NASA SP-7039(18)
Section 1
Abstracts

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

JANUARY 1981

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA SP-7039(18) NASA Patent Abstracts Bibliography (Section 1 • Abstracts) JANUARY 1981

ACCESSION NUMBER RANGES

Bibliography Number	*STAR Accession Numbers*
NASA SP-7039(04)	N69-20701–N73-33931
NASA SP-7039(12)	N74-10001–N77-34042
NASA SP-7039(13)	N78-10001–N78-22018
NASA SP-7039(14)	N78-22019–N78-34034
NASA SP-7039(15)	N79-10001–N79-21993
NASA SP-7039(16)	N79-21994–N79-34158
NASA SP-7039(17)	N80-10001–N80-22254
NASA SP-7039(18)	N80-22255–N80-34339

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

NASA

PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

Annotated references to NASA-owned inventions covered by U.S. patents and applications for patent that were announced in *Scientific and Technical Aerospace Reports (STAR)* between July 1980 and December 1980.

Scientific and Technical Information Office JANUARY 1981
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C.

This supplement is available as NTISUB/111/093 from the National Technical Information Service (NTIS), Springfield, Virginia 22161 at the price of $8.50 domestic; $17.50 foreign for standing orders. Please note: Standing orders are subscriptions which do not terminate at the end of a year, as do regular subscriptions, but continue indefinitely unless specifically terminated by the subscriber.

INTRODUCTION

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

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

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

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

The 120 citations published in this issue of the Abstract Section cover the period July 1980 through December 1980. The Index Section references approximately 3900 citations covering the period May 1969 through December 1980.

ABSTRACT SECTION (SECTION 1)

This *PAB* issue incorporates the 1975 *STAR* category revisions which include 10 major subdivisions divided into 74 specific categories and one general category/division. (See Table of Contents for the scope note of each category under which are grouped appropriate NASA inventions.) This new scheme was devised in lieu of the 34 category divisions which were utilized in *PAB* supplements (01) through (06) covering *STAR* abstracts from May 1969 through January 1974. Each entry in the Abstract Section consists of a *STAR* citation accompanied by an abstract and a key illustration taken from the patent or application for patent drawing. Entries are arranged in subject category in order of the ascending NASA Accession Number originally assigned in *STAR* to the invention. The range of NASA Accession Numbers within each issue is printed on the inside front cover.

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

NASA Accession Number
NASA Case Number
Inventor's Name

Title of Invention
U.S. Patent Application Serial Number
U.S. Patent Number (for issued patents only)
U.S. Patent Office Classification Number(s)
(for issued patents only)

These data elements in the citation of the abstract as depicted in the Typical Citation and Abstract reproduced below and are also used in the several indexes.

TYPICAL CITATION AND ABSTRACT

NASA SPONSORED DOCUMENT

AVAILABLE ON MICROFICHE

NASA ACCESSION NUMBER

N80-20574*# National Aeronautics and Space Administration. Pasadena Office, Calif.

SOURCE

TITLE

METHOD AND APPARATUS FOR CONVECTION CONTROL OF METALLIC HALIDE VAPOR DENSITY IN A METALLIC HALIDE LASER Patent Application

INVENTOR

Thomas J. Pivirotto, inventor (to NASA) (JPL) Filed 14 Mar. 1980 14 p

(Contract NAS7-100)

US PATENT APPLICATIONS SERIAL NUMBER

(NASA-Case-NPO-15021-1; US-Patent-Appl-SN-130496) Avail:

AVAILABILITY

NTIS HC A02/MF A01 CSCL 20E

COSATI CODE

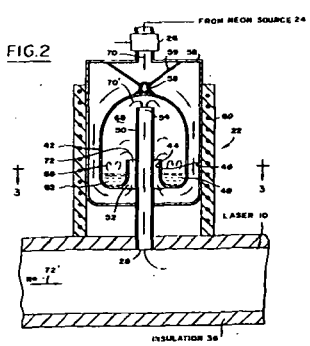
NASA CASE NUMBER

ABSTRACT

A method and apparatus for convection control of metallic halide vapor density in a metallic halide laser are described. A reservoir containing copper chloride is heated so that the copper chloride is maintained in a liquid form. The apparatus includes a means for flowing a buffer gas (neon) over the liquid copper chloride to provide a mixture of copper chloride vapor and neon above the liquid copper chloride. A conduit for providing fluid communication between the reservoir containing the copper chloride vapor/neon mixture and the laser is also included. The copper chloride vapor density in the laser is related to the liquid copper chloride temperature and the neon flow rate through the reservoir. Neon is also provided directly to the laser in order to provide a further means of controlling the copper chloride vapor density in the laser.

NASA

KEY ILLUSTRATION



INDEX SECTION (SECTION 2)

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

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

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

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

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

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

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

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

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

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

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

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

PUBLIC AVAILABILITY OF COPIES OF PATENTS AND PATENT APPLICATIONS

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

NASA *patent application specifications* are sold in paper copy by the National Technical Information Service at price code A02 ($5.00 domestic; $10.00 foreign). Microfiche are sold at price code A01 ($3.50 domestic; $7.00 foreign). The US-Patent-Appl-SN-number should be used in ordering either paper copy or microfiche from NTIS.

LICENSES FOR COMMERCIAL USE: INQUIRIES AND APPLICATIONS FOR LICENSE

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

Inquiries concerning the NASA Patent Licensing Program or the availability of licenses for the commercial use of NASA-owned inventions covered by U.S. patents or pending applications for patent should be forwarded to the NASA Patent Counsel of the NASA installation having cognizance of the specific invention, or the Assistant General Counsel for Patent Matters, Code GP-4, National Aeronautics and Space Administration, Washington, D.C. 20546. Inquiries should refer to the NASA Case Number, the Title of the Invention, and the U.S. Patent Number or the U.S. Application Serial Number assigned to the invention as shown in *NASA PAB*.

The NASA Patent Counsel having cognizance of the invention is determined by the first three letters or prefix of the NASA Case Number assigned to the invention. The addresses of NASA Patent Counsels are listed alongside the NASA Case Number prefix letters in the following table. Formal application of license must be submitted on the NASA Form, Application for NASA Patent License, which is available upon request from any NASA Patent Counsel.

NASA Case Number Prefix Letters	Address of Cognizant NASA Patent Counsel
ARC-xxxxx XAR-xxxxx	Ames Research Center Mail Code: 200-11A Moffett Field, California 94035 Telephone: (415)965-5104
ERC-xxxxx XER-xxxxx HQN-xxxxx XHQ-xxxxx	NASA Headquarters Mail Code: GP-4 Washington, D.C. 20546 Telephone: (202)755-3954
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301)344-7351
KSC-xxxxx XKS-xxxxx	John F. Kennedy Space Center Mail Code: AA-PAT Kennedy Space Center, Florida 32899 Telephone: (305)867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code: 456 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

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. For abstracts of NASA-owned inventions available for licensing in countries other than the United States, see NASA SP-7038, "Significant NASA Inventions Available for Licensing in Countries Other Than the United States." A copy of this NASA publication is available from NASA Headquarters, Code GP-4, Washington, D.C., 20546.

TABLE OF CONTENTS
Section 1 • Abstracts

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 **3 1**
Includes atomic structure and molecular spectra.

73 NUCLEAR AND HIGH-ENERGY PHYSICS **N.A.**
Includes elementary and nuclear particles; and reactor theory.
For space radiation see *93 Space Radiation*.

74 OPTICS **31**
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 **33**
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 **34**
Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.
For related information see *03 Air Transportation and Safety*, *16 Space Transportation*, and *44 Energy Production and Conversion*.

SPACE SCIENCES

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

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

89 ASTRONOMY **N.A.**
Includes radio and gamma-ray astronomy; celestial mechanics; and astrometry.

90 ASTROPHYSICS **N.A.**
Includes cosmology; and interstellar and interplanetary gases and dust.

91 LUNAR AND PLANETARY EXPLORATION **N.A.**
Includes planetology; and manned and unmanned flights.
For spacecraft design see *18 Spacecraft Design, Testing and Performance*. For space stations see *15 Launch Vehicles and Space Vehicles*.

92 SOLAR PHYSICS **N.A.**
Includes solar activity, solar flares, solar radiation and sunspots.

93 SPACE RADIATION **N.A.**
Includes cosmic radiation; and inner and outer earth's radiation belts.
For biological effects of radiation see *52 Aerospace Medicine*. For theory see *73 Nuclear and High-Energy Physics*.

GENERAL

99 GENERAL **N.A.**

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

Section 2 • Indexes

JANUARY 1981 (Supplement 18)

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.*

N80-28300* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

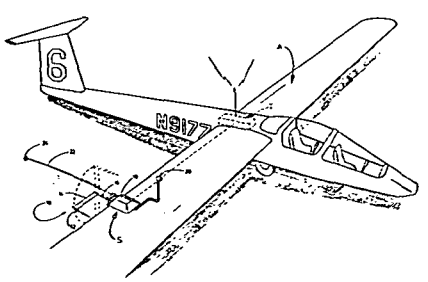
SYSTEM FOR USE IN CONDUCTING WAKE INVESTIGATION FOR A WING IN FLIGHT Patent

Paul F. Bikle, inventors (to NASA) and Lawrence C. Montoya Issued 15 Jul. 1980 9 p Filed 28 Feb. 1979 Supersedes N79-17797 (17 - 09, p 1069)

(NASA-Case-FRC-11024-1; US-Patent-4,212,199; US-Patent-Appl-SN-015983; US-Patent-Class-73-861.66; US-Patent-Class-73-180; US-Patent-Class-73-182; US-Patent-Class-73-861.65) Avail: US Patent and Trademark Office CSCL 01A

A system supported by a wing in flight is described which has a reference total pressure port in spaced relation with a wake as the wake is generated by the wing, a reference static pressure port supported in spaced relation with the wake, and a probe adapted to be displaced along an accurate path through the wake including a total pressure port and static pressure ports. A differential pressure transducer and a pressure switching device are interposed between the ports and the transducer is provided for selectively connecting pairs of the ports to the transducer in opposed relation, whereby a single transducer is utilized to obtain differential pressure measurement for the wake with enhanced accuracy.

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



04 AIRCRAFT COMMUNICATIONS AND NAVIGATION

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

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

N80-32359* National Aeronautics and Space Administration. Pasadena Office, Calif.

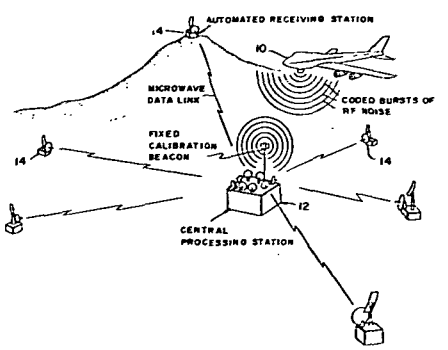
INTERFEROMETRIC LOCATING SYSTEM Patent

Peter F. MacDoran, inventor (to NASA) (JPL) Issued 29 Jul. 1980 10 p Filed 31 Aug. 1978 Supersedes N79-10039 (17 - 01, p 0006) Sponsored by NASA

(NASA-Case-NPO-14173-1; US-Patent-4,215,345; US-Patent-Appl-SN-938581; US-Patent-Class-343-112R) Avail: US Patent and Trademark Office CSCL 17G

A system is described for determining the position of a vehicle or other target that emits radio waves and which is of the type that senses the difference in time of arrival at spaced ground stations of signals from the vehicle to locate the vehicle on a set of intersecting hyperbolas. A network of four ground stations detects the radio emissions from the vehicle and by means of cross correlation derives the relative signal delay at the ground stations from which the vehicle position is deduced. Because the signal detection is by cross correlation, no knowledge of the emission is needed, which makes even unintentional radio noise emissions usable as a locator beacon. By positioning one of the four ground stations at an elevation significantly above the plane of the other three stations, a three dimensional fix on the vehicle is possible.

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



07 AIRCRAFT PROPULSION AND POWER

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

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

N80-26298* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

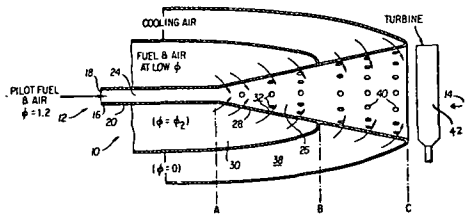
REDUCTION OF NITRIC OXIDE EMISSIONS FROM A COMBUSTOR Patent

Roger A. Craig and Huw O. Pritchard, inventors (to NASA) Issued 27 May 1980 6 p Filed 8 Sep. 1977 Supersedes N77-31260 (15 - 22, p 2912) Continuation of abandoned US Patent Appl. SN-684045, filed 7 May 1976

(NASA-Case-ARC-10814-2; US-Patent-4,204,402; US-Patent-Appl-SN-831632; US-Patent-Class-60-39.06; US-Patent-Class-60-733; US-Patent-Class-60-746; US-Patent-Appl-SN-684045) Avail: US Patent and Trademark Office CSCL 21E

A turbojet combustor and method for controlling nitric oxide emissions by employing successive combustion zones is described. After combustion of an initial portion of the fuel in a primary combustion zone, the combustion products of the primary zone are combined with the remaining portion of fuel and additional plenum air and burned in a secondary combustion zone under conditions that result in low nitric oxide emissions. Low nitric oxide emissions are achieved by a novel turbojet combustor arrangement which provides flame stability by allowing stable combustion to be accompanied by low nitric oxide emissions resulting from controlled fuel-lean combustion (ignited by the emission products from the primary zone) in a secondary combustion zone at a lower combustion temperature resulting in low emission of nitric oxide.

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



N80-32392* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

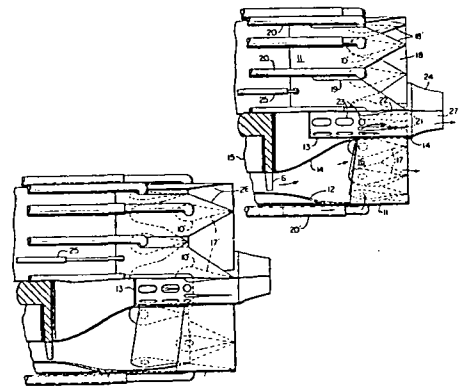
AIRCRAFT ENGINE NOZZLE Patent

Norman E. Sorensen and Eldon A. Latham, inventors (to NASA) Issued 29 Jul. 1980 7 p Filed 23 Mar. 1979 Supersedes N79-23971 (17 - 15, p 1934)

(NASA-Case-ARC-10977-1; US-Patent-4,214,703; US-Patent-Appl-SN-023436; US-Patent-Class-239-127.3; US-Patent-Class-60-264; US-Patent-Class-239-265.33) Avail: US Patent and Trademark Office CSCL 21E

A variable area exit nozzle arrangement for an aircraft engine was a substantially reduced length and weight which comprises a number of longitudinally movable radial vanes and a number of fixed radial vanes. The movable radial vanes are alternately disposed with respect to the fixed radial vanes. A means is provided for displacing the movable vanes along the longitudinal axis of the engine relative to the fixed radial vanes which extend across the main exhaust flow of the engine.

