-1; US-Patent-Appl-SN-717319) Avail: NTIS HC A02/MF A01 CSCL 10A

A solar cell shingle may be made of an array of solar cells on a lower portion of a substantially rectangular shingle substrate made of fiberglass cloth or the like. The solar cells may be encapsulated in fluorinated ethylene propylene or some other weatherproof translucent or transparent encapsulant to form a combined electrical module and a roof shingle. The interconnected solar cells are connected to connectors at the edge of the substrate through a connection to a common electrical bus or busses. An overlap area is arranged to receive the overlap of a cooperating similar shingle so that the cell portion of the cooperating shingle may overlie the overlap area of the roof shingle. Accordingly the same shingle serves the double function of an ordinary roof shingle which may be applied in the usual way and an array of cooperating solar cells from which electrical energy may be collected.

NASA



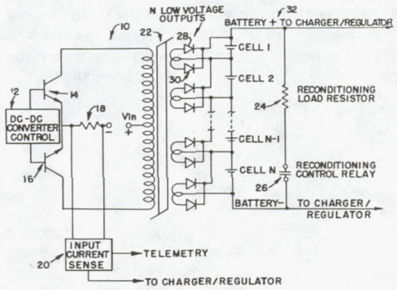
N77-12511*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

METHOD AND APPARATUS FOR RECONDITIONING NICKEL-CADMIUM BATTERIES Patent Application

Robert E. Kapustka, inventor (to NASA) Filed 24 Nov. 1976 13 p (NASA-Case-MFS-23270-1; US-Patent-Appl-SN-744573) Avail: NTIS HC A02/MF A01 CSCL 10C

A method and apparatus for reconditioning batteries are described which can be applied in reconditioning nickel-cadmium batteries in outer space. A DC-DC converter monitors the output of each cell of a Ni-Cd battery through the use of N low voltage outputs connected in parallel to the converter. The open circuit output voltage of each of these outputs is less than the battery cell voltage. Because each output consists of two rectifier diodes 28, 30, the cell voltage will normally reverse bias (turn off) the two diodes in each output. If, however, the cell voltage falls below the voltage of its corresponding output, the voltage from a transformer winding in the converter would forward bias the diodes and would assume the load. This would prevent the cell from reaching zero voltage and reversing its polarity during normal operation or reconditioning.

NASA



N77-14580* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

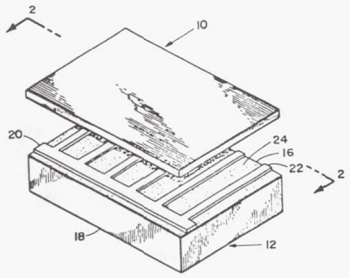
SILICON NITRIDE COATED, PLASTIC COVERED SOLAR CELL Patent

Jacob D. Broder, inventor (to NASA) Issued 7 Dec. 1976 4 p Filed 30 Dec. 1975 Supersedes N76-14613 (14 - 05, p 0604)

(NASA-Case-LEW-11496-1; US-Patent-3,996,067; US-Patent-Appl-SN-645508; US-Patent-Class-136-89; US-Patent-Class-204-192) Avail: US Patent Office CSCL 10A

A non-oxide anti-reflective coating was used with a transparent plastic cover of fluorinated ethylene propylene copolymer on a silicon solar cell to increase the resistance to damage caused by electron bombardment.

Official Gazette of the U.S. Patent Office



N77-14581* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

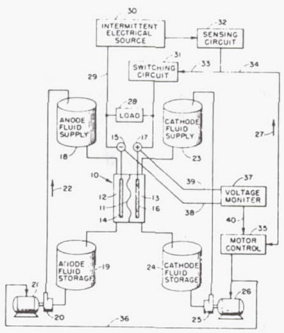
ELECTRICALLY RECHARGEABLE REDOX FLOW CELL Patent

Lawrence H. Thaller, inventor (to NASA) Issued 7 Dec. 1976 6 p Filed 22 Aug. 1975 Supersedes N75-32586 (13 - 23, p 2938)

(NASA-Case-LEW-12220-1; US-Patent-3,996,064; US-Patent-Appl-SN-606891; US-Patent-Class-320-2; US-Patent-Class-429-23; US-Patent-Class-429-34) Avail: US Patent Office CSCL 10C

A bulk energy storage system is designed with an electrically rechargeable reduction-oxidation (REDOX) cell divided into two compartments by a membrane, each compartment containing an electrode. An anode fluid is directed through the first compartment at the same time that a cathode fluid is directed through the second compartment. Means are provided for circulating the anode and cathode fluids, and the electrodes are connected to an intermittent or non-continuous electrical source, which when operating, supplies current to a load as well as to the cell to recharge it. Ancillary circuitry is provided for disconnecting the intermittent source from the cell at prescribed times and for circulating the anode and cathode fluids according to desired parameters and conditions.

Official Gazette of the U.S. Patent Office



N77-15490*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

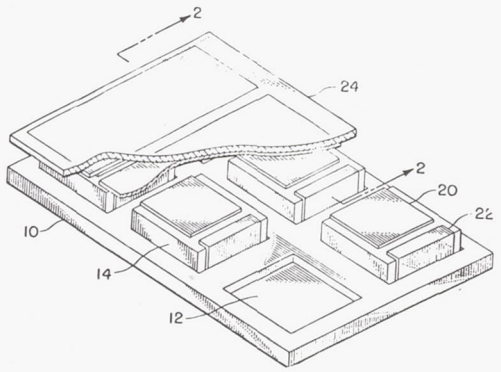
ENCAPSULATED SOLAR CELL MODULES Patent Application

Evelyn Anagnostou and Americo F. Forestieri, inventors (to NASA) Filed 30 Nov. 1976 9 p

(NASA-Case-LEW-12185-1; US-Patent-Appl-SN-746269) Avail: NTIS HC A02/MF A01 CSCL 10A

A procedure is described in which the electrical connections to solar cells in a module are made at the same time the cells are encapsulated for protection. The encapsulating material is embossed to facilitate the positioning of the cells during assembly.

NASA



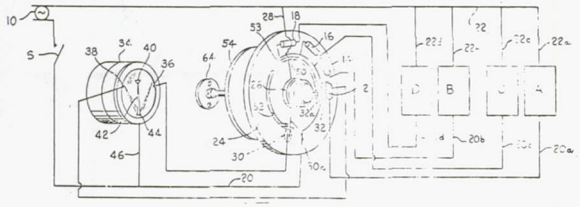
N77-15493*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

ILLUMINATION CONTROL APPARATUS FOR COMPENSATING SOLAR LIGHT Patent Application

Lester J. Owens, inventor (to NASA) Filed 23 Dec. 1976 20 p

(NASA-Case-KSC-11010-1; US-Patent-Appl-SN-753977) Avail: NTIS HC A02/MF A01 CSCL 10A

An illumination control apparatus for supplementing light from solar radiation with light from an artificial light source was designed to compensate for periods of insufficient levels of solar light to maintain a desired illumination level within an interior space. The apparatus comprises an artificial light source connected to an electrical power source, a switch for selectively energizing the light source, and an actuator for controlling the on-off operation of the switch. A light sensor is connected to the actuator to control it in response to the illumination level of the interior space. A limit switch is carried adjacent to actuator to limit the movement of the actuator within a predetermined range. This prevents further movement during detection of erroneous illumination conditions. NASA



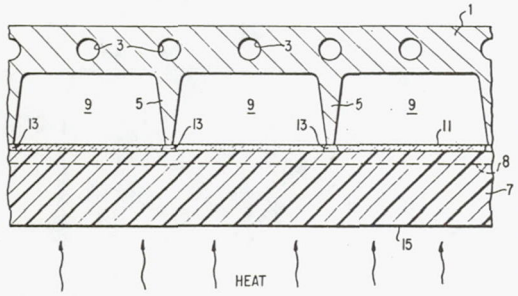
N77-17564*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SOLAR CELL COLLECTOR AND METHOD FOR PRODUCING SAME Patent Application

John C. Evans, Jr., inventor (to NASA) Filed 22 Feb. 1977 16 p

(NASA-Case-LEW-12552-1; US-Patent-Appl-SN-776869) Avail: NTIS HC A02/MF A01 CSCL 10A

A method is described which permits the formation of highly conductive metal channels in a continuous pattern of any desired design within a transparent conductive mixed oxide layer which covers and protects an underlying photovoltaic substrate. The result is a sufficient collector system for the current generated by incident photon radiation. NASA



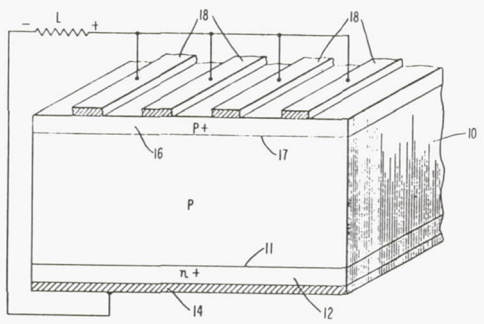
N77-17565*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

IMPROVED BACKWALL CELL Patent Application

Henry W. Brandhorst, Jr., inventor (to NASA) Filed 19 Jan. 1977 15 p

(NASA-Case-LEW-12236-1; US-Patent-Appl-SN-760771) Avail: NTIS HC A02/MF A01 CSCL 10A

A solar cell is described having a first material of one conductivity type with one face having the same conductivity type more heavily doped to form a field region to receive the radiant energy. A layer of opposite conductivity type or a metallic layer forming a Schottky barrier is applied to the opposite face. A gridded contact pervious to the radiant energy may be applied to the region of the more heavily doped material for electrical contact. The device allows separate control of the junction, either the p-n junction or the Schottky diode junction, and the efficient collection of light. This efficiency is improved, because the high conductivity region has low sheet resistance, and a low surface recombination velocity with enhanced effective diffusion lengths in bulk. NASA



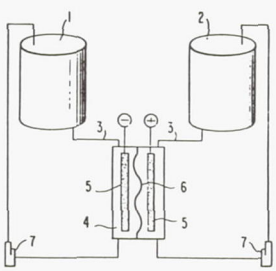
N77-18560*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

FORMULATED PLASTIC SEPARATORS FOR SOLUBLE ELECTRODE CELLS Patent Application

Dean W. Sheibley, inventor (to NASA) Filed 10 Mar. 1977 22 p

(NASA-Case-LEW-12358-1; US-Patent-Appl-SN-776146) Avail: NTIS HC A02/MF A01 CSCL 10C

A rubber ion transport sheeting material formulated with o without a flexible and porous substrate is described for use as the membrane between the acid compartments of a redox couple in a bulk electrical energy storage system. The membrane exhibits minimal increases in resistivity with the passage of time and prevents the accumulation of unequal amounts of water between the two sides of the redox cell. NASA



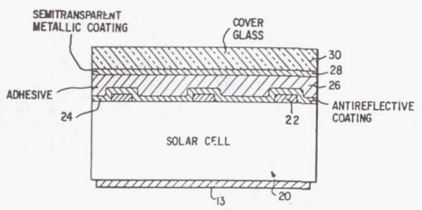
N77-19571* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SOLAR CELL ASSEMBLY Patent

Henry W. Brandhorst, Jr., inventor (to NASA) Issued 2 Nov. 1976 5 p Filed 30 Sep. 1974 Supersedes N74-33484 (12 - 23, p 2775)

(NASA-Case-LEW-11549-1; US-Patent-3,989,541; US-Patent-Appl-SN-510677; US-Patent-Class-136-89) Avail: US Patent Office CSCL 10A

The solar cell assembly includes a solar cell having an overlay of a semi-transparent coating of a metal, such as aluminum or silver, which covers the entire surface thereof. The purpose of the coating is to lower the amount of incident radiation on the cell and thereby lower cell temperature. The use of the semi-transparent coating over the entire cell surface uniformly limits incident radiation and hence reduces cell heat without any temperature gradients. The coating also lowers series cell resistance. The coating may be directly deposited on the cell surface or on the undersurface of a cover plate bonded to the cell. Official Gazette of the U.S. Patent Office



N77-19579*# National Aeronautics and Space Administration. Pasadena Office, Calif.

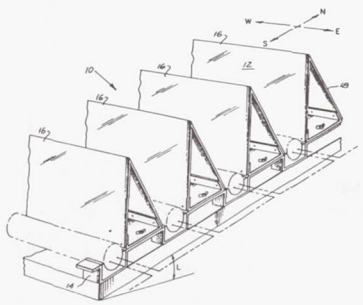
A NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM Patent Application

M. Kudret Selcuk, inventor (to NASA) (JPL) Filed 2 Mar. 1977 17 p

(Contract NAS7-100)

(NASA-Case-NPO-13813-1; NASA-Case-NPO-13914-1; US-Patent-Appl-SN-765139) Avail: NTIS HC A02/MF A01 CSCL 10A

A solar energy collector system is described in which an improved concentrator is used for directing incident rays of solar energy on parallel vacuum-jacketed receivers or absorbers. A plurality of individually mounted reflector modules of a common asymmetrical triangular cross-sectional configuration are supported for independent reorientation. A plurality of asymmetric vee trough concentrators is defined. NASA



N77-19581*# National Aeronautics and Space Administration. Pasadena Office, Calif.

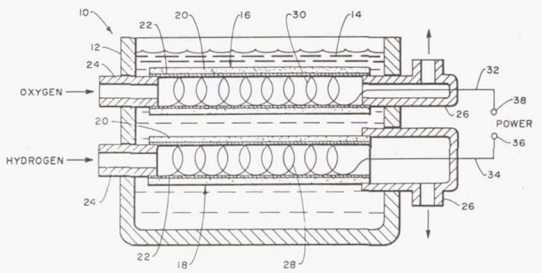
DUAL MEMBRANE, HOLLOW FIBER FUEL CELL Patent Application

John D. Ingham (JPL) and Daniel D. Lawson, inventors (to NASA) (JPL) Filed 3 Feb. 1977 12 p

(Contract NAS7-100)

(NASA-Case-NPO-13732-1; US-Patent-Appl-SN-765138) Avail: NTIS HC A02/MF A01 CSCL 10A

A gaseous fuel cell is described which includes a pair of electrodes formed by open ended, ion-exchange hollow fibers, each having a layer of metal catalyst deposited on the inner surface thereof and large surface area current collectors such as braided metal mesh in contact with the metal catalyst layer. A fuel cell results when the electrodes are immersed in electrolyte and electrically connected. As hydrogen and oxygen flow through the bore of the fibers oxidation and reduction reactions develop an electrical potential. Because the hollow fiber configuration provides large electrode area per unit volume and intimate contact between fuel and oxidizer at the interface, and because of the low internal resistance of the electrolyte, high power densities can be obtained. NASA



N77-20565*# National Aeronautics and Space Administration. Pasadena Office, Calif.