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



N80-32393*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

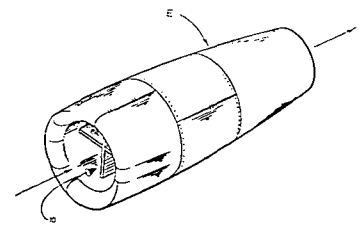
MULTIPLE PURE TONE ELIMINATION STRUT ASSEMBLY Patent Application

Frank W. Burcham, Jr., inventor (to NASA) Filed 11 Sep. 1980 9 p

(NASA-Case-FRC-11062-1; US-Patent-Appl-SN-185869) Avail: NTIS HC A02/MF A01 CSCL 21E

An acoustic noise elimination assembly is described which has a capability for disrupting the continuity of fields of sound pressures forwardly projected from fans or rotors of a type commonly found in the fan or compressor first stage for airbreathing engines when operating at top speeds in the supersonic range. The assembly includes a tubular cowl defining a duct for delivering an airstream axially into the intake for a jet engine and a sound barrier defined by a plurality of intersecting flat plates or struts, having a line of intersection coincident with a longitudinal axis of the tubular cowl which serves to disrupt the continuity of rotating fields of multiple pure tonal components of noise.

NASA

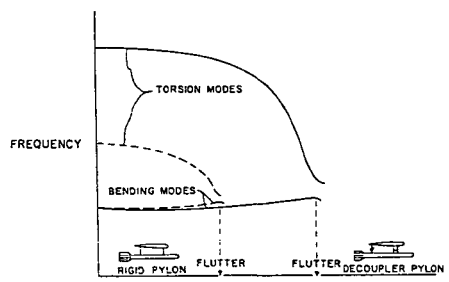


08 AIRCRAFT STABILITY AND CONTROL

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

N80-22359*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
DECOUPLER PYLON: WING/STORE FLUTTER SUPPRESSOR Patent Application
Wilmer A. Reed, III, inventor (to NASA) Filed 28 Mar. 1980 18 p
(NASA-Case-LAR-12468-1; US-Patent-Appl-SN-135057) Avail: NTIS HC A02/MF A01 CSCL 01C

A device for suspending a store from a support such as an aircraft wing is described. It comprises soft-spring means whereby the store pitch mode is decoupled from support modes and a low frequency active control mechanism which maintains store alignment. In the described embodiment, a pneumatic suspension system both isolates the store in pitch and, under conditions of changing mean load, aligns the store with the wing to which it is attached. The device allows the flutter speed of an aircraft flying with an attached store to be increased while reducing the sensitivity of flutter to changes in the pitch inertia and center of gravity location of the store. NASA



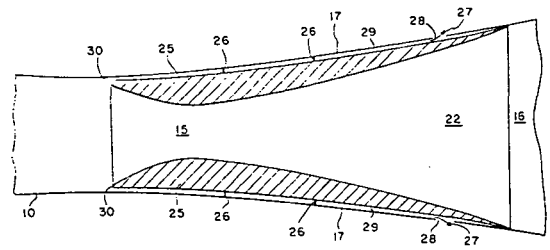
09 RESEARCH AND SUPPORT FACILITIES (AIR)

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).*

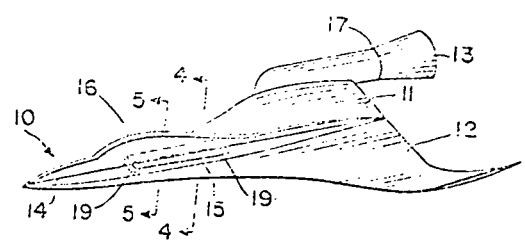
N80-22369*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
WIND TUNNEL SUPPLEMENTARY MACH NUMBER MINIMUM SECTION INSERT Patent Application
Lana M. Couch, inventor (to NASA) Filed 28 Mar. 1980 12 p
(NASA-Case-LAR-12532-1; US-Patent-Appl-SN-135040) Avail: NTIS HC A02/MF A01 CSCL 14B

A device which changes the Mach number capability of a wind tunnel without permanently altering the existing nozzle of the tunnel is described. An insert is attached to the wall of the existing nozzle expansion area creating a second minimum section upstream of the model test section. The added insert may be removed without complicated and expensive changes to the basic wind tunnel. In the embodiment illustrated, a removable insert is disposed within the wind tunnel nozzle walls with a portion of the flow boundary layer being bled off from the tunnel via a passageway and tunnel exit to reduce the extent of separated flow normally occuring upstream of the insert contraction section. NASA



N80-24334*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
METRIC HALF-SPAN MODEL SUPPORT SYSTEM Patent Application
Charlie M. Jackson, Jr., Samuel M. Dollyhigh, and David S. Shaw, inventors (to NASA) Filed 30 Apr. 1980 11 p
(NASA-Case-LAR-12441-1; US-Patent-Appl-SN-145210) Avail: NTIS HC A02/MF A01 CSCL 01E

A model support system used to support a model in a wind tunnel test section is described. The model comprises a metric, or measured, half-span supported by a nonmetric, or nonmeasured, half-span which is connected to a sting support. Moments and forces acting on the metric half-span are measured without interference from the support system during a wind tunnel test. 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)*.

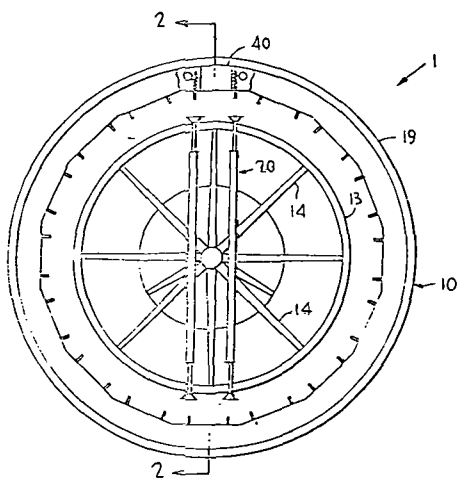
N80-24342*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

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

Robert R. Belew, inventor (to NASA) Filed 30 Apr. 1980 20 p

(NASA-Case-MFS-23825-1; US-Patent-APPL-SN-145273) Avail: NTIS HC A02/MF A01 CSCL 06B

A bioresearch centrifuge system for subjecting caged animals to long term centrifugal forces that create gravity conditions aboard orbiting spacecraft is disclosed. The biocentrifuge system is comprised of a centrifuge carrying a plurality of removable and replaceable cages for the animal specimens. Pairs of opposing cages may be removed from the frame while it is rotating, by means of a cage exchanger which rotates concentrically within the centrifuge and the speed of which is controlled independently of the frame speed. An image rotator is provided for selective observation of the rotating animals. The system further includes a waste conveyor system, a food supply system, and a water supply system for each cage for creating a life sustaining environment so that the animals can live in the rotating centrifuge for extended periods. The rotating cage exchanger can also be used to selectively remove containers from various other centrifuges or other rotatable frame structures. NASA



23 CHEMISTRY AND MATERIALS (GENERAL)

Includes biochemistry and organic chemistry.

N80-26386*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PREPARATION OF PERFLUORINATED IMIDOYLAMIDOXIMES Patent Application

Reinhold H. Kratzer (Ultrasystems, Inc., Irvine, Calif.), Kazimiera J. L. Paciorek (Ultrasystems, Inc., Irvine, Calif.), Thomas I. Ito (Ultrasystems, Inc., Irvine, Calif.), and Robert W. Rosser, inventors (to NASA) Filed 27 Jun. 1980 8 p

(NASA-Case-ARC-11267-1; US-Patent-Appl-SN-163839) Avail: NTIS HC A02/MF A01 CSCL 07C

A method of preparing perfluorinated imidoylamidoximes is disclosed. The imidoylamidoximes are synthesized by the condensation of a perfluorinated nitrile with a perfluorinated amidoxime in vacuo or in an inert atmosphere at a temperature within the range of about 20 to 70 C for a period of 24 to 240 hours. When both the nitrile and the amidoxime reactants are difunctional, oligomeric or polymeric product are obtained, which, after cyclization of the imidoylamidoxime groups to 1,2,4-oxadiazole linkages, yield excellent heat, chemical, and solvent resistant elastomers. NASA

N80-31472*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

AN IMPROVED SYNTHESIS OF 2,4,8,10-TETROXASPIRO (5.5) UNDECANE Patent Application

Algirdas C. Poshkus, inventor (to NASA) (National Academy of Sciences - National Research Council, Washington, D.C.) Filed 3 Sep. 1980 10 p Sponsored by NASA

(NASA-Case-ARC-11243-2; US-Patent-Appl-SN-183707) Avail: NTIS HC A02/MF A01 CSCL 07C

Pentaerythritol can be converted to its diformal, 2,4,8, 10 -tetroxaspiro (5.5) lundecane, by heating it ot a temperature within of about 110 to 150 C for a period of up to 10 minutes, in the presence of a slight excess of paraformaldehyde and of a catalytic quantity of an acid catalyst such as sulfuric acid. The reaction may be carried out in two steps, by forming first the monoformal, then the diformal. In any case, total reaction time is about 10 minutes and yield of diformal are greater than 90 percent. Several advantages of the improved process in terms of shortened reaction times, yields labor and energy requirements, adaptability to continuous operation, and overall simplicity and convenience are discussed. NASA

24 COMPOSITE MATERIALS

Includes laminates.

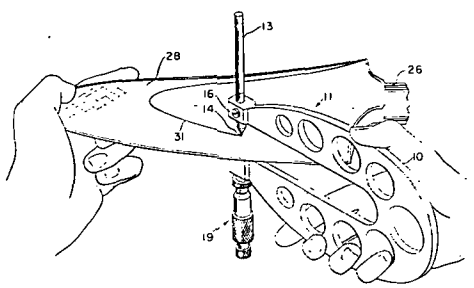
N80-22410*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

METHOD FOR MAKING PATTERNS FOR RESIN MATRIX COMPOSITES Patent Application

Manuel J. Fontes, inventor (to NASA) Filed 2 Apr. 1980 13 p

(NASA-Case-ARC-11246-1; US-Patent-Appl-SN-136660) Avail: NTIS HC A02/MF A01 CSCL 11D

A method for making laminate patterns for a resin matrix composite structural component is described. A sheet of paper is temporarily adhered to a model of the structural component. A tracer pen is positioned on the paper with an affixed spindle touching the model surface opposite the pen. The pen and spindle are moved along the path that maintains the aforementioned contacts. The resulting line traced on paper is a model constant thickness locus and provides a pattern for a single lamination of resin-impregnated fabric. The steps are repeated to make other patterns and each time the steps are repeated the distance between the tracer and the spindle is changed to correspond to the thickness of a lamination. NASA



N80-26388* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

CORK-RESIN ABLATIVE INSULATION FOR COMPLEX SURFACES AND METHOD FOR APPLYING THE SAME Patent

Hill M. Walker, Max H. Sharpe, and William G. Simpson, inventors (to NASA) Issued 27 May 1980 3 p Filed 12 Sep. 1978 Supersedes N78-32190 (16 - 23, p 3052)

(NASA-Case-MFS-23626-1; US-Patent-4,204,899; US-Patent-Appl-SN-941711; US-Patent-Class-156-212; US-Patent-Class-156-213; US-Patent-Class-156-285; US-Patent-Class-264-118; US-Patent-Class-264-119; US-Patent-Class-264-124; US-Patent-Class-260-17.2) Avail: US Patent and Trademark Office CSCL 11D

A method of applying cork-resin ablative insulation material to complex curved surfaces is disclosed. The material is prepared by mixing finely divided cork with a B-stage curable thermosetting resin, forming the resulting mixture into a block, B-stage curing the resin-containing block, and slicing the block into sheets. The B-stage cured sheet is shaped to conform to the surface being insulated, and further curing is then performed. Curing of the resins only to B-stage before shaping enables application of sheet material to complex curved surfaces and avoids limitations and disadvantages presented in handling of fully cured sheet material.

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

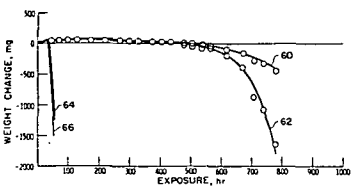
N80-26389*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

A SILICON-SLURRY/ALUMINIDE COATING Patent Application

D. L. Deadmore and S. G. Young, inventors (to NASA) Filed 20 Jun. 1980 11 p

(NASA-Case-LEW-13343-1; US-Patent-Appl-SN-161254) Avail: NTIS HC A02/MF A01 CSCL 11D

A low cost coating is disclosed which protects metallic base system substrates from high temperatures, high gas velocity oxidation, thermal fatigue and hot corrosion. The coating is particularly useful for protecting vanes and blades in aircraft and land based gas turbine engines. A lacquer slurry comprising cellulose nitrate containing high purity silicon powder is sprayed onto the superalloy substrates. The silicon layer is then aluminized to complete the coating. The Si-Al coating is less costly to produce than advanced aluminides and protects the substrate from oxidation and thermal fatigue for a much longer period of time than the conventional aluminide coatings. While more expensive Pt-Al coatings and physical vapor deposited MCrALY coatings on certain superalloys in high gas velocity oxidation and thermal fatigue. Also, the Si-Al coating increased the resistance of certain superalloys to hot corrosion. NASA



N80-33482* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

METHOD OF MAKING BEARING MATERIAL Patent

Harold E. Sliney, inventer (to NASA) Issued 29 Jul. 1980 7 p Filed 31 Jan. 1977 Supersedes N77-32249 (15 - 23, p 3050) Division of abandoned US Patent Appl. SN-616528, filed 25 Sep. 1975, which is a division of US Patent Appl. SN-513611, filed 10 Oct. 1974

(NASA-Case-LEW-11930-3; US-Patent-4,214,905; US-Patent-Appl-SN-764245; US-Patent-Class-75-200; US-Patent-Class-75-222; US-Patent-Appl-SN-616528; US-Patent-Appl-SN-513611) Avail: US Patent and Trademark Office CSCL 11D

A composite material is described which will provide low friction surfaces for materials in rolling or sliding contact and is self lubricating and oxidation resistant up to and in excess of about 930 C. The composite is comprised of a metal component which lends strength and elasticity to the structure, a fluoride salt component which provides lubrication and, lastly, a glass component which not only provides oxidation protection to the metal but may also enhance the lubrication qualities of the composite.