SOLAR ENERGY COLLECTION SYSTEM Patent Application

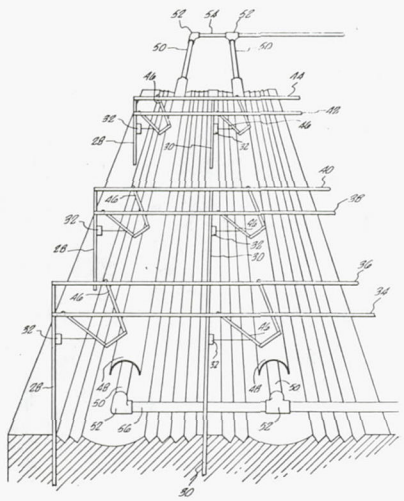
Charles G. Miller (JPL) and James B. Stephens, inventors (to NASA) (JPL) Filed 25 Jan. 1977 57 p

(Contract NAS7-100)

(NASA-Case-NPO-13579-2; US-Patent-Appl-SN-762362) Avail: NTIS HC A04/MF A01 CSCL 10A

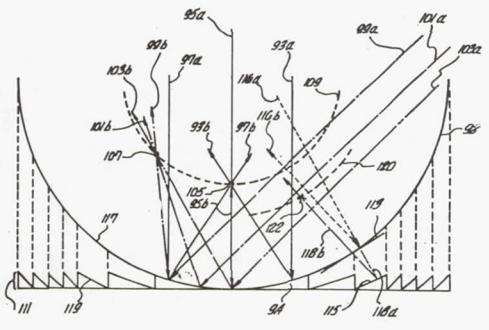
A fixed, linear, ground based primary reflector having an extended curved sawtooth-contoured surface covered with a metalized polymeric reflecting material, reflects solar energy to a movably supported collector that is kept at the concentrated line focus of the reflector primary. The primary reflector may be constructed by a process utilizing well-known freeway paving machinery. The solar energy absorber is preferably a fluid-transporting pipe. Efficient utilization leading to high temperatures from the reflected solar energy is obtained by cylindrical shaped secondary reflectors that direct off-angle energy to the absorber pipe. A seriatim arrangement of cylindrical secondary reflector

stages and spot forming reflector stages produces a high temperature solar energy collection system of greater efficiency.
NASA



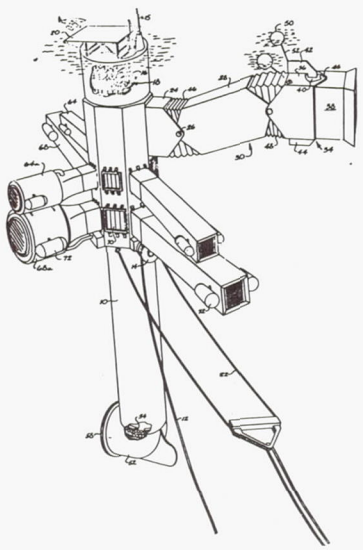
N77-20566*# National Aeronautics and Space Administration. Pasadena Office, Calif.
LOW COST SOLAR ENERGY COLLECTION SYSTEM Patent Application
Charles G. Miller (JPL) and James B. Stephens, inventors (to NASA) (JPL) Filed 25 Jan. 1977 22 p
(Contract NAS7-100)
(NASA-Case-NPO-13579-3; US-Patent-Appl-SN-762363) Avail: NTIS HC A02/MF A01 CSCL 10A

A fixed, linear, ground based primary reflector having an extended curved sawtooth contoured surface covered with a metalized polymeric reflecting material, reflects solar energy to a movably supported collector that is kept at the concentrated line focus of the reflector primary. The primary reflector may be constructed by a process utilizing well known freeway paving machinery.
NASA



N77-21666*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
OCEAN THERMAL PLANT Patent Application
Lester J. Owens, inventor (to NASA) Filed 29 Mar. 1977 18 p
(NASA-Case-KSC-11034-1; US-Patent-Appl-SN-782481) Avail: NTIS HC A02/MF A01 CSCL 10A

An ocean thermal plant consisting of a floating energy converter utilizing large volumes of sea water to produce electrical power is described. In this plant, a fluid working medium is pumped to an evaporator where it is heated by a flow of warm surface sea water. The fluid in liquid form boils to a pressurized gas vapor which is routed to drive a turbine that, in turn, drives a generator for producing electricity. The gas vapor then enters a condenser immersed in cold sea water pumped from lower depths. The gas vapor condenses to its original liquid form and is then pumped to the evaporator to repeat the cycle. Modular components can be readily interchanged on the ocean thermal unit, and inlet pipes for the sea water are provided with means for maintaining the pipes in alignment with the oncoming current. The modular construction allows for the testing of various components to provide a more rapid optimization of a standardized plant.
NASA



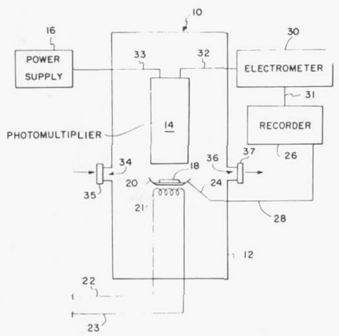
45 ENVIRONMENT POLLUTION

Includes air, noise, thermal and water pollution; environment monitoring; and contamination control.

N77-17609*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A METHOD FOR AEROSOL ANALYSIS BY THERMOLUMINESCENCE Patent Application
Robert S. Rogowski and Edward R. Long, Jr., inventors (to NASA) Filed 29 Dec. 1976 16 p
(NASA-Case-LAR-12046-1; US-Patent-Appl-SN-755310) Avail: NTIS HC A02/MF A01 CSCL 13B

A method is described for detecting and measuring peak thermoluminescence of a test sample to serve as an aid in

determining the source of aerosols in a specific geographic area. NASA



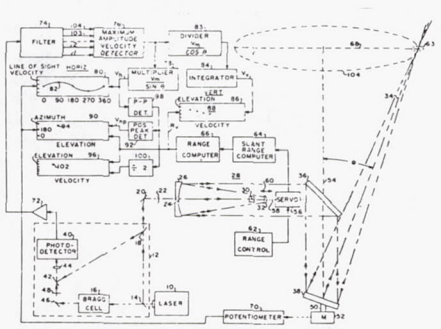
47 METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

N77-10753* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
WIND MEASUREMENT SYSTEM Patent
William C. Cliff, Robert M. Huffaker, Werner K. Dahm, James A. L. Thomson (Physical Dyn., Inc., Berkeley, Calif.), Thomas R Lawrence (LMSC, Huntsville, Ala.), Michael C. Krause (LMSC, Huntsville, Ala.), and David J. Wilson, inventors (to NASA) (LMSC, Huntsville, Ala.) Issued 5 Oct. 1976 5 p Filed 3 Dec. 1975 Supersedes N76-13701 (14 - 04, p 0484)
(NASA-Case-MFS-23362-1; US-Patent-3,984,685;
US-Patent-Appl-SN-637268; US-Patent-Class-250-339;
US-Patent-Class-250-338; US-Patent-Class-250-347;
US-Patent-Class-356-106R) Avail: US Patent Office CSCL 04B

A system for remotely measuring vertical and horizontal winds present in discrete volumes of air at selected locations above the ground is described. A laser beam is optically focused in range by a telescope, and the output beam is conically scanned at an angle about a vertical axis. The backscatter, or reflected light, from the ambient particulates in a volume of air, the focal volume, is detected for shifts in wavelength, and from these, horizontal and vertical wind components are computed.

Official Gazette of the U.S. Patent Office



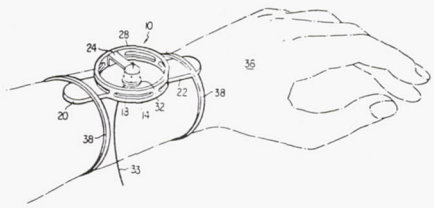
52 AEROSPACE MEDICINE

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

N77-10780* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
THERMISTOR HOLDER FOR SKIN TEMPERATURE MEASUREMENTS Patent
John E. Greenleaf and Bill A. Williams, inventors (to NASA) Issued 5 Oct. 1976 4 p Filed 29 Sep. 1975 Supersedes N75-33642 (13 - 24, p 3077)
(NASA-Case-ARC-10855-1; US-Patent-3,983,753;
US-Patent-Appl-SN-617612; US-Patent-Class-73-343R;
US-Patent-Class-128-2H) Avail: US Patent Office CSCL 06B

An improved thermistor holder structure is disclosed which facilitates skin-temperature measurement. The device includes a cylindrical plastic housing with tab extensions that permits the apparatus to be held to a skin surface by suitable elastic members or the like. Ventilation openings are provided in the plastic housing to permit air circulation. An adjustable, resilient metal arm with a thermistor holding cup formed at one end is secured to the interior surface of the plastic housing such that the holding cup is located at the center of the housing. A thermistor temperature sensor is inserted into and held in the cup by interference fit.

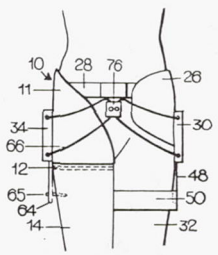
Official Gazette of the U.S. Patent Office



N77-14735* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ACTUATOR DEVICE FOR ARTIFICIAL LEG Patent
John L. Burch, inventor (to NASA) Issued 7 Dec. 1976 7 p Filed 12 Sep. 1975 Supersedes N75-32767 (13 - 23, p 2963)
(NASA-Case-MFS-23225-1; US-Patent-3,995,324;
US-Patent-Appl-SN-612965; US-Patent-Class-3-1.2;
US-Patent-Class-3-14) Avail: US Patent Office CSCL 06B

An actuator device is described for moving an artificial leg of a person having a prosthesis replacing an entire leg and hip joint. The device includes a first articulated hip joint assembly carried by the natural leg and a second articulated hip joint assembly carried by the prosthesis whereby energy from the movement of the natural leg is transferred by a compressible fluid from the first hip joint assembly to the second hip joint assembly for moving the artificial leg.

Official Gazette of the U.S. Patent Office



N77-14736* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

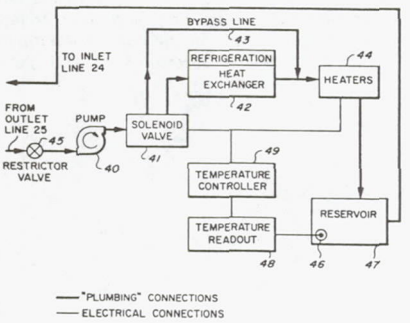
LIQUID COOLED BRASSIERE AND METHOD OF DIAGNOSING MALIGNANT TUMORS THEREWITH Patent

William Elkins (Acurex Corp.), Bill Alvin Williams, and Ernest Glenn Tickner, inventors (to NASA) (Acurex Corp.) Issued 7 Dec. 1976 8 p Filed 27 Jan. 1976 Supersedes N76-18782 (14 - 09, p 1168)

(NASA-Case-ARC-11007-1; US-Patent-3,995,621; US-Patent-Appl-SN-652948; US-Patent-Class-128-2H; US-Patent-Class-128-379; US-Patent-Class-128-400; US-Patent-Class-128-402) Avail: US Patent Office CSCL 06B

A device for enhancing the detection of malignant tissue in the breasts of a woman was described. A brassiere-like garment which is fitted with a pair of liquid-perfused cooling panels which completely and compliantly cover the breasts and upper torso was studied. The garment is connected by plastic tubing to a liquid cooling system comprising a fluid pump, a solenoid control valve for controlling the flow of fluid to either the cooling unit or the heating unit, a fluid reservoir, a temperature sensor in the reservoir, and a restrictor valve to control the pressure in the garment inlet cooling line.

Official Gazette of the U.S. Patent Office



N77-14737* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

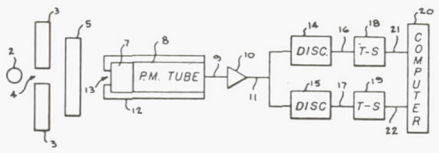
METHOD AND SYSTEM FOR IN VIVO MEASUREMENT OF BONE TISSUE USING A TWO LEVEL ENERGY SOURCE Patent

John R. Cameron (Wisconsin U., Madison) and Philip F. Judy, inventors (to NASA) (Wisconsin U., Madison) Issued 7 Dec. 1976 8 p Filed 11 Mar. 1975 Supersedes N75-21948 (13 - 13, p 1552) Sponsored by NASA

(NASA-Case-MSC-14276-1; US-Patent-3,996,471; US-Patent-Appl-SN-557430; US-Patent-Class-250-444; US-Patent-Class-250-498; US-Patent-Class-250-363R) Avail: US Patent Office CSCL 06B

Methods and apparatus are provided for radiologically determining the bone mineral content of living human bone tissue independently of the concurrent presence of adipose and other soft tissues. A target section of the body of the subject is irradiated with a beam of penetrative radiations of preselected energy to determine the attenuation of such beam with respect to the intensity of each of two radiations of different predetermined energy levels. The resulting measurements are then employed to determine bone mineral content.

Official Gazette of the U.S. Patent Office



N77-14738* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

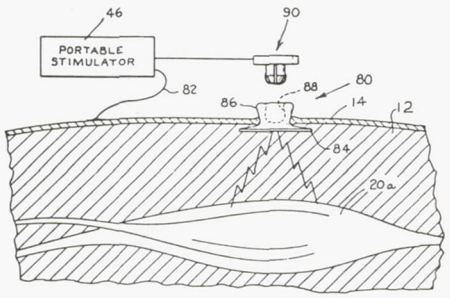
PERCUTANEOUS CONNECTOR DEVICE Patent

Walter E. Parsons, inventor (to NASA) Issued 7 Dec. 1976 6 p Filed 16 Sep. 1975 Supersedes N76-19816 (14 - 10, p 1303)

(NASA-Case-KSC-10849-1; US-Patent-3,995,644; US-Patent-Appl-SN-613734; US-Patent-Class-128-418; US-Patent-Class-3-1.1; US-Patent-Class-339-252R) Avail: US Patent Office CSCL 06B

A device is reported for facilitating the passage of electrical signals from an external source through the skin of a patient to internal portions of the body such as muscles and nerves. The connector device includes a bio-compatible shell having an enlarged disk shaped portion for being implanted below the skin of the patient. The shell has a first and second electrically conductive post carried therein upon which a plug can be readily connected and disconnected. A modified form of the invention utilizes a unipolar connector that is adapted to be plugged into a shell implanted below the skin of a patient. Both of the connector devices are designed to be separated when a predetermined force is applied. This prevents excessive force from being applied to the implanted bio-compatible shell.

Official Gazette of the U.S. Patent Office



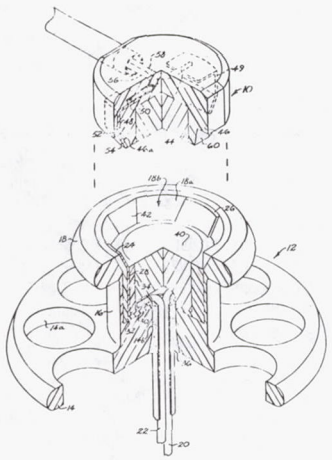
N77-15617*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

MAGNETIC ELECTRICAL CONNECTORS FOR BIOMEDICAL PERCUTANEOUS IMPLANTS Patent Application

Lester J. Owens, inventor (to NASA) Filed 30 Jul. 1976 14 p

(NASA-Case-KSC-11030-1; US-Patent-Appl-SN-709849) Avail: NTIS HC A02/MF A01 CSCL 06B

A biomedical percutaneous connector for providing electrical connection between electrical conductors carried externally of a patient's body, and electrical conductors implanted within the body of the patient is described. The connector includes a socket having an enlarged disk shaped base portion for being implanted below the patient's skin. A cylindrical portion is integral with the base portion and extends outwardly of the skin. A conical recess is provided in a upper end of the cylindrical portion and has a magnet located in the base. Inclined conductive strips are carried on an upper end of the cylindrical portion adjacent the conical recess to which electrical conductors are attached and extend into the patient's body. A complementary shaped plug which also has electrical contacts provided is adaped to fit within the conical recess of the socket. NASA



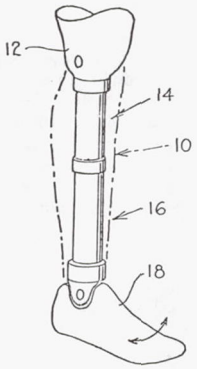
N77-15618*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

ROTATIONAL JOINT FOR THE PROSTHETIC LEG Patent Application

Lester J. Owens and William C. Jones, inventors (to NASA) Filed 30 Jul. 1976 14 p

(NASA-Case-KSC-11004-1; US-Patent-Appl-SN-710032) Avail: NTIS HC A02/MF A01 CSCL 06B