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

25 INORGANIC AND PHYSICAL CHEMISTRY

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

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

N80-23383* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

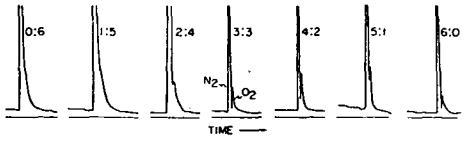
CHELATE-MODIFIED POLYMERS FOR ATMOSPHERIC GAS CHROMATOGRAPHY Patent

Warren W. Christensen (San Jose State Univ.), Ludwig A. Mayer (San Jose State Univ.), and Fritz H. Woeller, inventors (to NASA) (San Jose State Univ.) Issued 22 Apr. 1980 9 p Filed 30 Jun. 1978 Supersedes N78-27275 (16 - 18, p 2375) Sponsored by NASA

(NASA-Case-ARC-11154-1; US-Patent-4,198,792; US-Patent-Appl-SN-921626; US-Patent-Class-521-55; US-Patent-Class-55-66; US-Patent-Class-55-67; US-Patent-Class-55-68; US-Patent-Class-55-72; US-Patent-Class-521-146; US-Patent-Class-521-918; US-Patent-Class-525-4) Avail: US Patent and Trademark Office CSCL 07D

Chromatographic materials were developed to serve as the stationary phase of columns used in the separation of atmospheric gases. These materials consist of a crosslinked porous polymer matrix, e.g., a divinylbenzene polymer, into which has been embedded an inorganic complexed ion such as N,N'-ethylene-bis-(acetylacetoniminato)-cobalt (2). Organic nitrogenous bases, such as pyridine, may be incorporated into the chelate polymer complexes to increase their chromatographic utility. With such materials, the process of gas chromatography is greatly simplified, especially in terms of time and quantity of material needed for a gas separation.

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



N80-23394*# National Aeronautics and Space Administration. Pasadena Office, Calif.

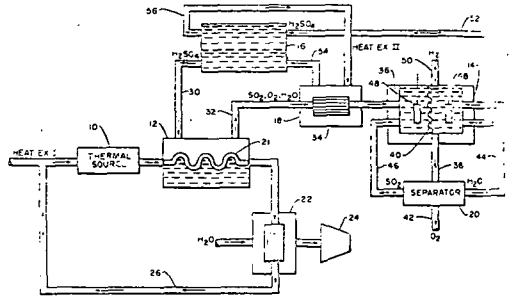
POTENTIAL HEAT EXCHANGE FLUIDS FOR USE IN SULFURIC ACID VAPORIZERS Patent Application

D. D. Lawson (JPL) and G. R. Petersen, inventors (to NASA) (JPL) Filed 30 Apr. 1980 17 p

(Contract NAS7-100)

(NASA-Case-NPO-15015-1; US-Patent-Appl-SN-145207) Avail: NTIS HC A02/MF A01 CSCL 07A

The testing of several candidate perfluorocarbon liquids for the direct fluid contact heat exchange with H2SO4 at about 330 C prior to high temperature decomposition in the oxygen release step of several thermochemical cycles for splitting water into hydrogen and oxygen is described. Among the several liquids tested, only perfluoropropylene oxide polymers having a degree of polymerization from about 10 to 60 were chemically stable and had low miscibility and vapor pressure when tested with sulfuric acid at temperatures from 300 C to 400 C. The thermochemical cycle is outlined. NASA

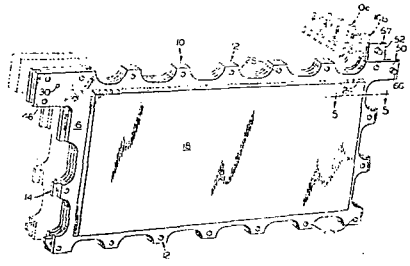


N80-26406*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

CELL AND METHOD FOR ELECTROLYSIS OF WATER AND ANODE THEREFOR Patent Application

John R. Aylward, inventor (to NASA) (Hamilton Standard, Windsor Locks, Conn.) Filed 20 Jun. 1980 20 p Sponsored by NASA (NASA-Case-MSC-16394-1; US-Patent-Appl-SN-161255) Avail: NTIS HC A02/MF A01 CSCL 07D

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



N80-26407*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PREPARATION OF PERFLUORINATED 1,2,4-OXADIAZOLES Patent Application

Reinhold H. Kratzer (Ultrasystems, Inc., Irvine, Calif.), Kaximiera J. L. Paciorek (Ultrasystems, Inc., Irvine, Calif.), Thomas I. Ito (Ultrasystems, Inc., Irvine, Calif.), and Robert W. Rosser, inventors (to NASA) Filed 27 Jun. 1980 9 p

(NASA-Case-ARC-11267-2; US-Patent-Appl-SN-163838) Avail: NTIS HC A02/MF A01 CSCL 07D

A method of preparing fluorinated alkyl or alkylether 1,2,4-oxadiazoles is disclosed. The oxadiazoles are synthesized by cyclizing the corresponding alkyl or alkylether imidoylamidoximes in vacuo or in an inert atmosphere at a temperature within the range of 40 to 100 C for a period of 8 to 144 hours in the presence of an acid compound which can accept ammonia to form a salt. The imidoylamidoximes usable in this process may be either polymeric or nonpolymeric. As a result of the low cyclization temperatures, the quality and quantity of the 1,2,4-oxadiazole polymers are better than other disclosed processes. NASA

N80-31490*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SYNTHESIS OF DAWSONITES Patent Application

Robert L. Altman, inventor (to NASA) Filed 14 Aug. 1980 10 p

(NASA-Case-ARC-113261-1; US-Patent-Appl-SN-178192) Avail: NTIS HC A02/MF A01 CSCL 07A

Alkali metal and ammonium dawsonites are prepared by a nonaqueous process where equimolar quantities of the corresponding hydrogen carbonate and aluminum hydroxide in finely divided state are heated together to a temperature within the range of 150 to 250 C for a period of 1 to 6 hours under a carbon dioxide pressure within the range of 120 to 360 psig. Carbonates may be used instead of hydrogencarbonates. A type of dawsonite is provied that can be used in extinguishing fires caused by hot surface ignition of hydrocarbon fuels. NASA

---

26 METALLIC MATERIALS

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

N80-23419* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

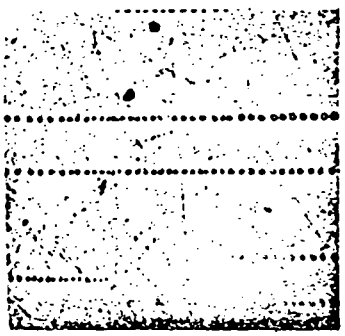
PREPARATION OF MONOTECTIC ALLOYS HAVING A CONTROLLED MICROSTRUCTURE BY DIRECTIONAL SOLIDIFICATION UNDER DOPANT-INDUCED INTERFACE BREAKDOWN Patent

Richard A. Parr, Mary H. Johnston, and John C. McClure, inventors (to NASA) Issued 15 Apr. 1980 8 p Filed 29 Dec. 1978 Supersedes N79-16943 (17 - 08, p 0953)

(NASA-Case-MFS-23816-1; US-Patent-4,198,232; US-Patent-Appl-SN-974292; US-Patent-Class-75-135; US-Patent-Class-75-138; US-Patent-Class-75-178R; US-Patent-Class-148-32) Avail: US Patent and Trademark Office CSCL 11F

Monotectic alloys having aligned spherical particles of rods of the minor component dispersed in a matrix of the major component are prepared by forming a melt containing predetermined amounts of the major and minor components of a chosen monotectic system, providing in the melt a dopant capable of breaking down the liquid solid interface for the chosen alloy, and directionally solidfying the melt at a selected temperature gradient and a selected rate of movement of the liquid-solid interface (growth rate). Shaping of the minor component into spheres or rods and the spacing between them are controlled by the amount of dopant and the temperature gradient and growth rate values. Specific alloy systems include Al Bi, Al Pb and Zn Bi, using a transition element such as iron.

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



N80-28492* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

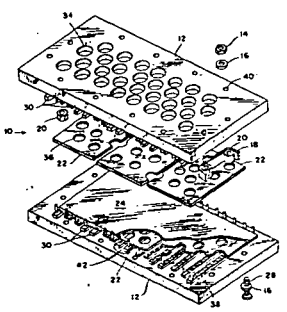
HEAT TREAT FIXTURE AND METHOD OF HEAT TREATING Patent

Charles S. Beuyukian (Rockwell International Corp., Downey, Calif.), Robert M. Heisman (Rockwell International Corp., Downey, Calif.), Cyrus C. Haynie (Rockwell International Corp., Downey, Calif.), and Emil P. Ruppe, inventors (to NASA) (Rockwell International Corp., Downey, Calif.) Issued 15 Jul. 1980 4 p Filed 23 Mar. 1979 Supersedes N79-25197 (17 - 16, p 2104) Sponsored by NASA

(NASA-Case-LAR-11821-1; US-Patent-4,212,690; US-Patent-Appl-SN-023501; US-Patent-Class-148-131; US-Patent-Class-266-119; US-Patent-Class-266-249; US-Patent-Class-266-274) Avail: US Patent and Trademark Office CSCL 11F

A heat treating fixture is disclosed in which the shape of the metal specimen is maintained by cold rolled steel support plates. Glide sheets of stainless steel, coated with boron nitride, in contact with each face of the metal specimens, allow for lateral expansion of the metal specimens without binding. Grooved support bars separate the glide sheets from the upper and lower support plates and allow flow of quenching fluid to the metal specimen.

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



N80-32484* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

HIGH TOUGHNESS-HIGH STRENGTH IRON ALLOY Patent

Joseph R. Stephens and Walter R. Witzke, inventors (to NASA) Issued 29 Jul. 1980 4 p Filed 25 Jan. 1979 Supersedes N79-19145 (17 - 10, p 1255) Continuation-in-part of abandoned US Patent Appl. SN-803822, filed 6 Jun. 1977

(NASA-Case-LEW-12542-3; US-Patent-4,214,902; US-Patent-Appl-SN-007083; US-Patent-Class-75-124; US-Patent-Appl-SN-803822) Avail: US Patent and Trademark Office CSCL 11F

An iron alloy is provided which exhibits strength and toughness characteristics at cryogenic temperatures. The alloy consists essentially of about 10 to 16 percent by weight nickel, about 0.1 to 1.0 percent by weight aluminum, and 0 to about 3 percent by weight copper, with the balance being essentially iron. The iron alloy is produced by a process which includes cold rolling at room temperature and subsequent heat treatment. Official Gazette of the U.S. Patent and Trademark Office

27 NONMETALLIC MATERIALS

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

N80-23452* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

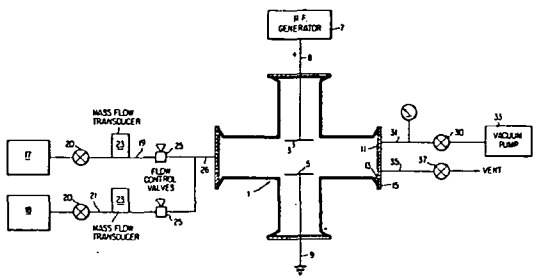
REVERSE OSMOSIS MEMBRANE OF HIGH UREA REJECTION PROPERTIES Patent

Catherine C. Johnson and Theodore J. Wydeven, inventors (to NASA) Issued 22 Apr. 1980 6 p Filed 9 Jun. 1976 Supersedes N77-18265 (15 - 09, p1152)

(NASA-Case-ARC-10980-1; US-Patent-4,199,448; US-Patent-Appl-SN-694407; US-Patent-Class-210-23H; US-Patent-Class-204-171; US-Patent-Class-210-500M; US-Patent-Class-427-41; US-Patent-Class-427-245) Avail: US Patent and Trademark Office CSCL 11G

Polymeric membranes suitable for use in reverse osmosis water purification because of their high urea and salt rejection properties are prepared by generating a plasma of an unsaturated hydrocarbon monomer and nitrogen gas from an electrical source. A polymeric membrane is formed by depositing a polymer of the unsaturated monomer from the plasma onto a substrate, so that nitrogen from the nitrogen gas is incorporated within the polymer in a chemically combined form.

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



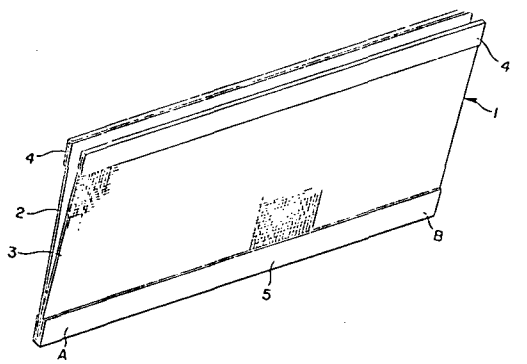
N80-23454*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ADJUSTABLE HIGH EMITTANCE GAP FILLER Patent Application

Howard E. Goldstein, Carlos Estrella, Marnell Smith, David A. Stewart, and Daniel B. Leiser (Stanford Univ.) Filed 7 May 1980 17 p

(NASA-Case-ARC-11310-1; US-Patent-Appl-SN-147700) Avail: NTIS HC A02/MF A01 CSCL 11G

A flexible, adjustable refractory filler is disclosed for filling gaps between ceramic tiles forming the heat shield of a space shuttle vehicle, to protect its aluminum skin during atmospheric re-entry. The easily installed and replaced filler consists essentially of a strip of ceramic cloth coated, at least along both its longitudinal edges with a room temperature vulcanizable silicone rubber compound with a high emittance colored pigment. The filler may have one or more layers as the gap width requires. Preferred materials are basket-weave aluminoborosilicate cloth, and a rubber compounded with silicon tetraboride as the emittance agent and finely divided borosilicate glass containing about 7.5% B203 as highly temperature binder. The filler cloth strip or tape is cut to proper width and length, inserted into the gap, and fastened with previously applied drops of silicone rubber adhesive. NASA



N80-24437* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

MODIFICATION OF THE ELECTRICAL AND OPTICAL PROPERTIES OF POLYMERS Patent

Michael J. Mirtich and James S. Sovey, inventors (to NASA) Issued 22 Apr. 1980 4 p Filed 7 Nov. 1978 Supersedes N70-11216 (17 - 02, p 0164)

(NASA-Case-LEW-13027-1; US-Patent-4,199,650; US-Patent-Appl-SN-958575; US-Patent-Class-428-421; US-Patent-Class-427-38; US-Patent-Class-427-40; US-Patent-Class-427-164; US-Patent-Class-428-474) Avail: US Patent and Trademark Office CSCL 11G

An electron bombardment argon ion source is used to form textured surfaces on polymide and fluorinated ethylene propylene polymers. This treatment improves the optical and electrical properties so that these polymers may be used in industrial and space applications.

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

N80-24438* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

HEAT RESISTANT POLYMERS OF OXIDIZED STYRYLPHOSPHINE Patent

Kazimiera J. L. Paciorek, inventor (to NASA) (Ultrasystems, Inc., Irvine, Calif.) Issued 29 Apr. 1980 14 p Filed 19 May 1978 Supersedes N7825217 (16 - 16 p 2094) Division of US Patent Appl. SN-706424, filed 19 Jul. 1976, US Patent 4, 092, 466 Sponsored by NASA

(NASA-Case-MSC-14903-3; US-Patent-4,200,721; US-Patent-Appl-SN-907479; US-Patent-Class-526-261; US-Patent-Class-525-326; US-Patent-Class-525-336; US-Patent-Class-525-340; US-Patent-Class-525-374; US-Patent-Class-525-375; US-Patent-Class-526-275; US-Patent-Class-526-276; US-Patent-Class-526-278; US-Patent-Class-260-DIG.29; US-Patent-Class-528-481; US-Patent-Appl-SN-706424) Avail: US Patent and Trademark Office CSCL 07C

A flame resistant, nontoxic polymer which may be used safely in confined locations where there is inadequate ventilation

is prepared either by polymerizing compounds having the formula R-N=P(C6H5)2(C6H4)CH=CH2 where R is an organic moeity selected from the group of (C6H5)2P(O)-, (C6H5O)2P(O)-, (C6H5)2 C3N3-, or their mixtures, or by reacting a polymer with an organic azide such as diphenylphosphinylazide, diphenylphosphorylazide, 2-azido-4,6-diphenly-5-triazine, 2,4-diazido-6-phenyl-s-triazine, trimethylsilyoazide, triphenylsilylazine, and phenylazine. The reaction of the styrylphosphine with the organozaide results in the oxidation of the trivalent phosphorus atom to the pentavalent state in the form of an unsaturated P=N linkage known as a phosphazene group.

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

N80-24440*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

HEAT SEALABLE, FLAME AND ABRASION RESISTANT COATED FABRIC Patent Application

Richard P. Tschirch (Little (Arthur D.), Inc., Cambridge, Mass.) and Kenneth R. Sioman, inventors (to NASA) (Little (Arthur D.), Inc., Cambridge, Mass.) Filed 30 Apr. 1980 17 p
(Contract NAS9-13979)
(NASA-Case-MSC-18382-1; US-Patent-Appl-SN-145107) Avail: NTIS HC A02/MF A01 CSCL 11E

A flexible, lightweight air impermeable coated fabric was developed to replace the flame retardant neoprene coated nylon fabric used as the micrometeorite protection layer in the intravehicular thermomicrometeorite garment. The elastometric compositions are comprised of thermoplastic polyurethane polymer and flame retarding amounts of a filler selected from decabromodiphenlyoxide and antimony oxide in a 3:1 weight ratio, and decabromodiphenyloxide, antimony oxide, and ammonium polyphosphate in as 3:1:3 weight ratio. The compounds were dissolved at about 40% solids in tetrahydrofuran. Films cast from the solution were dried and bonded to the fabric under heat and pressure at 400 F, 30 psi with 10 sec dwell time. Either heat or dielectric sealing procedures can be used.

NASA

N80-26446* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

VITRA-VIOLET PROCESS FOR PRODUCING FLAME RESISTANT POLYAMIDES AND PRODUCTS PRODUCED THEREBY Patent

Madeline S. Toy (Sci. Appl., Inc., La Jolla, Calif.) and Roger S. Stringham, inventors (to NASA) (Sci. Appl., Inc., La Jolla, Calif.) Issued 20 May 1980 4 p Filed 6 Dec. 1976 Supersedes N77-14262 (15 - 05, p 0594) Sponsored by NASA
(NASA-Case-MSC-16074-1; US-Patent-4,203,723; US-Patent-Appl-SN-747674; US-Patent-Class-8-115.5; US-Patent-Class-8DIG.12; US-Patent-Class-8DIG.18; US-Patent-Class-204-159.15; US-Patent-Class-204-159.19; US-Patent-Class-525-426) Avail: US Patent and Trademark Office CSCL 07C

Aromatic polyamides with improved nonflammability characteristics are produced by contacting a polyamide substrate with a gaseous medium comprising a minor amount of a haloolefinic material and an inert diluent in the presence of light having sufficient energy to effect chemical addition of the haloolefin to the polyamide substrate.

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

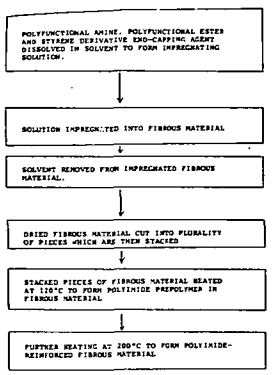
N80-26447*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

LOW TEMPERATURE CROSS LINKING POLYIMIDES Patent Application

Tito T. Serafini and Peter Delviss, inventors (to NASA) Filed 20 Jun. 1980 14 p
(NASA-Case-LEW-12876-1; US-Patent-Appl-SN-161253) Avail: NTIS HC A02/MF A01 CSCL 07C

A way of forming a prepolymer polyimide which can be cross-linked at a relatively low temperature is disclosed. Usually a polyimide is formed by cross linking a prepolymer formed by reacting a polyfunctional ester, a polyfunctional amine, and an end-capping unit. By providing a styrene derivative end-capping unit, the prepolymer is curable at a temperature of about 175 to 245 C.

NASA



N80-29496*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

CASTABLE HIGH TEMPERATURE REFRACTORY MATERIALS Patent Application

I. Zaplatynsky, inventor (to NASA) Filed 30 Jul. 1980 5 p
(NASA-Case-LEW-13080-1; US-Patent-Appl-SN-173521) Avail: NTIS HC A02/MF A01 CSCL 07D

A method is disclosed for fabricating chemically inert ceramic bodies that are both highly refractory and porous. A paste is formed by mixing alumina grain having uniform particle size with colloidal silica that is stabilized with ammonia. After drying, the cast body has sufficient green strength to be handled, and it is transferred to a furnace for curing. A green body prepared in this fashion does not undergo shrinkage during curing nor during prolonged subsequent heating.

NASA

N80-31551*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PHOSPHORUS-CONTAINING BISIMIDE RESINS Patent Application

Indra K. Varma (National Academy of Science - National Research Council, Washington, D.C.), George M. Fohlen, and John A. Parker, inventors (to NASA) Filed 5 Aug. 1980 12 p
(NASA-Case-ARC-11321-1; US-Patent-Appl-SN-175452) Avail: NTIS HC A02/MF A01 CSCL 07C

Fire resistant resins particularly useful for making laminates with inorganic fibers such as graphite fibers are made by condensation of an ethylenically unsaturated cyclic anhydride with bis (diaminophenyl) phosphine oxide, and by addition polymerization of the bisimide so obtained. Up to about 50%, on a molar basis, of benzophenonetetracarboxylic acid anhydride can be substituted for some of the cyclic anhydride to alter the properties of the products. Graphite cloth laminates made with these resins have shown 800 C char yields greater than 70% by weight in nitrogen. Limiting oxygen indexes of more than 10% were determined for these resins.

NASA

N80-32514* National Aeronautics and Space Administration. Pasadena Office, Calif.

CURABLE LIQUID HYDROCARBON PREPOLYMERS CONTAINING HYDROXYL GROUPS AND PROCESS FOR PRODUCING SAME Patent

Robert A. Rhein (JPL) and John D. Ingham, inventors (to NASA) (JPL) Issued 3 Oct. 1980 6 p Filed 28 Jun. 1973 Continuation-in-part of abandoned US Patent Appl. SN-332123, filed 13 Feb. 1973 Sponsored by NASA

(NASA-Case-NPO-13137-1; US-Patent-4,118,427; US-Patent-Appl-SN-374810; US-Patent-Appl-SN-332123; US-Patent-Class-568-852; US-Patent-Class-568-861) Avail: US Patent and Trademark Office CSCL 07A

Production of hydroxyl containing curable liquid hydrocarbon prepolymers by ozonizing a high molecular weight saturated hydrocarbon polymer such as polyisobutylene or ethylene propylene rubber is discussed. The ozonized material is reduced using reducing agents, preferably diisobutyl aluminum hydride, to form the hydroxyl containing liquid prepolymers having a substantially lower molecular weight than the parent polymer. The resulting curable liquid hydroxyl containing prepolymers can be poured into a mold and readily cured, with reactants such as toluene diisocyanate, to produce highly stable elastomers having a variety of uses such as binders for solid propellants.

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

N80-32515* National Aeronautics and Space Administration. Pasadena Office, Calif.

PREPOLYMER DIANHYDRIDES Patent

Robert A. Rhein (JPL) and John D. Ingham, inventors (to NASA) (JPL) Issued 1 Apr. 1980 6 p Filed 14 Aug. 1978 Continuation of abandoned US Patent Appl. SN-761252, filed 21 Jan. 1977 Sponsored by NASA

(NASA-Case-NPO-13899-1; US-Patent-4,196,129; US-Patent-Appl-SN-933186; US-Patent-Class-260-346.3; US-Patent-Appl-SN-761252) Avail: US Patent and Trademark Office CSCL 07A

A process for preparing dianhydrides that are miscible with hydroxyl prepolymers at moderate temperatures and can cure hydroxyl prepolymers to elastomers at moderate temperatures is disclosed. The dianhydrides are prepared by solution reaction of a prepolymer diol with excess hydride followed by removal of unreacted dianhydride. The prepolymer dianhydrides are miscible with hydroxyl substituted hydrocarbon prepolymers and cure the prepolymers to polyester-linked elastomers.

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

N80-32516* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

METHOD OF CROSS-LINKING POLYVINYL ALCOHOL AND OTHER WATER SOLUBLE RESINS Patent

Warren H. Phillipp, Charles E. May, Li-Chen Hsu, and Dean W. Sheibley, inventors (to NASA) Issued 19 Aug. 1980 4 p Filed 20 Dec. 1978 Supersedes N79-14172 (17 - 05, p 0571)

(NASA-Case-LEW-13103-1; US-Patent-4,218,280; US-Patent-Appl-SN-971596; US-Patent-Class-156-272; US-Patent-Class-156-292; US-Patent-Class-264-22; US-Patent-Class-264-212; US-Patent-Class-204-159.11; US-Patent-Class-204-159.14; US-Patent-Class-427-44; US-Patent-Class-428-500; US-Patent-Class-429-139) Avail: US Patent and Trademark Office CSCL 07C

A self supporting sheet structure comprising a water soluble, noncrosslinked polymer such as polyvinyl alcohol which is capable of being crosslinked by reaction with hydrogen atom radicals and hydroxyl molecule radicals is contacted with an aqueous solution having a pH of less than 8 and containing a dissolved salt in an amount sufficient to prevent substantial dissolution of the noncrosslinked polymer in the aqueous solution. The aqueous solution is then irradiated with ionizing radiation to form hydrogen atom radicals and hydroxyl molecule radicals and the irradiation is continued for a time sufficient to effect crosslinking of the water soluble polymer to produce a water insoluble polymer sheet structure. The method has particular application in the production of battery separators and electrode envelopes for alkaline batteries.

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

---

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.*

N80-23471* National Aeronautics and Space Administration. Pasadena Office, Calif.

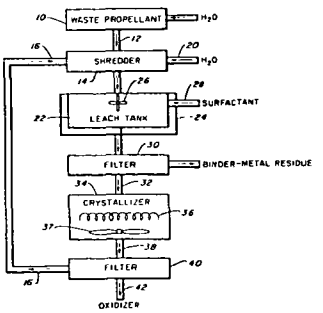
PROCESS FOR THE LEACHING OF AP FROM PROPELLANT Patent

Graham C. Shaw (Thiokol Corp., Brigham City, Utah) and Meldon J. McIntosh, inventors (to NASA) (Thiokol Corp., Brigham City, Utah) Issued 15 Apr. 1980 7 p Filed 29 Sep. 1978 Supersedes N79-10227 (17 - 01, p 0031) Sponsored by NASA

(NASA-Case-NPO-14109-1; US-Patent-4,198,209; US-Patent-Appl-SN-946990; US-Patent-Class-23-302R; US-Patent-Class-149-108.4; US-Patent-Class-23-302T; US-Patent-Class-23-300; US-Patent-Class-23-302A) Avail: US Patent and Trademark Office CSCL 21I

A method for the recovery of ammonium perchlorate from waste solid rocket propellant is described wherein shredded particles of the propellant are leached with an aqueous leach solution containing a low concentration of surface active agent while stirring the suspension.

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



N80-26460*# National Aeronautics and Space Administration. Pasadena Office, Calif.

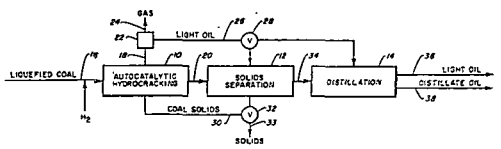
AUTOCATALYTIC COAL LIQUEFACTION PROCESS Patent Application

Shaik A. Qader, inventor (to NASA) (JPL) Filed 28 Jan. 1980 31 p Sponsored by NASA

(NASA-Case-NPO-14876-1; US-Patent-Appl-SN-116310) Avail: NTIS HC A03/MF A01 CSCL 21D

An improved process is disclosed for liquefying coal in which coal minerals at high content are utilized as a hydrocracking catalyst. A slurry of 10 to 60% by weight of coal in recycled liquefied coal product which contains 15% to 30% by weight of

coal minerals, is pressurized with excess hydrogen to a pressure of 2,000 to 4,000 psi and heated to a temperature of 450 to 550 C. The coal minerals autocatalytically convert coal solids to a low viscosity liquid product and to gas product in high yields while reducing oxygen, nitrogen and sulfur content of the coal product as compared to other coal liquefaction processes under development. NASA



N80-28536* National Aeronautics and Space Administration. Pasadena Office, Calif.

SILICONE CONTAINING SOLID PROPELLANT Patent

Kumar N. R. Ramohalli, inventor (to NASA) (JPL) Issued 1 Jul. 1980 4 p Filed 16 Oct. 1978 Supersedes N79-10224 (17 - 01, p 0030)

(NASA-Case-NPO-14477-1; US-Patent-4,210,474; US-Patent-Appl-SN-951830; US-Patent-Class-149-19.2; US-Patent-Class-149-19.9; US-Patent-Class-149-20) Avail: US Patent and Trademark Office CSCL 21I

The addition of a small amount, for example 1% by weight, of a liquid silicone oil to a metal containing solid rocket propellant provides a significant reduction in heat transfer to the inert nozzle walls. Metal oxide slag collection and blockage of the nozzle are eliminated and the burning rate is increased by about 5% to 10% thus improving ballistic performance.

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

31 ENGINEERING (GENERAL)

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

N80-32583* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

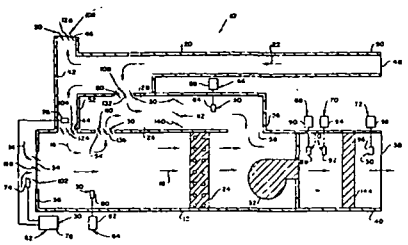
APPARATUS FOR SUPPLYING CONDITIONED AIR AT A SUBSTANTIALLY CONSTANT TEMPERATURE AND HUMIDITY Patent

Henry D. Obler, inventor (to NASA) Issued 1 Jul. 1980 9 p Filed 6 Feb. 1979 Supersedes N79-19688 (17 - 10, p 1331

(NASA-Case-GSC-12191-1; US-Patent-4,210,278; US-Patent-Appl-SN-009886; US-Patent-Class-236-49; US-Patent-Class-236-13; US-Patent-Class-236-44C; US-Patent-Class-165-16) Avail: US Patent and Trademark Office CSCL 13B

The apparatus includes a supply duct coupled to a source of supply air for carrying the supply air therethrough. A return duct is coupled to the supply duct for carrying return conditioned air therethrough. A temperature reducing device is coupled to the supply duct for decreasing the temperature of the supply and return conditioned air. A by-pass duct is coupled to the supply duct for selectively directing portions of the supply and return conditioned air around the temperature reducing device. Another by-pass duct is coupled to the return duct for selectively directing portions of the return conditioned air around the supply duct and the temperature reduction device. Controller devices selectively control the flow and amount of mixing of the supply and return conditioned air.