A rotational joint assembly for a prosthetic leg which enables an artificial foot to rotate slighly when a person is walking, running or turning is described. The prosthetic leg includes upper and lower tubular members with the rotational joint assembly interposed therebetween. The rotational joint assembly includes a restrainer mechanism which consists of a pivotably mounted paddle element engaging a resilient device for applying a limiting force to control the rotation of the foot and also restoring torque to return the foot back to its initial position. NASA



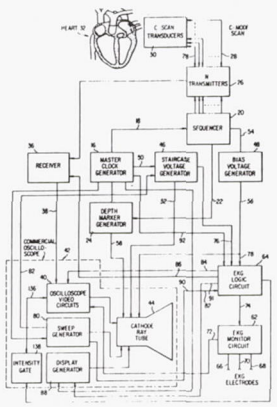
N77-15619*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

EKG AND ULTRASONOSCOPE DISPLAY Patent Application

Robert D. Lee, inventor (to NASA) Filed 17 Jan. 1977 21 p

(NASA-Case-ARC-10994-2; US-Patent-Appl-SN-759965) Avail: NTIS HC A02/MF A01 CSCL 06B

A system is disclosed which permits simultaneous display of an EKG waveform in real time in conjunction with a two dimensional cross sectional image of the heart, so that the EKG waveform can be directly compared with dimensional changes in the heart. The apparatus of the invention includes an ultrasonoscope for producing a C-scan cross-sectional image of the heart. An EKG monitor circuit along with EKG logic circuitry is combined with the ultrasonoscope circuitry to produce on the same oscilloscope screen a continuous vertical trace showing the EKG waveform simultaneously with the heart image. The logic circuitry controls the oscilloscope display such that the display of both heart and EKG waveforms occurs on a real time basis. NASA



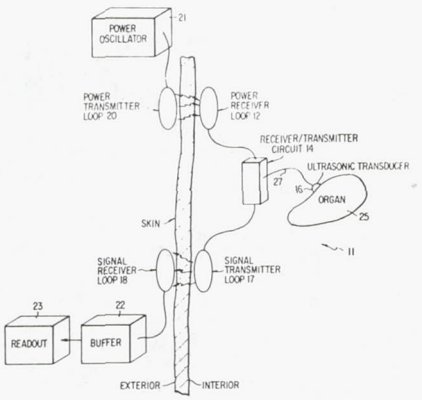
N77-15621*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

A MINIATURE IMPLANTABLE ULTRASONIC ECHOSONOMETER Patent Application

Gilbert K. Kojima, inventor (to NASA) Filed 12 Jan. 1977 14 p

(NASA-Case-ARC-11035-1; US-Patent-Appl-SN-758721) Avail: NTIS HC A02/MF A01 CSCL 06B

A miniature echosonometer adapted for implantation in the interior of an animal for imaging the internal structure of an organ, tissue or vessel is described. The echosonometer includes a receiver/transmitter circuit which is coupled to an ultrasonic transducer. Power is coupled to the echosonometer by electromagnetic induction through the animal's skin. Imaging signals from the echosonometer are electronmagnetically transmitted through the animal's skin to an external readout apparatus. NASA



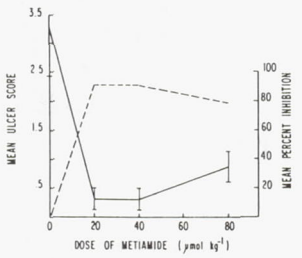
N77-17699*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ASPIRIN/METIAMIDE COMPOSITION Patent Application

Patricia A. Brown, inventor (to NASA) (San Jose State Univ., Calif.) Filed 31 Jan. 1977 15 p Sponsored by NASA

(NASA-Case-ARC-11038-1; US-Patent-Appl-SN-764329) Avail: NTIS HC A02/MF A01 CSCL 06E

A pharmaceutical preparation is described which counters gastric distress caused by the ingestation of aspirin by the inclusion of metiamide in the analgesic formulation. NASA



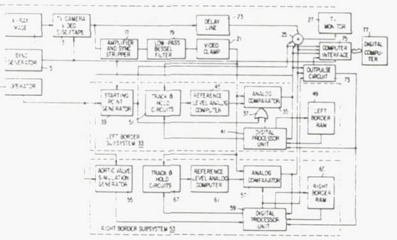
N77-17701*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

CONTOUR DETECTOR AND DATA ACQUISITION SYSTEM FOR THE LEFT VENTRICULAR OUTLINE Patent Application

John H. C. Reiber, inventor (to NASA) Filed 16 Feb. 1977 45 p

(NASA-Case-ARC-10985-1; US-Patent-Appl-SN-769148) Avail: NTIS HC A03/MF A01 CSCL 06B

A real-time contour detector and data acquisition system for an angiographic apparatus was stipulated. A video scanner converted an x-ray image of a structure characterized by a change in brightness level compared with its surrounding into video format and displayed the X-ray image in recurring video fields. Author



N77-18733*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

DETECTION OF MICROBIAL INFECTION IN BLOOD AND ANTIBIOTIC DETERMINATIONS Patent Application

Christian G. Schrock (New Engl. Med. Center Hospitals), Jody W. Deming (New Engl. Med. Center Hospitals), Grace L. Picciolo, and Emmett W. Chappelle, inventors (to NASA) Filed 19 Jan. 1977 26 p

(NASA-Case-GSC-12045-1; US-Patent-Appl-SN-760795) Avail: NTIS HC A03/MF A01 CSCL 06B

A method for the rapid detection of bacteria in blood and quick determination of the susceptibilities of various unidentified bacteria contained in blood to one or more antibiotics is described. A bacterial adenosine triphosphate (ATP) assay is carried out after the elimination of interfering cellular elements in blood and non-bacterial ATP to determine whether an infection exists. If an infection does exist, a portion of a blood culture is further processed, including subjecting parts of the portion to one or more antibiotics. Change in bacterial ATP in the parts is determined, again by an ATP assay, to determine whether the unidentified bacteria in the sample are susceptible to the antibiotic or antibiotics under test. Author

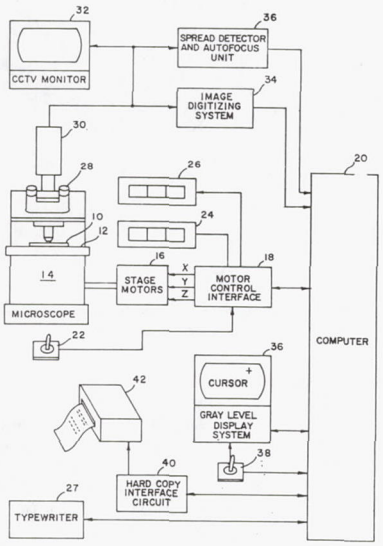
N77-19750*# National Aeronautics and Space Administration. Pasadena Office, Calif.

AUTOMATED CLINICAL SYSTEM FOR CHROMOSOME ANALYSIS Patent Application

Kenneth Castleman (JPL), Howard J. Frieden (JPL), Elbert T. Johnson (JPL), Paul A. Rennie (JPL), and Raymond J. Wall, Inventors (to NASA) (JPL) Filed 16 May 1976 215 p (Contract NAS7-100)

(NASA-Case-NPO-13913-1; US-Patent-Appl-SN-687251) Avail: NTIS HC A10/MF A01 CSCL 06B

An automatic chromosome analysis system is provided wherein a suitably prepared slide with chromosome spreads thereon is placed on the stage of an automated microscope. The automated microscope stage is computer operated to move the slide to enable detection of chromosome spreads on the slide. The X and Y location of each chromosome spread that is detected is stored. At the conclusion of this searching operation, the computer directs the microscope to again sequence through the chromosome spread locations in response to the stored X and Y locations. NASA



54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

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

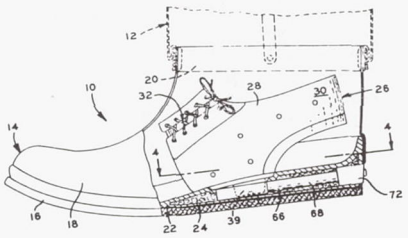
N77-14742*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

A WALKING BOOT ASSEMBLY ***Patent Application***

Hubert C. Vykukal, Alan B. Chambers, and Roy H. StJohn, inventors (to NASA) Filed 23 Dec. 1976 17 p