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



N80-32584* National Aeronautics and Space Administration. Pasadena Office, Calif.

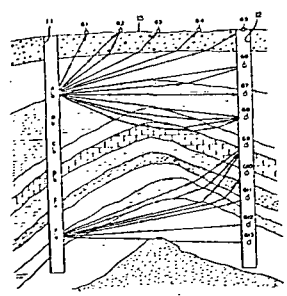
SYSTEM FOR PLOTTING SUBSOIL STRUCTURE AND METHOD THEREFOR Patent

Keshavaiyengar Y. Narasimhan (JPL), Robert Nathan (JPL), and Shakkottai P. Parthasarathy, inventors (to NASA) (JPL) Issued 22 Jul. 1980 8 p Filed 6 Sep. 1977 Supersedes N79-20555 (17 - 11, p 1455) Sponsored by NASA

(NASA-Case-NPO-14191-1; US-Patent-4,214,226; US-Patent-Appl-SN-830846; US-Patent-Class-367-27; US-Patent-Class-181-102; US-Patent-Class-367-36; US-Patent-Class-367-57) Avail: US Patent and Trademark Office CSCL 08M

Data for use in producing a tomograph of subsoil structure between boreholes is derived by pacing spaced geophones in one borehole, on the Earth surface if desired, and by producing a sequence of shots at spaced apart locations in the other borehole. The signals, detected by each of the geophones from the various shots, are processed either on a time of arrival basis, or on the basis of signal amplitude, to provide information of the characteristics of a large number of incremental areas between the boreholes. Such information is useable to produce a tomograph of the subsoil structure between the boreholes. By processing signals of relatively high frequencies, e.g., up to 100 Hz, and by closely spacing the geophones, a high resolution tomograph can be produced.

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



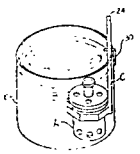
N80-32585*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

LIQUID IMMERSION APPARATUS FOR MINUTE ARTICLES Patent Application

Jewell G. Belcher and Ben R. Hollis, inventors (to NASA) Filed 18 Jul. 1980 9 p

(NASA-Case-MFS-25363-1; US-Patent-Appl-SN-171933) Avail: NTIS HC A02/MF A01 CSCL 13H

An apparatus for immersing minute articles such as integrated circuit chip in an etching solution during manufacture of the chips is described. The apparatus includes a basket having minute fluid passages in its sides and bottom, the passages being dimensioned to overcome buoyancy while allowing complete circulation. The basket has a removable lid member also having fluid passages to prevent air pockets and facilitate circulation. Both the basket and lid member are constructed of corrosion resistant material such as Teflon and are dimensional to provide a friction bit. A holder member including handle portion and support mean is disposed to support and retain the basket while in the solution. The overall combination of the basket, lid, and handle having the features referred to above enable treatment of the chips and avoidance of losses and unnecessary handling.
E.D.K.



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.*

N80-23524* National Aeronautics and Space Administration. Pasadena Office, Calif.

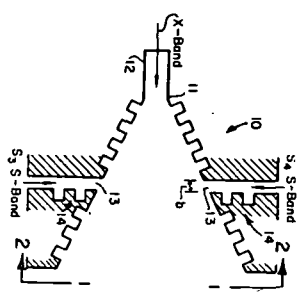
DUAL BAND COMBINER FOR HORN ANTENNA Patent

William F. Williams (JPL) and Seymour B. Cohn, inventors (to NASA) (JPL) Issued 22 Apr. 1980 5 p Filed 31 Jan. 1979 Supersedes N79-17068 (17 - 08, p 0968) Sponsored by NASA

(NASA-Case-NPO-14519-1; US-Patent-4,199,764; US-Patent-Appl-SN-008207; US-Patent-Class-343-786; US-Patent-Class-343-895) Avail: US Patent and Trademark Office CSCL 17B

A corrugated horn antenna, adapted to be coupled to a waveguide at its apex for X-band excitation is further adapted to be connected to waveguides through a circumferential slot for S-band excitation at four distinct phases selected for the desired S-band polarization. The circumferential slot is positioned along the axial length of the horn for good impedance matching and is provided with an X-band choke in the form of two concentric choke slots. For further improvement in impedance matching, the second (outer) choke slot is divided by plugs into four segments that coincide with waveguide ports for the four distinct phases of the S-band.

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



N80-24510* National Aeronautics and Space Administration. Pasadena Office, Calif.

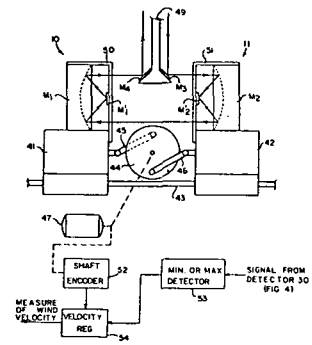
METHOD AND APPARATUS FOR DOPPLER FREQUENCY MODULATION OF RADIATION Patent

Jack S. Margolis (JPL), Daniel J. McCleese (JPL), Michael S. Shumate (JPL), and Clay H. Seaman, inventors (to NASA) (JPL) Issued 6 May 1980 6 p Filed 3 Nov. 1978 Supersedes N80-21141 (18 - 11 p 1493) Sponsored by NASA

(NASA-Case-NPO-14524-1; NASA-Case-NPO-14527-1; US-Patent-4,201,468; US-Patent-Appl-SN-957452; US-Patent-Class-356-28.5; US-Patent-Class-350-6.5; US-Patent-Class-350-6.6; US-Patent-Class-350-294) Avail: US Patent and Trademark Office CSCL 20N

A method and apparatus are described for frequency modulating radiation, such as from a laser, for optoacoustic detectors, interferometers, heterodyne spectrometers, and similar devices. Two oppositely reciprocating cats-eye retroreflectors are used to Doppler modulate the radiation. By reciprocally moving both retroreflectors, the center of mass is maintained constant to permit smooth operation at many Hertz. By slightly offsetting the axis of one retroreflector relative to the other, multiple passes of a light beam may be achieved for greater Doppler shifts with the same reciprocating motion of the retroreflectors.

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



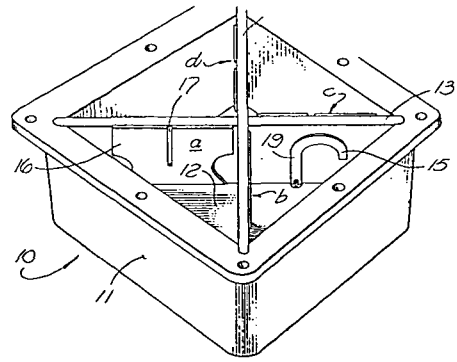
N80-24511*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

CAVITY-BACKED, MICRO-STRIP DIPOLE ANTENNA ARRAY Patent Application

Haynes Ellis, Jr., inventor (to NASA) (Rockwell Intern. Corp., Downey, Calif.) Filed 30 Apr. 1980 15 p (Contract NAS9-14000)

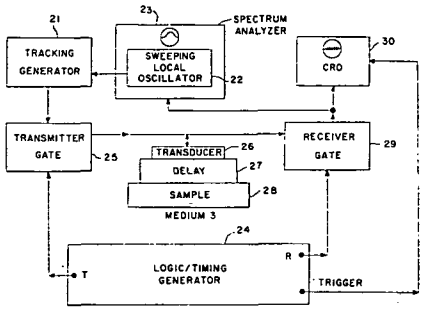
(NASA-Case-MSC-18606-1; US-Patent-Appl-SN-145206) Avail: NTIS HC A02/MF A01 CSCL 09E

A flush mounted, microwave band antenna for high performance aircraft and space vehicles is disclosed. Features of the cavity-backed microstrip antenna include: (1) low cost construction; (2) microstrip elements in orthogonal dipole arrangement; and (3) circular polarized sum and difference radiation patterns. The microstrip antenna elements are fed through quadrature hybrids proceeded by a comparator hybrid. J.M.S.



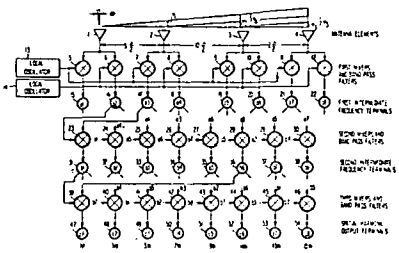
N80-26571*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
FREQUENCY TRACKED PULSE TECHNIQUE FOR ULTRASONIC ANALYSIS Patent Application
John H. Cantrell and Joseph S. Heyman, inventors (to NASA) Filed 10 Jun. 1980 21 p
(NASA-Case-LAR-12697-1; US-Patent-Appl-SN-158183) Avail: NTIS HC A02/MF A01 CSCL 20N

A tracking generator is slaved to a spectrum analyzer to produce an input signal having a frequency that follows the frequency of the spectrum analyzer sweeping local oscillator. The input signal is gated to a transducer by a transmitter gate to produce ultrasonic waves in the sample. The resulting ultrasonic echoes are converted into electrical signals by the transducer and then gated into the spectrum analyzer by receiver gate. This arrangement produces spectra that are equivalent to shock-exciting the transducer with a true delta function shock-excitation. NASA



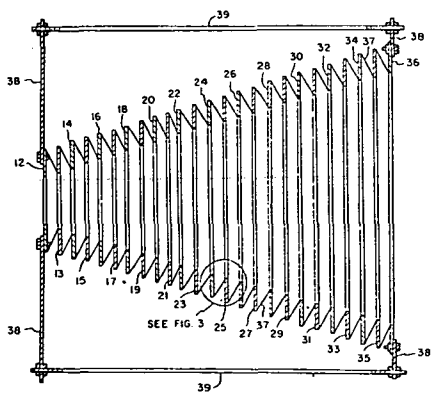
N80-28578* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SCANNABLE BEAM FORMING INTERFEROMETER ANTENNA ARRAY SYSTEM Patent
Julius A. Kaiser, Jr., inventor (to NASA) Issued 15 Jul. 1980 6 p Filed 14 May 1979 Supersedes N79-26252 (17 - 17, p 2249)
(NASA-Case-GSC-12365-1; US-Patent-4,213,131; US-Patent-Appl-SN-039031; US-Patent-Class-343-844; US-Patent-Class-343-100SA; US-Patent-Class-343-854) Avail: US Patent and Trademark Office CSCL 20N

An antenna array is described which comprises three interferometer pairs of antenna elements with selected spacings made to form a single beam which is readily scannable. All spatial frequencies generated by a signal and intercepted by the array are derived from a signal processing technique applied to the array. The array samples space in the spatial frequency domain while the signal processing technique utilizes real time convolution of functions in the spectral frequency domain. Summation of the appropriate spatial frequencies is equilvalent to a Fourier transform operation, yielding the location of the signal source in space. Resolution and freedom from interference of the interferometer system is equal to that of a fully filled array of the same aperture size containing element spacings of one half wavelength. An antenna array system comprising four antenna elements forming six interferometer pairs with a resolution equal to that of a sixteen element array with spacings of one half wavelength is described, as well as other multiples of one quarter wavelength of partial multiples of a wave length.
Official Gazette of the U.S. Patent and Trademark Office



N80-29539* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
COLLAPSIBLE CORRUGATED HORN ANTENNA Patent
Donald E. Barthlome, inventor (to NASA) Issued 9 May 1978 6 p Filed 20 May 1977 Supersedes N77-24339 (15 - 15, p 1976) Sponsored by NASA
(NASA-Case-LAR-11745-1; US-Patent-4,089,004; US-Patent-Appl-SN-799025; US-Patent-Class-343-786) Avail: US Patent and Trademark Office CSCL 09C

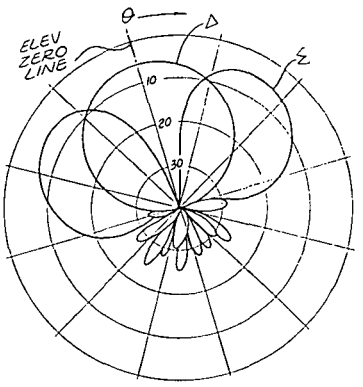
A horn antenna that is readily collapsible while not in use is described. A number of different sized annular metal rings are arranged in a sequence such that each ring is larger than the one that precedes it in the sequence. A number of thin flexible electrically conductive members attach successive metal rings together physically and connect them together electrically. Each flexible conductive member is attached to make electrical contact between the outside surface of a metal ring and the inside surface of an adjacent metal ring in the sequence.
Official Gazette of the U.S. Patent and Trademark Office



N80-29543*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
COMPLEMENTARY CROSS-SLOT PHASED ARRAY ANTENNA Patent Application
Haynes Ellis, Jr., inventor (to NASA) (Rockwell International Corp., Downey, Calif.) Filed 25 Jul. 1980 14 p Sponsored by NASA
(NASA-Case-MSC-18532-1; US-Patent-Appl-SN-172099) Avail: NTIS HC A02/MF A01 CSCL 09C

A flush mounting, cavity-backed, dual orthogonal slot antenna is described in which improved radiation pattern characteristics are obtained by making the spiral slot pattern elliptical in the

aperture plane. Coaxial split-tube baluns are used to drive the junctions between corresponding slot pairs. Optional cavity dielectric is provided and a drive coupling arrangement includes a four port compartor hybrid having sum and difference ports respectively, for alternate excitation to produce a single lobe or a double lobe pattern with null. Switching appratus is provided to connect a common terminal to either of the ports. NASA



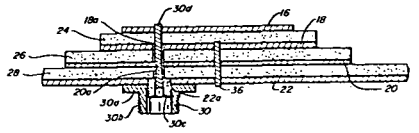
N80-32604* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

MULTIPLE BAND CIRCULARLY POLARIZED MICROSTRIP ANTENNA Patent

I-Ping Yu, inventor (to NASA) (Lockheed Electronics Co., Houston, Tex.) Issued 19 Aug. 1980 7 p Filed 22 Jun. 1979 Supersedes N79-27348 (17 - 18, p 2393 Sponsored by NASA
(NASA-Case-MSC-18334-1; US-Patent-4,218,682;
US-Patent-Appl-SN-051270; US-Patent-Class-343-700MS;
US-Patent-Class-343-830) Avail: US Patent and Trademark Office CSCL 09C

A multiple antenna assembly for communicating electromagnetic radiation is disclosed. An antenna element stack is constructed of a plurality of elliptical lamina antenna elements mutally separated by layers of dielectric material, and separated from a ground plane by dielectric material. The antenna assembly is coupled through a feed line in contact with the top antenna element. A conductor joins the remaining antenna elements to the ground plane. Each individual antenna element is operable for communication reception and transmission within a frequency band determined by the size of the particular antenna element. The sizes of the antenna elements may be selected to provide electromagnetic radiation communication over several distinct frequency bands, or to connect the individual bands into a broad band.

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



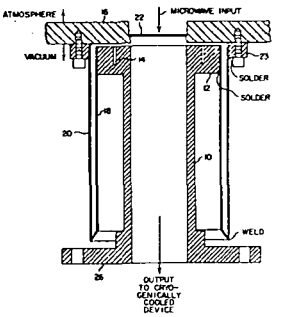
N80-32605* National Aeronautics and Space Administration. Pasadena Office, Calif.

SUPPORT ASSEMBLY FOR CRYOGENICALLY COOLABLE LOW-NOISE CHOKE WAVEGUIDE Patent

Frank E. McCrea, inventor (to NASA) (JPL) Issued 29 Jul. 1980 5 p Filed 31 Aug. 1978 Supersedes N79-10246 (17 - 01, p 0033) Sponsored by NASA
(NASA-Case-NPO-14253-1; NASA-Case-NPO-14640-1;
US-Patent-4,215,327; US-Patent-Appl-SN-938293;
US-Patent-Class-333-252; US-Patent-Class-333-12;
US-Patent-Class-333-99S) Avail: US Patent and Trademark Office CSCL 09C

A compact cryogenically coolable choked waveguide for low-noise input coupling into a cryogenically cooled device, such as a maser or parametric amplifier, utilizes coaxial stainless steel support tubes surrounding the waveguide and connected in cascade to provide a folded low thermal conduction path. The edges of the tubes connected are welded.

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

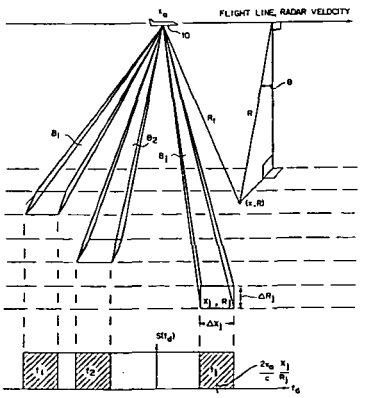


N80-32607*# National Aeronautics and Space Administration. Pasadena Office, Calif.

MULTIBEAM SINGLE FREQUENCY SYNTHETIC APERTURE RADAR PROCESSOR FOR IMAGING SEPARATE RANGE SWATHS Patent Application

Atul Jain, inventor (to NASA) (JPL) Filed 3 Jul. 1980 21 p (Contract NAS7-100)
(NASA-Case-NPO-14525-2; US-Patent-Appl-SN-165910) Avail: NTIS HC A02/MF A01 CSCL 20E

A single-frequency multibeam synthetic aperture radar for large swath imaging is disclosed. Each beam illuminates a separate 'footprint' (i.e., range and azimuth interval). The distinct azimuth intervals for the separate beams produce a distinct Doppler frequency spectrum for each beam. After range correlation of raw data, an optical processor develops image data for the different beams by spatially separating the beams to place each beam of different Doppler frequency spectrum in a different location in the frequency plane as well as the imaging plane of the optical processor. Selection of a beam for imaging is made in the frequency plane by adjusting the position of an aperture, or in the image plane by adjusting the position of a slit. The raw data is processed in digital form in an analogous manner. NASA



33 ELECTRONICS AND ELECTRICAL ENGINEERING

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

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

N80-23559* National Aeronautics and Space Administration. Pasadena Office, Calif.

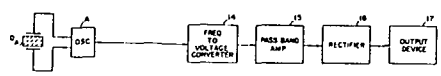
PASSIVE INTRUSION DETECTION SYSTEM Patent

Eric G. Laue, inventor (to NASA) (JPL) Issued 8 Apr. 1980 5 p Filed 9 Feb. 1977 Supersedes N77-19390 (15 - 10, p 1311) Sponsored by NASA

(NASA-Case-NPO-13804-1; US-Patent-4,197,530; US-Patent-Appl-SN-766999; US-Patent-Class-340-602; US-Patent-Class-310-319; US-Patent-Class-331-65; US-Patent-Class-340-604) Avail: US Patent and Trademark Office CSCL 09C

An intrusion detection system is described 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 at a frequency or rate which is within a known frequency band, due to the entry of an intruder into the protected volume. The variable frequency is converted into a voltage which is then filtered by a filtering arrangement which permits only voltage variations at frequencies within the known frequency band to activate an alarm, while inhibiting the alarm activation when the voltage frequency is below or above the known frequency band.

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



N80-24549*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

ELECTRICALLY CONDUCTIVE PALLADIUM CONTAINING POLYIMIDE FILMS Patent Application

Larry T. Taylor (Virginia Polytech. Inst. and State Univ.), Anne K. StClair (Virginia Polytech. Inst. and State Univ.), Vicki C. Carver (Virginia Polytech. Inst. and State Univ.), and Thomas A. Furtsch, inventors (to NASA) (Virginia Polytech. Inst. and State Univ.) Filed 28 Mar. 1980 16 p Sponsored by NASA

(NASA-Case-LAR-12705-1; US-Patent-Appl-SN-135058) Avail: NTIS HC A02/MF A01 CSCL 09A

A method is described for preparing lightweight, high temperature resistant, electrically conductive, palladium containing, polyimide films for use on aerodynamic and space applications. A palladium (2) ion-containing polymamic acid solution is prepared by reacting an aromatic dianhydride with an equimolar quantity of a palladium 2 ion-containing salt or complex. The reactant product is cast as a thin film onto a surface and cured at approximately 300 C to produce a flexible electrically conductive cyclic palladium containing polyimide. The source of palladium ions is selected from the gruop of palladium 2 compounds consisting of LiPdC14, Pd[S(CH3)2]2Cl2, Na2PdC14, and PdC14. NASA

N80-25538*# National Aeronautics and Space Administration. Pasadena Office, Calif.

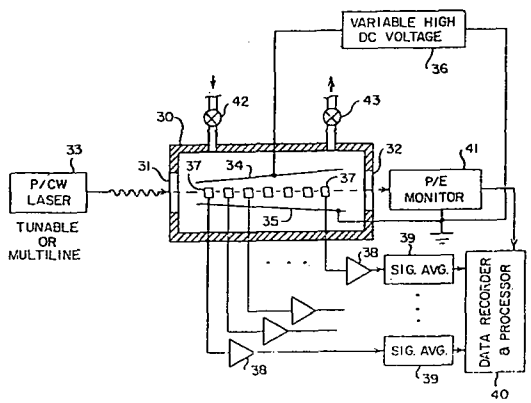
STARK EFFECT SPECTROPHONE FOR CONTINUOUS ABSORPTION SPECTRA MONITORING Patent Application

Michael J. Kavaya, inventors (to NASA) (JPL) Filed 30 May 1980 16 p

(Contract NAS7-100)

(NASA-Case-NPO-15102-1; US-Patent-Appl-SN-154726) Avail: NTIS HC A02/MF A01 CSCL 09A

A Stark effect spectrophone is provided with a pulsed or continuous wave laser for monitoring the constituents of an unknown gas. The laser beam is directed through windows of a closed cell while the unknown gas to be monitored is caused to flow continuously through the cell between electric field plates disposed in the cell on opposite sides of the beam path through the cell. The plates are so disposed as to be divergent, e.g., flat plates at an oblique angle relative to each other, or plates shaped according to a mathematical function, so that with constant voltage applied across the plates there is a variation in electric field strength along the beam path. Discrete energy absorption sensors are positioned at field strength points of interest. When a beam is passed through the cell, energy absorbed by the gas then present in the cell will increase gas pressure and temperature at each point along the beam path according to the spectral lines of the constituents of the gas for the particular field strengths at those points. This increase is sensed at each point simultaneously while modulating the absorption of the beams energy by the gas sample in the cell. NASA



N80-26599* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

PORTABLE DEVICE FOR USE IN STARTING AIR-START-UNITS FOR AIRCRAFT AND HAVING CABLE LEAD TESTING CAPABILITY Patent

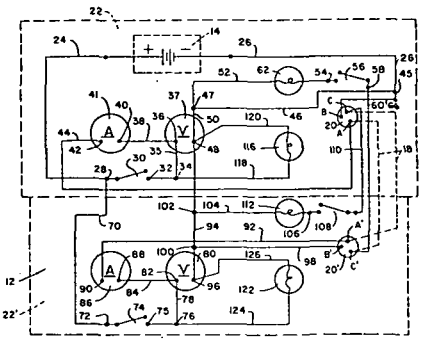
William R. Rosier (Serv-Air, Inc., Edwards, Calif.) and George G. Volk, inventors (to NASA) (Serv-Air, Inc., Edwards, Calif.) Issued 20 May 1980 7 p Filed 9 Mar. 1978 Supersedes N78-19166 (16 - 10, p 1263) Sponsored by NASA

(NASA-Case-FRC-10113-1; US-Patent-4,204,154; US-Patent-Appl-SN-885066; US-Patent-Class-324-51) Avail: US Patent and Trademark Office CSCL 09C

A portable device for starting aircraft engines and the like is disclosed. The device includes a lead testing and motor starting circuit characterized by: (1) a direct current voltage source, (2) a pair of terminal plugs connected with the circuit (each being characterized by a first, second, and third terminal) (3) a pair of manually operable switches for connecting the first terminal of each plug of the pair to the positive side of the voltage source, (4) a circuit lead connecting to the second terminal of each plug the negative side of said source, (5) a pair of electrical cables adapted to connect said first and second terminals of each plug to an air-start unit, and means for connecting each

cable of the pair of cables between the first terminal of one plug and the third terminal of the other plug of the pair, and (6) a second pair of manually operable switches for selectivity connecting the third terminal of each plug of the pair to the negative side of the voltage source.

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



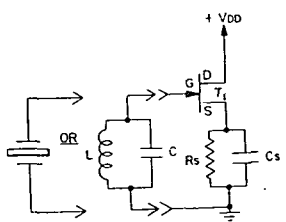
N80-26601*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

JFET OSCILLATOR Patent Application

Leonard L. Kleinberg, inventor (to NASA) Filed 27 May 1980 14 p

(NASA-Case-GSC-12555-1; US-Patent-Appl-SN-153240) Avail: NTIS HC A02/MF A01 CSCL 09A

A high frequency oscillator circuit is described. The circuit uses a low cost junction type field effect transistor (T sub 1) with a tuned circuit connected to its gate. The frequency of operation is determined by the tuned circuit and the capacitance reflected from the the source to the gate. The transistor is matched to the grequency of operation so that this frquency falls within the roll-off portion of the transistor's transconductance verses frequency curve, above the 3 db point in frequency. Phase shifting necessary to sustain oscillation occur to the operation of the transistor in the roll off portion of the curve and the addition of a phase shifting network (R sub 1 C) at the source. The resulting oscillator is small, stable, linear, and inexpensive. NASA



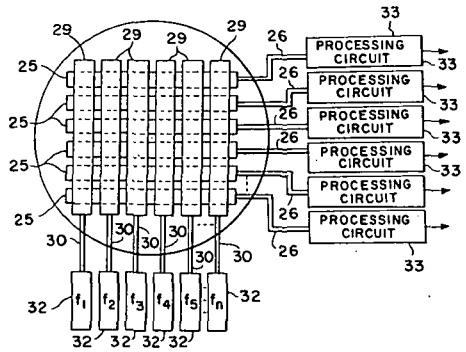
N80-28635*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PHOTOCAPACITIVE IMAGE CONVERTER Patent Application

William E. Miller, Arden Sher (Coll. of William and Mary, Williamsburg, Va.), and Yuan Huai Tsuo (Coll. of William and Mary, Williamsburg, Va.) 20 Jun. 1980 14 p

(NASA-Case-LAR-12513-1; US-Patent-Appl-SN-161256) Avail: NTIS HC A02/MF A01 CSCL 09A

Apparatus is described for converting a radiant energy image into corresponding electrical signals including an image converter. The image converter includes a substrate of semiconductor material, an insulating layer on the front surface of the substrate and an electrical contact on the back surface of the substrate. A series of parallel transparent conductive stripes is on the insulating layer with a processing circuit connected to each of the conductive stripes for detecting the modulated voltages generated. In a first embodiment of the invention, a modulated light stripe, perpendicular to the conductive stripes scans the image converter. The resulting modulated signals generated on the conductive stripes are detected by the processing circuits to produce signals that represent the image focused on the image converter. In a second embodiment of the invention a second insulating layer is deposited over the conductive stripes, and a second series of parallel transparent conductive stripes perpendicular to the first series is on the second insulating layer. A *different frequency current signal F sub n is applied to each of* the second series of conductive stripes, and a modulated image is applied to the image converter. The resulting signals detected by the processing circuits represent the image. NASA



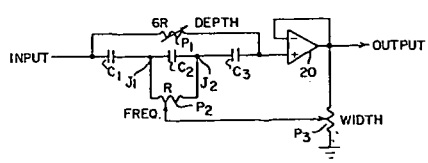
N80-29583*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

ACTIVE NOTCH FILTER NETWORK WITH VARIABLE NOTCH DEPTH, WIDTH AND FREQUENCY Patent Application

James M. Black, inventor (to NASA) Filed 25 Jul. 1980 13 p

(NASA-Case-FRC-11055-1; US-Patent-Appl-SN-172098) Avail: NTIS HC A02/MF A01 CSCL 09A

An active notch filter having independently adjustable notch frequency, width, and depth is provided by three equal capacitors connected in series with an operational amplifier (connected in a voltage follower configuration), a potentiometer across the series connected capacitors for notch depth adjustment, and a potentiometer (for notch frequency connected across the center capcitor); with its tap connected to receive a voltage feedback signal from a variable voltage divider comprised of another potentiometer for notch width. Adjusting the voltage dividing potentiometer will independently set the notch width, and adjusting the tap on the potentiometer across the center capacitor will independently adjust the notch frequency of the filter. A second operational amplifier connected in a voltage follower configuration may be used to connect the voltage divider output to the adjustable tap of the potentiometer across the center capacitor. NASA



N80-29584*# National Aeronautics and Space Administration. Pasadena Office, Calif.