(NASA-Case-ARC-11101-1; US-Patent-Appl-SN-753976) Avail: NTIS HC A02/MF A01 CSCL 05H

Spacers or liners inserted in the boot components of pressurized spacesuits impair foot ventilation and cause foot discomfort. A walking boot is described which includes a bootie adaptable to the foot of the wearer. A protuberance projected from the bootie fits within a recess in the inner sole of an hermetically sealed boot. Spring loaded latching bolts hold the bootie in place. Multiple wearers or astronauts with varying foot sizes can thus use a single spacesuit. NASA



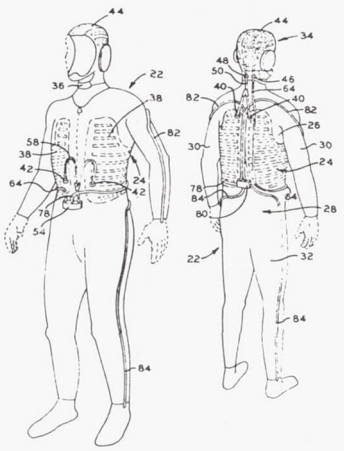
N77-14743*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

AN IMPROVED COOLING SYSTEM FOR REMOVING METABOLIC HEAT FROM AN HERMETICALLY SEALED SPACESUIT **Patent Application**

Bruce W. Webbon, Hubert C. Vykukal, and Bill A. Williams, inventors (to NASA) Filed 23 Dec. 1976 21 p

(NASA-Case-ARC-11059-1; US-Patent-Appl-SN-753978) Avail: NTIS HC A02/MF A01 CSCL 05H

A cooling and ventilating system is designed to achieve greater mobility with increased efficiency in removing metabolic heat, waste gases and water vapor from a spacesuit. The system includes an external life support system to which is attached a body suit with a liquid circulating circuit for establishing a cooling flow of water through the thorax and head sections of the body suit. A gas circulating circuit, including conduits and a helmet duct is provided for establishing a flow of gas throughout the spacesuit whereby gaseous wastes and water vapor are flushed from the suit. Heat, waste gases and water vapor ultimately are dissipated by the life support system. NASA



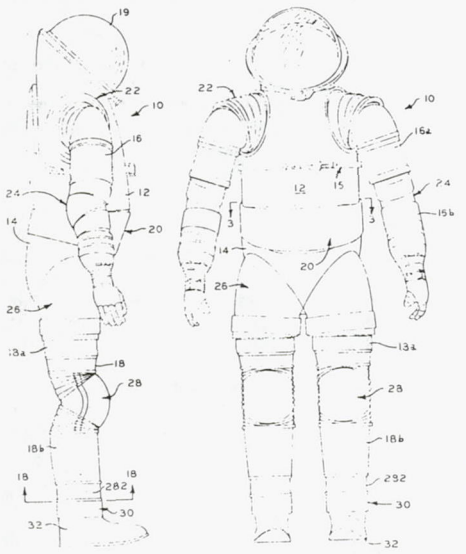
N77-15641*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SPACESUIT MOBILITY JOINTS **Patent Application**

Hubert C. Vykukal, inventor (to NASA) Filed 23 Dec. 1976 47 p

(NASA-Case-ARC-11058-1; US-Patent-Appl-SN-753965) Avail: NTIS HC A02/MF A01 CSCL 05H

Constant volume mobility joints are described for interconnecting adjacent segments of an hermetically sealed spacesuit for relative motion. Each joint includes at least one pair of annuli supported for pivotal displacement about paralleling axes and a flexible, substantially impermeable diaphragm of a tubular configuration spanning the distance between the annuli and connected thereto in an hermetically sealed relationship therewith. The diaphragm includes at least one rolling convolution having a crown disposed in a fixed relation with an axis about which one of the annuli pivots. NASA



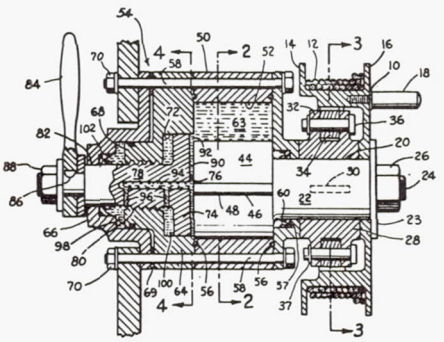
N77-21844* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

EMERGENCY DESCENT DEVICE Patent

Robert R. Belew, inventor (to NASA) Issued 19 Apr. 1977 7 p Filed 16 Oct. 1975 Supersedes N76-13770 (14 - 04, p 0493)

(NASA-Case-MFS-23074-1; US-Patent-4,018,423; US-Patent-Appl-SN-623188; US-Patent-Class-254-158; US-Patent-Class-188-291) Avail: US Patent Office CSCL 13L

A descent device is provided for emergency descent from tall structures and for lowering objects from high elevations, such as a hovering helicopter. The device includes a rotating spool having a cable wound thereon for descent and a rotation-retarding vane member which rotates in a fluid cylinder. An adjustable bypass is provided for the fluid as the vane member rotates therein so that the speed of descent can be adjustably controlled. Official Gazette of the U.S. Patent Office



N77-21847*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

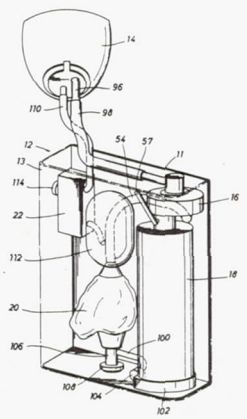
PORTABLE BREATHING SYSTEM Patent Application

John S. Lovell, inventor (to NASA) (Hamilton Standard, Hartford) Filed 24 Mar. 1977 24 p

(Contract NAS9-14458)

(NASA-Case-MSC-16182-1; US-Patent-Appl-SN-780930) Avail: NTIS HC A02/MF A01 CSCL 06K

A semiclosed-loop rebreathing system is provided for use in a hostile environment. The system is characterized by a packed bed regenerative heat exchanger providing two distinct temperature-humidity zones of breathing gas with one zone providing cool, relatively dry air and the second zone providing hot, moist air. Exhaled gas is passed through the packed bed regenerative heat exchanger to increase the temperature and humidity of the gas and is then passed through a sorbent canister containing a lithium hydroxide bed to remove carbon dioxide. The carbon dioxide-free gas is then passed through the regenerative heat exchanger in the reverse direction to cool and dehumidify the gas to normal breathing conditions. NASA



60 COMPUTER OPERATIONS AND HARDWARE

Includes computer graphics and data processing.

For components see *33 Electronics and Electrical Engineering.*

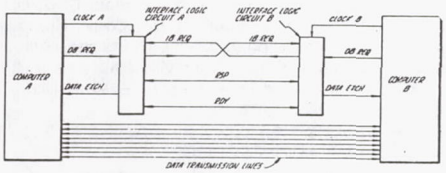
N77-12721* National Aeronautics and Space Administration. Pasadena Office, Calif.

COMPUTER INTERFACE SYSTEM Patent

Tage O. Anderson, inventor (to NASA) (JPL) Issued 26 Oct. 1976 10 p Filed 5 Aug. 1974 Supersedes N74-30549 (12 - 20, p 2388) Sponsored by NASA

(NASA-Case-NPO-13428-1; NASA-Case-NPO-13447-1; US-Patent-3,988,716; US-Patent-Appl-SN-495022; US-Patent-Class-340-172.5; US-Patent-Class-179-15BA; US-Patent-Class-328-111) Avail: US Patent Office CSCL 09B

An interface logic circuit permitting the transfer of information between two computers having asynchronous clocks is disclosed. The information transfer involves utilization of control signals (including request, return-response, ready) to generate properly timed data strobe signals. Noise problems are avoided because each control signal, upon receipt, is verified by at least two clock pulses at the receiving computer. If control signals are verified, a data strobe pulse is generated to accomplish a data transfer. Once initiated, the data strobe signal is properly completed independently of signal disturbances in the control signal initiating the data strobe signal. Completion of the data strobe signal is announced by automatic turn-off of a return-response control signal. Author



N77-14751* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

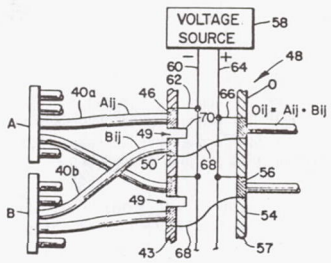
TWO-DIMENSIONAL RADIANT ENERGY ARRAY COMPUTERS AND COMPUTING DEVICES Patent

David H. Schaefer and James P. Strong, inventors (to NASA) Issued 7 Dec. 1976 31 p Filed 8 May 1974

(NASA-Case-GSC-11839-1; US-Patent-3,996,455; US-Patent-Appl-SN-468614; US-Patent-Class-235-152; US-Patent-Class-250-227; US-Patent-Class-340-172.5; US-Patent-Class-350-96R) Avail: US Patent Office CSCL 09B

Two dimensional digital computers and computer devices operate in parallel on rectangular arrays of digital radiant energy optical signal elements which are arranged in ordered rows and columns. Logic gate devices receive two input arrays and provide an output array having digital states dependent only on the digital states of the signal elements of the two input arrays at corresponding row and column positions. The logic devices include an array of photoconductors responsive to at least one of the input arrays for either selectively accelerating electrons to a phosphor output surface, applying potentials to an electroluminescent output layer, exciting an array of discrete radiant energy

sources, or exciting a liquid crystal to influence crystal transparency or reflectivity. Official Gazette of the U.S. Patent Office



N77-19760* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

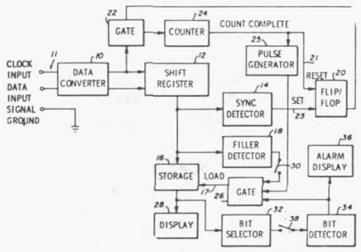
SELECTIVE DATA SEGMENT MONITORING SYSTEM Patent

Manfred N. Wirth, inventor (to NASA) Issued 2 Nov. 1976 9 p Filed 12 May 1975 Supersedes N75-25127 (13 - 16, p 1965)

(NASA-Case-ARC-10899-1; US-Patent-3,990,049; US-Patent-Appl-SN-576774; US-Patent-Class-340-172.5; US-Patent-Class-178-69.5R; US-Patent-Class-179-15BS) Avail: US Patent Office CSCL 09B

High speed data monitoring apparatus is described for displaying the bit pattern of a selected portion of a block of transmitted data comprising a shift register for receiving the transmitted data and for temporarily containing the consecutive data bits. A programmable sync detector for monitoring the contents of the shift register and for generating a sync signal when the shift register contains a predetermined sync code is included. A counter is described for counting the data bits input to the shift register after the sync signal is generated and for generating a count complete signal when a selected number of data bits have been input to the register. A data storage device is used for storing the contents of the shift register at the time the count complete signal is generated.

Official Gazette of the U.S. Patent Office



73 NUCLEAR AND HIGH-ENERGY PHYSICS

Includes elementary and nuclear particles; and reactor theory.

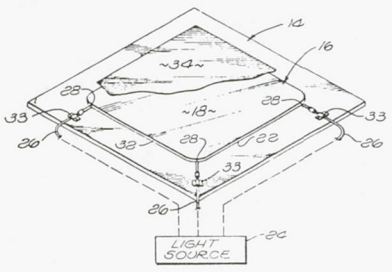
For space radiation see *93 Space Radiation.*

N77-10899* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

WINDOW DEFECT PLANAR MAPPING TECHNIQUE Patent

Fred R. Minton (Rockwell Intern. Corp., Downey, Calif.) and Uel O. Minton, inventors (to NASA) (Rockwell Intern. Corp., Downey, Calif.) Issued 12 Oct. 1976 4 p Filed 14 Mar. 1975 Supersedes N75-22119 (13 - 13, p 1576) Sponsored by NASA (NASA-Case-MSC-19442-1; US-Patent-3,985,454; US-Patent-Appl-SN-558600; US-Patent-Class-356-237; US-Patent-Class-356-239) Avail: US Patent Office CSCL 20F

A method of planar mapping defects in a window having an edge surface and a planar surface. The method is comprised of steps for mounting the window on a support surface. Then a light sensitive paper is placed adjacent to the window surface. A light source is positioned adjacent to the window edge. The window is then illuminated with the source of light for a predetermined interval of time. Defects on the surface of the glass, as well as in the interior of the glass are detected by analyzing the developed light sensitive paper. The light source must be in the form of optical fibers or a light tube whose light transmitting ends are placed near the edge surface of the window. Official Gazette of the U.S. Patent Office



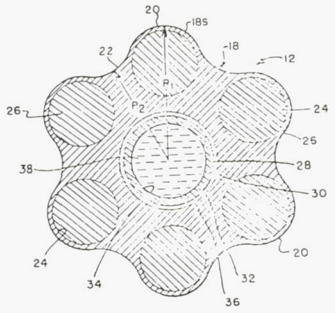
N77-18891* National Aeronautics and Space Administration. Pasadena Office, Calif.

NUCLEAR THERMIONIC CONVERTER Patent

Wayne M. Phillips (JPL) and Jack F. Mondt, inventors (to NASA) (JPL) Issued 15 Feb. 1977 5 p Filed 3 Oct. 1972 Supersedes N73-12702 (11 - 03, p 0332) Sponsored by NASA (NASA-Case-NPO-13121-1; US-Patent-4,008,407; US-Patent-Appl-SN-294727; US-Patent-Class-310-4R; US-Patent-Class-313-311; US-Patent-Class-346R) Avail: US Patent Office CSCL 10B

Efficient nuclear reactor thermionic converter units are described which can be constructed at low cost and assembled in a reactor which requires a minimum of fuel. Each converter unit utilizes an emitter rod with a fluted exterior, several fuel passages located in the bulges that are formed in the rod between the flutes, and a collector receiving passage formed through the center of the rod. An array of rods is closely packed in an interfitting arrangement, with the bulges of the rods received in the recesses formed between the bulges of other rods, thereby closely packing the nuclear fuel. The rods are constructed of a mixture of tungsten and thorium oxide to provide high power output, high efficiency, high strength, and good machinability.

Official Gazette of the U.S. Patent Office



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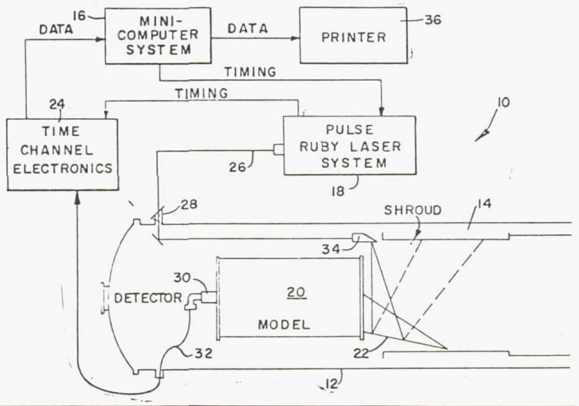
Includes light phenomena.