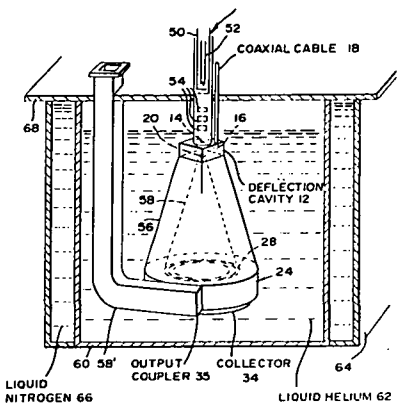
SUPERCONDUCTING GYROCON FOR HIGH POWER HIGH EFFICIENCY MICROWAVE GENERATOR/AMPLIFIER APPLICATION Patent Application

Huan-Chun Yen, inventor (to NASA) (JPL) Filed 18 Jul. 1980 17 p

(Contract NAS7-100)

(NASA-Case-NPO-14975-1; US-Patent-Appl-SN-171927) Avail: NTIS HC A02/MF A01 CSCL 09A

The superconducting gyrocon includes an electron gun, a deflection cavity, means for coupling RF energy into the deflection cavity, an output cavity, and an output coupler for removing energy from the output cavity. The inner surface of the deflection cavity and the inner surface of the output cavity or resonator is formed of a superconducting material such as Nb3Sn, lead, or niobium. The two cavities are submerged in liquid helium in order to maintain the superconducting material at a temperature of approximately 4 degrees Kelvin. Characteristics of the thus cooled superconducting material minimizes RF losses within the gyrocon, and allows the power gain of a conventional gyrocon to be increased from approximately 13 db to 54 db, and its efficiency from 82 percent to 92 percent. NASA



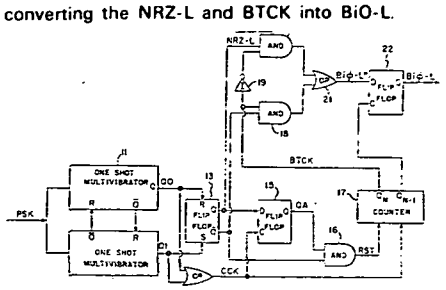
N80-31731*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

DIGITAL DEMODULATOR Patent Application

Thomas A. Shull, inventor (to NASA) Filed 18 Jul. 1980 9 p

(NASA-Case-LAR-12659-1; US-Patent-Appl-SN-171928) Avail: NTIS HC A02/MF A01 CSCL 09C

A digital demodulator for converting pulse code modulated (PCM) data from phase-shift key (PSK) to non-return-to-zero (NRZ-L) and to bio phase (BiO-L) is described. The demodulator is composed of standard integrated logic circuits. The key to the demodulation function is a pair of cross coupled one shot multivibrators which, with a flip-flop produce the NRZ-L. In order to generate BiO-L, the PSK carrier is constrained to be 2 to the n times the data bit rate. If NRZ-L is all that is required, the circuitry is greatly simplified and the 2 to the n times bit rate constraint can be removed from the carrier. A flip-flop, an OR gate, an AND gate, and a binary counter generate the bit rate clock BTCK for the NRZ-L. The remainder of the circuitry is for converting the NRZ-L and BTCK into BiO-L. NASA



N80-32650* National Aeronautics and Space Administration. Pasadena Office, Calif.

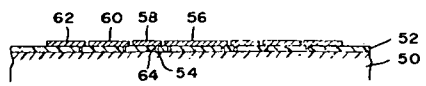
APPARATUS FOR MEASURING SEMICONDUCTOR DEVICE RESISTANCE Patent

Walter J. Matzen, inventor (to NASA) (Texas Instruments, Inc., Dallas) Issued 19 Aug. 1980 8 p Filed 23 Jun. 1978 Supersedes N78-28340 (16 - 19, p 2520) Sponsored by NASA

(NASA-Case-NPO-14424-1; NASA-Case-NPO-14430-1; US-Patent-4,218,650; US-Patent-Appl-SN-918534; US-Patent-Class-324-62; US-Patent-Class-324-64) Avail: US Patent and Trademark Office CSCL 09A

A test structure is described for enabling the accurate measurement of the resistance characteristics of a semiconductor material and includes one or more pairs of electrical terminals disposed on the surface of the material to enable measurements of the resistance encountered by currents passed between the terminals. A pair of terminals includes a first terminal extending in a closed path, such as a circle, around a second terminal, so that all currents flowing between the terminals flow along a region of known width and length. Two or more pairs of concentric terminals can be utilized, wherein the ratio of radii of each pair of terminals is the same as the ratio for all other pairs of terminals, to facilitate the calculation of the contact resistance between each terminal and the semiconductor surface, as well as the calculation of the resistance of the semiconductor material apart from the effect of the terminal to semiconductor contact resistances.

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



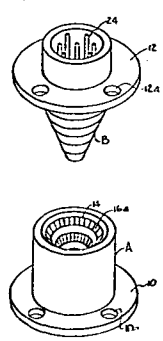
N80-32651*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

ELECTRICAL SELF-ALIGNING CONNECTOR Patent Application

Keith H. Clark and Donald R. Scott, inventors (to NASA) Filed 15 Jul. 1980 13 p

(NASA-Case-MFS-25211-1; US-Patent-Appl-SN-168995) Avail: NTIS HC A02/MF A01 CSCL 09A

A self aligning electrical connector device including a receptacle component having a conically contoured interior and a plug component having a correspondingly contoured conical body receivable in the receptacle component is disclosed. The plug component includes a plurality of spaced conductive ring elements having a mating face and the receptacle component includes a plurality of corresponding spaced conductive ring elements providing mating interface with the mating face of the ring elements of the plug component when connected therewith. Each ring element of the receptacle component includes a plurality of segmented portions which defect downwardly when the plug component is inserted therein to assert a biasing force against the face of the ring elements of the plug component providing positive electrical contact and connection between the ring elements of the components. NASA



N80-33679*# National Aeronautics and Space Administration. Pasadena Office, Calif.

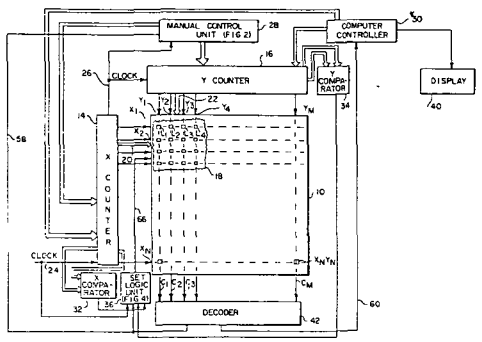
CONTROL MEANS FOR A SOLID STATE CROSSBAR SWITCH Patent Application

Tage O. Anderson, inventor (to NASA) (JPL) Filed 29 Sep. 1980 20 p

(Contract NAS7-100)

(NASA-Case-NPO-15066-1; US-Patent-Appl-SN-191744) Avail: NTIS HC A02/MF A01 CSCL 09C

A control system for a solid state crossbar switch is described which allows a number of switch control and interrogation functions to be implemented by time sharing related circuitry. The crossbar switch includes a number of X ports and Y ports. Each X-Y port intersection designates a specific X-Y intersection latch which controls a number of associated switches for interconnecting one set of data lines associated with the X port to another set of data lines associated with the Y port. The control system continuously and sequentially addresses each of the X-Y intersection latches at a 10 megahertz rate. During this continual and sequential addressing, the control circuitry includes a capability for (1) interrogating each intersection latch for determining which are in a set condition; (2) ensuring that only one X-Y intersection latch is set on an X row and Y column defining that latch; (3) resetting all of the X-Y intersection latches; and (4) determining which of the X-Y intersection latches are in a set condition. NASA



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.*

N80-24573* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

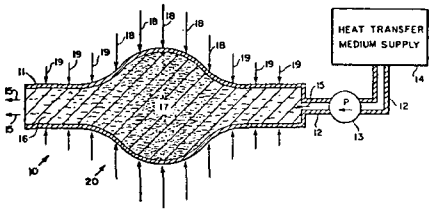
HEAT EXCHANGER AND METHOD OF MAKING Patent

Anthony Fortini and John M. Kazaroff, inventors (to NASA) Issued 29 Apr. 1980 6 p Filed 30 Nov. 1977 Supersedes N79-21313 (17 - 02, p 0164) Div. of US Patent Appl. SN-559846, filed 19 Mar. 1975, US Patent No-4,108,241

(NASA-Case-LEW-12441-2; US-Patent-4,199,937; US-Patent-Appl-SN-856462; US-Patent-Class-60-267; US-Patent-Class-239-127.1; US-Patent-Appl-SN-559846) Avail: US Patent and Trademak Office CSCL 20D

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

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



35 INSTRUMENTATION AND PHOTOGRAPHY

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

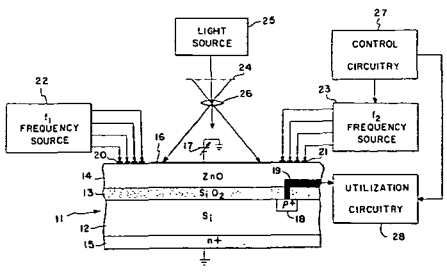
For aerial photography see *43 Earth Resources.* For related information see also *06 Aircraft Instrumentation,* and *19 Spacecraft Instrumentation.*

N80-22661*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

AN IMAGE READOUT DEVICE WITH ELECTRICALLY VARIABLE SPATIAL RESOLUTION Patent Application

Harry F. Benz, inventor (to NASA) Filed 28 Mar. 1980 12 p (NASA-Case-LAR-12633-1; US-Patent-Appl-SN-135039) Avail: NTIS HC A02/MF A01 CSCL 14E

The use of a standing acoustic wave charge storage device as an image readout device is described. A frequency f sub 1 is applied to the storage transfer device to create a traveling electric field in the device in one direction along a straight line. A second frequency f sub 2 which is a harmonic of f sub 1, has the same amplitude, and is phase stable with f sub 1 and is applied to the charge transfer device to create a traveling electric field in the opposite direction. Consequently, a standing wave is created along the straight line. When an image is focussed on the charge transfer device, light is stored in the wells of the standing wave. When the frequency f sub 2 is removed, the stored charges are moved to an output terminal. This terminal is connected to a utilization device where the received charges represent the image on the surface of the charge transfer device along a projection of the straight line. NASA



N80-26635* National Aeronautics and Space Administration. Pasadena Office, Calif.

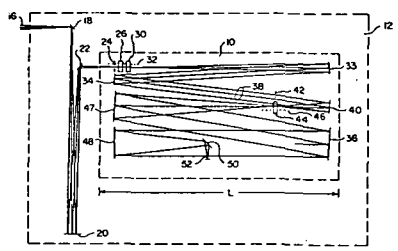
COOLED ECHELLE GRATING SPECTROMETER Patent

Reinhard Beer, inventor (to NASA) (JPL) Issued 27 May 1980 6 p Continuation of abandoned US Patent Appl. SN-646333, filed 2 Jan. 1976 Sponsored by NASA

(NASA-Case-NPO-14372-1; US-Patent-4,205,229; US-Patent-Appl-SN-956529; US-Patent-Class-250-352; US-Patent-Class-250-338; US-Patent-Class-250-353; US-Patent-Class-356-328; US-Patent-Appl-SN-646333) Avail: US Patent and Trademark Office CSCL 14B

A cooled echelle grating spectrometer for detecting wavelengths between one micron and fifteen microns is disclosed. More specifically, the spectrometer has a cross-dispersing grating for ordering infrared energy and an echelle grating for further ordering of the infrared energy. Ordered radiation from the echelle grating is sensed by a detecting means. Also disclosed is use of a Schmidt camera for focusing the further ordered radiation from the echelle grating onto a detector array having individual detectors dispersed on a plane which substantially corresponds to a curved focal plane of the Schmidt camera. A spectrometer constructed according to the teachings of the present invention will continuously cover the spectrum between one micron and fifteen microns and have a resolution of 0.1/cm.

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



N80-28686* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

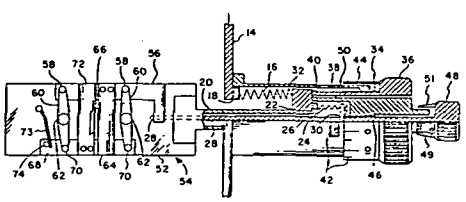
DUAL ACTING SLIT CONTROL MECHANISM Patent

Gustav L. Struthoff, inventor (to NASA) (Rensselaer Polytechnic Inst.) Issued 15 Jul. 1980 4 p Filed 8 Sep. 1978 Supersedes N78-32399 (16 - 23, p 3081) Sponsored by NASA

(NASA-Case-LAR-11370-1; US-Patent-4,213,051; US-Patent-Appl-SN-940689; US-Patent-Class-250-457; US-Patent-Class-250-491; US-Patent-Class-250-513) Avail: US Patent and Trademark Office CSCL 14B

A dual acting control system for mass spectrometers is described, which permits adjustment of the collimating slit width and centering of the collimating slit while using only one vacuum penetration. Coaxial shafts, each with independent vacuum bellows are used to independently move the entire collimating assembly or to adjust the slit dimension through a parallelogram linkage.

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



N80-28687* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

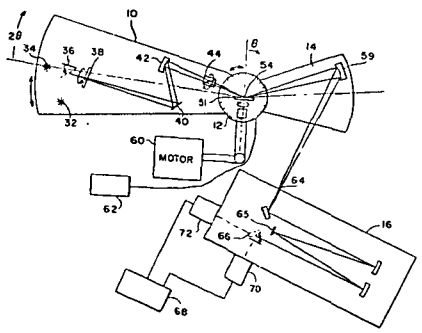
VISIBLE AND INFRARED POLARIZATION RATIO SPECTRO-REFLECTOMETER Patent

Carmen E. Batten, inventor (to NASA) Issued 1 Jul. 1980 11 p Filed 28 Jul. 1978 Supersedes N78-32398 (16 - 24, p 3179)

(NASA-Case-LAR-12285-1; US-Patent-4,210,401; US-Patent-Appl-SN-929087; US-Patent-Class-356-369; US-Patent-Class-356-244) Avail: US Patent and Trademark Office CSCL 14B

The instrument assists in determining the refractive index and absorption index, at different spectral frequencies, of a solid sample by illuminating the sample at various angles in incidence and measuring the corresponding reflected intensities at various spectral frequencies and polarization angles. The ratio of the intensity of the reflected light for parallel polarized light to that for perpendicular polarized light at two different angles of incidence can be used to determine the optical constants of the sample. The invention involves an apparatus for facilitating the utilization of a wide variety of angles of incidence. The light source and polarizing element are positioned on an outer platform; the sample is positioned on an inner platform. The two platforms rotate about a common axis and cooperate in their rotation such that the sample is rotated one degree for every two degrees of rotation of the light source. This maintains the impingement of the reflected light upon the detector for any angle of incidence without moving or adjusting the detector which allows a continuous change in the angle of incidence.

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



N80-29635*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

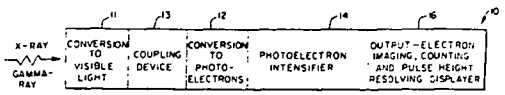
LOW INTENSITY X-RAY AND GAMMA-RAY IMAGING SPECTROMETER Patent Application

Lo I. Yin, inventor (to NASA) Filed 30 Jul. 1980 29 p

(NASA-Case-GSC-12587-1; US-Patent-Appl-SN-173524) Avail: NTIS HC A03/MF A01 CSCL 14B

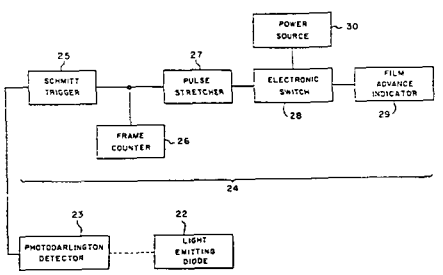
An imaging spectrometer includes a shield which is opaque to visible light and tranparent to X-ray or gamma-ray photons, and a scintillator which converts the X-ray or gamma-ray photons to visible-light photons. An input fiber optics plate guides the visible light pohotons in the same spatial position to photo-cathode which coverts them to photoelectrons. A chevron, curved, or Z configuration microcahannel plate amplifier, operated far below saturation, but capable of a 10 to the 4th to 10 to the 7th power gain, receives the photoelectrons and intensifies them. The intensified electrons are then converted back to visible-light photons by an output phosphor screen. An output fiber optics plate guides the visible-lifght photons in the same spatial position to a digitizing video camera and a digital information processor

which indicates the spatial position, number, and efficient energy of the incoming X-ray or gamma ray photons. NASA



N80-31774*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
FILM ADVANCE INDICATOR Patent Application
E. Thomas Freeman, Charles W. Stump, and Francis R. Dreisbach, inventors (to NASA) Filed 18 Jul. 1980 9 p
(NASA-Case-LAR-12474-1; US-Patent-Appl-SN-171934) Avail: NTIS HC A02/MF A01 CSCL 14E

A film advancement indicator which includes an optical sensor that detects the rotational movement of a disc that rotates only when the film advances is described. When the film does not advance an indicator light is activated. A counter is included in the electronic circuit to determine the number of film frames advanced. NASA

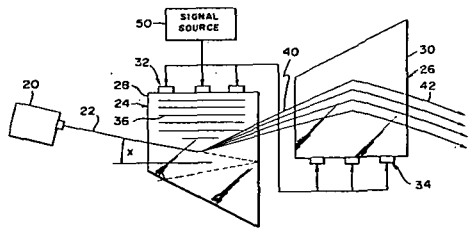


36 LASERS AND MASERS

Includes parametric amplifiers.