N77-14842*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SYSTEM FOR THE MEASUREMENT OF ULTRA-LOW STRAY LIGHT LEVELS Patent Application

Charles L. Wyman, inventor (to NASA), Donald B. Griner, Charles A. Hawkins, Gary H. Hunt (Sperry Rand Corp., Huntsville, Ala.), William A. Hurd (Sperry Rand Corp., Huntsville, Ala.), Glen B. Shelton (Sperry Rand Corp., Huntsville, Ala.), Bill B. Fannin (Arizona Univ., Tucson), and Robert P. Breault (Arizona Univ., Tucson) Filed 29 Dec. 1976 22 p (NASA-Case-MFS-23513-1; US-Patent-Appl-SN-755323) Avail: NTIS HC A02/MF A01 CSCL 20F

An apparatus for measuring the effectiveness of stray light suppression light shields and baffle arrangements used in optical space experiments is described. The light shield and baffle arrangement and a telescope model are contained in a vacuum chamber. A source of short, high powered light energy illuminates portions of the light shield and baffle arrangement and reflects the light to a photomultiplier tube by virtue of multipath scattering. NASA



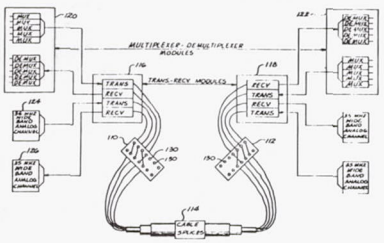
N77-15826*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

FIBER OPTIC MULTIPLEX OPTICAL TRANSMISSION SYSTEM Patent Application

Charles H. Bell, inventor (to NASA) *Filed 18 Aug. 1976* 20 p

(NASA-Case-KSC-11047-1; US-Patent-Appl-SN-715485) Avail: NTIS HC A02/MF A01 CSCL 20F

A multiplex optical transmission system for simultaneously transmitting and receiving a number of signals while minimizing external interference is described. The system includes several subgroup mixers which block video signals, digital data signals, and audio signals into respective frequency ranges. The output of the subgroup mixers are fed to a master mixer that produces a composite electrical signal. An optical transmitter is connected to the master mixer for converting the composite signal into an optical signal and transmitting the optical signal over a fiber optic cable. An optical receiver is connected to the other end of the fiber optic cable for receiving the optical signal and converting it back into a composite electrical signal. A demultiplexer is coupled to the output of the optical receiver for separating the composite signal back into video, data, and audio signals. A programmable optical patch board selectively connects the optical signals to various receivers and transmitters. NASA



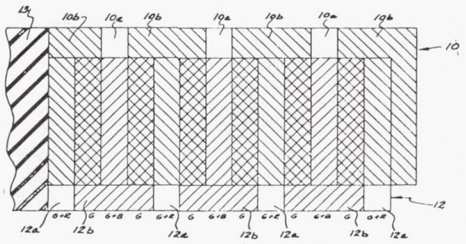
N77-18893* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

SYSTEM FOR PRODUCING CHROMA SIGNALS Patent

Kenneth H. Vorhaben (Lockheed Electronics Co., Houston, Tex.) and Phillip C. Lipoma, inventors (to NASA) (Lockheed Electronics Co., Houston, Tex.) Issued 18 Jan. 1977 3 p Filed 12 Sep. 1975 Supersedes N75-33835 (13 - 24, p 3102) Sponsored by NASA

(NASA-Case-MSC-14683-1; US-Patent-4,004,292; US-Patent-Appl-SN-612967; US-Patent-Class-358-44) Avail: US Patent Office CSCL 20F

A method for obtaining electronic chroma signals with a single scanning-type image device is described. A color multiplexed light signal is produced using an arrangement of dichroic filter stripes. In the particular system described, a two layer filter is used to color modulate external light which is then detected by an image pickup tube. The resulting time division multiplexed electronic signal from the pickup tube is converted by a decoder into a green color signal, and a single red-blue multiplexed signal, which is demultiplexed to produce red and blue color signals. The three primary color signals can be encoded as standard NTSC color signals. Official Gazette of the U. S. Patent Office.



N77-20882* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

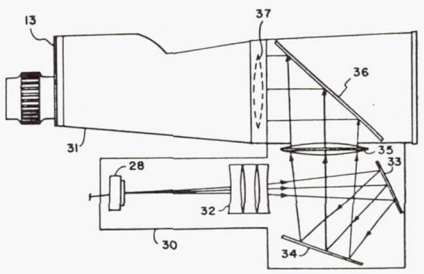
BINOCULAR DEVICE FOR DISPLAYING NUMERICAL INFORMATION IN FIELD OF VIEW Patent

Harry V. Fuller, inventor (to NASA) Issued 15 Mar. 1977 6 p Filed 28 Aug. 1975 Supersedes N75-30516 (13 - 21, p 2672)

(NASA-Case-LAR-11782-1; US-Patent-4,012,123; US-Patent-Appl-SN-608482; US-Patent-Class-350-174; US-Patent-Class-350-145) Avail: US Patent Office CSCL 20F

An apparatus is described for superimposing numerical information on the field of view of binoculars. The invention has application in the flying of radio-controlled model airplanes. Information such as airspeed and angle of attack are sensed on a model airplane and transmitted back to earth where this information is changed into numerical form. Optical means are attached to the binoculars that a pilot is using to track the model air plane for displaying the numerical information in the field of view of the binoculars. The device includes means for focusing the numerical information at infinity whereby the user of the binoculars can see both the field of view and the numerical information without refocusing his eyes.

Official Gazette of the U.S. Patent Office



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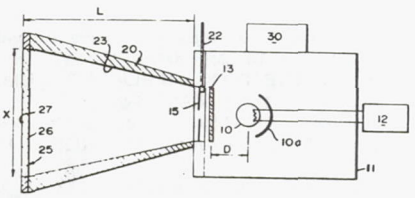
N77-21941* National Aeronautics and Space Administration. Pasadena Office, Calif.

UNIFORM VARIABLE LIGHT SOURCE Patent

Henry P. Squyres, inventor (to NASA) (JPL) Issued 16 Jan. 1973 7 p Filed 4 Dec. 1970 Sponsored by NASA (NASA-Case-NPO-11429-1; US-Patent-3,711,701; US-Patent-Appl-SN-95189; US-Patent-Class-240-46.13; US-Patent-Class-240-41R; US-Patent-Class-240-41.35R; US-Patent-Class-356-236) Avail: US Patent Office CSCL 20F

A uniform stable light source comprising a special lamp with a built in reflector is described. The light projects stable and uniform luminous flux with unvarying spectral characteristics with a distribution temperature of about 3000 K. The uniform luminous flux flows into a conical cavity through an iris diaphragm whose diameter is controllable. A uniform light diffuser is positioned at the opposite end of the conical cavity. The level of luminance which is transmitted through the diffuser is controlled by controlling the diaphragm diameter.

Official Gazette of the U.S. Patent Office



85 URBAN TECHNOLOGY AND TRANSPORTATION

Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation. For related information see *03 Air Transportation and Safety, 16 Space Transportation,* and *44 Energy Production and Conversion.*

N77-17949*# National Aeronautics and Space Administration. Pasadena Office, Calif.

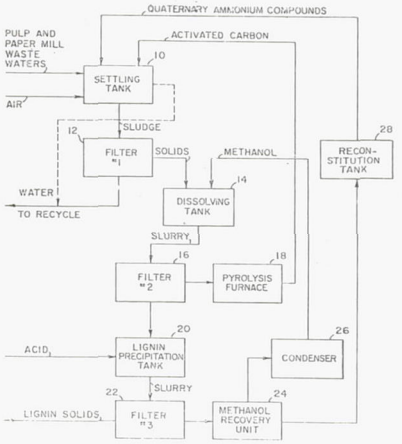
PROCESS FOR PURIFICATION OF WASTE WATER PRODUCED BY A KRAFT PROCESS PULP AND PAPER MILL Patent Application

Marshall Humphrey, inventor (to NASA) (JPL) Filed 15 Dec. 1976 13 p

(Contract NAS7-100)

(NASA-Case-NPO-13847-2; NASA-Case-NPO-13848-2; US-Patent-Appl-SN-750798) Avail: NTIS HC A02/MF A01 CSCL 13B

A method and means for purifying the waste water from paper and pulp mill wastes obtained from a mill using the Kraft process were ascertained. Lignins and lignin derivatives were precipitated from the waste stream with quaternary ammonium compounds, removing other impurities by activated carbon produced from the cellulosic components of the waste, and thereafter separating water from the precipitate and solids. The activated carbon also acted as an aid to the separation of the water and solids. The precipitate containing the lignins and quaternary ammonium compound was dissolved in methanol to recover lignins. Upon acidification, the lignin was precipitated from the solution. The methanol and quaternary ammonium compound were recovered for reuse from the remainder. NASA



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15. Supplementary Notes

Section 1 - Abstracts

16. Abstract

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