N80-24602*# National Aeronautics and Space Administration. Pasadena Office, Calif.
COHERENTLY PULSED LASER SOURCE Patent Application
Jack S. Margolis, inventor (to NASA) (JPL) Filed 15 May 1980 12 p
(Contract NAS7-100)
(NASA-Case-NPO-15111-1; US-Patent-Appl-SN-150040) Avail: NTIS HC A02/MF A01 CSCL 20E

An electronically controllable apparatus is described which modulates a continuous wave laser beam so as to produce an output beam consisting of coherent 'pulses' that are electronically controllable as to both pulse repetition rate and pulse width. The apparatus includes two acoustic devices positioned so that the laser beam passes through them in sequence, and an apparatus for passing sound waves through the devices to frequency shift the laser radiation as well as to diffract it. Each acoustic device generates sound waves containing a group of frequencies which result in spaced pulses. The spreading of a laser beam which emanates from the first acoustic device is countered by the second acoustic device to produce a collimated, coherently pulses, laser beam. NASA

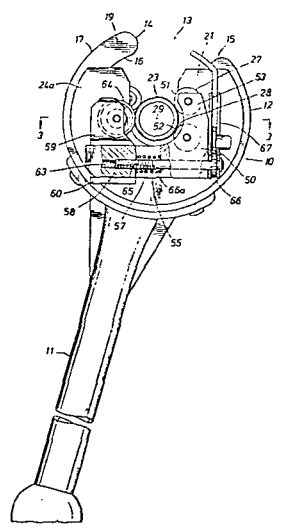


37 MECHANICAL ENGINEERING

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

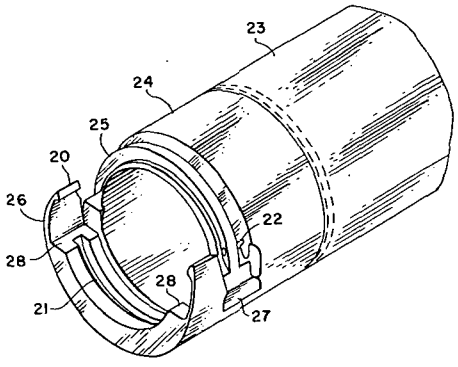
N80-22703*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
OPEN ENDED RATCHET TYPE TUBING CUTTER Patent Application
Anthony S. Girala, inventor (to NASA) Filed 9 Apr. 1980 19 p
(NASA-Case-MSC-18538-1; US-Patent-Appl-SN-138944) Avail: NTIS HC A02/MF A01 CSCL 13I

A self-clamping tube and piping cutting tool requiring limited angular motion is described. It includes a handle attached to a C-shaped housing and has an opening sized to admit a pipe. Rotatably mounted within the housing is a C-shaped tool body carrying a set of clamping and support rolls and an edged cutting roll. These rolls contact a pipe at three circumferential points. Cutter advancing means advance the cutting roll toward the support rollers. The support rolls and cutting roll are rotatable independently of the C-shaped housing. A one way ratchet mechanism disposed between the C-shaped housing and the C-shaped tool body permits operation by movement in one rotational direction about the pipe axis. In another embodiment, the tool body is rotated by a power driven mechanism. In addition, an automatic cutter advancing means can be provided. NASA



N80-22704*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
MECHANICAL END JOINT SYSTEM FOR STRUCTURAL COLUMN ELEMENTS Patent Application.
Harold G. Bush and Richard E. Wallsom, inventors (to NASA) (Vought Corp., Hampton, Va.) Filed 5 Dec. 1979 17 p
(NASA-Case-LAR-12482-1; US-Patent-Appl-SN-100611) Avail: NTIS HC A02/MF A01 CSCL 13I

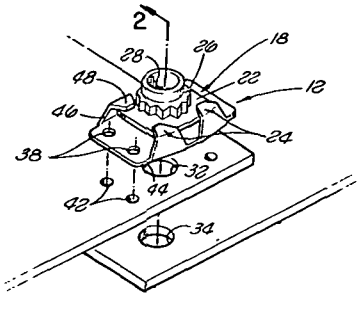
A mathematical end joint system, useful for the transverse connection of strut elements to a common mode is described. Included are node joint half with semicircular tongue and groove and a strut joint half with semicircular tongue and groove. The two joint halves were engaged transversely and the connection was made secure by the inherent physical property characteristics of locking latches or by a spring-actioned shaft. A quick release mechanism is also described which provides rapid disengagement of the joint halves. NASA



N80-23653* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
FLOATING NUT RETENTION SYSTEM Patent
James F. Charles (Rockwell International Corp., Downey, Calif.) and Harry A. Theakston, inventors (to NASA) (Rockwell International Corp., Downey, Calif.) Issued 18 Mar. 1980 5 p Filed 31 Aug. 1978 Supersedes N78-32931 (16 - 23, p 3085) Sponsored by NASA
(NASA-Case-MSC-16938-1; US-Patent-4,193,435; US-Patent-Appl-SN-938582; US-Patent-Class-151-41.76) Avail: US Patent and Trademark Office CSCL 13I

A floating nut retention system includes a nut with a central aperture. An inner retainer plate has an opening which is fixedly aligned with the nut aperture. An outer retainer member is formed of a base plate having an opening and a surface adjacent to a surface of the inner retainer plate. The outer retainer member includes a securing mechanism for retaining the inner retainer plate adjacent to the outer retainer member. The securing mechanism enables the inner retainer plate to float with respect to the outer retainer number, while simultaneously forming a bearing surface for inner retainer plate.

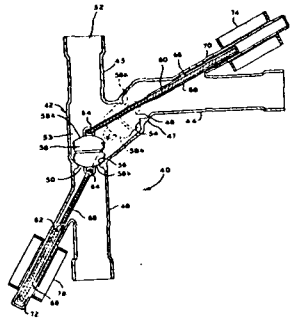
Official Gazette of the U.S. Patent and Trademark Office



N80-23654* National Aeronautics and Space Administration. Pasadena Office, Calif.
QUARTZ BALL VALVE Patent
Carl Goetz (Motorola, Inc., Phoenix, Ariz.) and William M. Ingle, inventors (to NASA) (Motorola, Inc., Phoenix, Ariz.) Issued 1 Apr. 1980 6 p Filed 31 Aug. 1978 Supersedes N79-10427 (17 - 01, p 0057) Sponsored by NASA
(NASA-Case-NPO-14473-1; US-Patent-4,195,666; US-Patent-Appl-SN-938300; US-Patent-Class-137-625.4; US-Patent-Class-251-86; US-Patent-Class-137-375; US-Patent-Class-251-138) Avail: US Patent and Trademark Office CSCL 13K

A ball valve particularly suited for use in the handling of highly corrosive fluids is described. It is characterized by a valve housing formed of communicating segments of quartz tubing, a pair of communicating sockets disposed in coaxial alignment with selected segments of tubing for establishing a pair of inlet ports communicating with a common outlet port, a ball formed of quartz material supported for displacement between the sockets and configured to be received alternately thereby, and a valve actuator including a rod attached to the ball for selectively displacing the ball relative to each of the sockets for controlling fluid flow through the inlet ports.

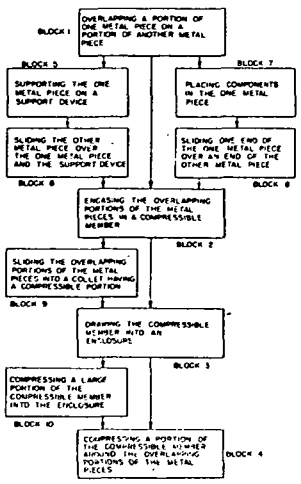
Official Gazette of the U.S. Patent and Trademark Office



N80-23655* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
METHOD AND APPARATUS FOR HOLDING TWO SEPARATE METAL PIECES TOGETHER FOR WELDING Patent
Sidney R. McClure, inventor (to NASA) Issued 8 Apr. 1980 9 p Filed 6 Apr. 1978 Supersedes N78-23434 (16 - 14, p 1851)
(NASA-Case-GSC-12318-1; US-Patent-4,196,840; US-Patent-Appl-SN-894213; US-Patent-Class-228-212; US-Patent-Class-228-44.1R; US-Patent-Class-228-222; US-Patent-Class-269-287; US-Patent-Class-219-160; US-Patent-Class-219-161) Avail: US Patent and Trademark Office CSCL 13H

A method of holding two separate metal pieces together for welding is described including the steps of overlapping a portion of one of the metal pieces on a portion of the other metal piece, encasing the overlapping metal piece in a compressible device, drawing the compressible device into an enclosure, and compressing a portion of the compressible d ,ce around the overlapping portions of the metal pieces for holding the metal pieces under constant and equal pressure during welding. The preferred apparatus for performing the method utilizes a support mechanism to support the two separate metal pieces in an overlapping configuration; a compressible device surrounding the support mechanism and at least one of the metal pieces, and a compressing device surrounding the compressible device for compressing the compressible device around the overlapping portions of the metal pieces, thus providing constant and equal

pressure at all points on the overlapping portions of the metal pieces. Official Gazette of the U.S. Patent and Trademark Office



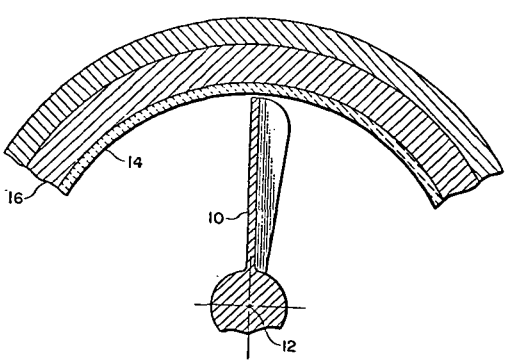
N80-24619*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

FULLY PLASMA-SPRAYED COMPLIANT BACKED CERAMIC TURBINE SEAL Patent Application

R. C. Bill, inventor (to NASA) Filed 30 Apr. 1980 7 p

(NASA-Case-LEW-13268-1; US-Patent-Appl-SN-145209) Avail: NTIS HC A02/MF A01 CSCL 11A

To maintain the minimum operating clearances between the blade tips and the lining of a high pressure turbine, a low temperature easily decomposable material, such as a polymer, in powder form is blended with a high temperature oxidation resistant metal powder. The two materials are simultaneously deposited on a substrate formed by the turbine casing. Alternately, the polymer powder may be added to the metal powder during plasma spraying. A ceramic layer is then deposited directly onto the metal-polymer composite. The polymer additive mixed with the metal is then completely volatilized to provide a porous layer between the ceramic layer and the substrate. Thermal stresses are reduced by virtue of the resulting porous structure which affords a cushion effect. By using plasma spraying for depositing both the powders of the metal and polymer material, as well as the ceramic powder, no brazing is required. NASA



N80-25660*# National Aeronautics and Space Administration. Pasadena Office, Calif.

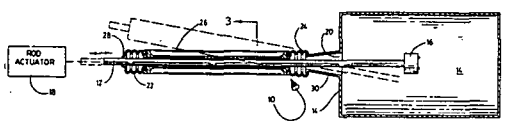
HERMETIC SEAL FOR A SHAFT Patent Application

Frank Lombardi, inventor (to NASA) (JPL) Filed 30 May 1980 13 p

(Contract NAS7-100)

(NASA-Case-NPO-15115-1; US-Patent-Appl-SN-154725) Avail: NTIS HC A02/MF A01 CSCL 11A

An hermetic seal for a linear rod with a portion projected axially through a port in a wall for a pressure chamber and supported for omnidirectional motion. The seal is characterized by a resilient, impervious, cylindrical body concentrically and integrally fixed to a shaft comprising a linear ordered array of annular flutes. A section integrally fixed to the wall of the chamber and concentrically related to the port comprises a second linear ordered array of annular flutes. A third section interposed between the first and second sections and integrally in coaxial alignment with them comprises an annular ordered array of linear flutes concentrically related to the shaft, which allows axial, angular, and pivoted motion of the rod. NASA



N80-26658* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

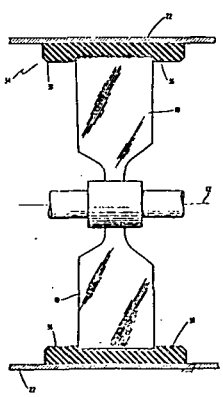
COMPOSITE SEAL FOR TURBOMACHINERY Patent

Robert C. Bill and Lawrence P. Ludwig, inventors (to NASA) Issued 10 Jun. 1980 4 p Filed 4 Aug. 1978 Supersedes N78-31103 (16 - 22, p 2897) Division of US Patent Appl. SN-801290, filed 27 May 1977, US Patent-4,135,851

(NASA-CASE-LEW-12131-2; US-Patent-4,207,024; US-Patent-Appl-SN-931090; US-Patent-Class-415-174; US-Patent-Class-415-196; US-Patent-Appl-SN-801290; US-Patent-4,135,851) Avail: US Patent and Trademark Office CSCL 11A

A gas path seal suitable for use with a turbine engine or compressor is provided. A shroud wearable or abradable by the abrasion of the rotor blades of the turbine or compressor shrouds the rotor blades. A compliant backing surrounds the shroud. The backing is a compliant material covered with a thin ductile layer. A mounting fixture surrounds the backing.

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



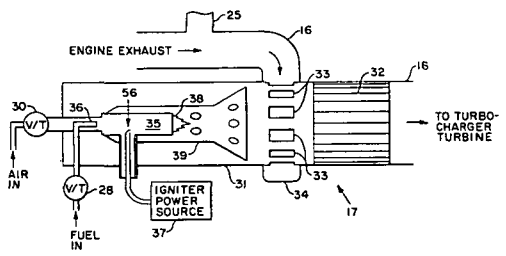
N80-26659*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

DIESEL ENGINE CATALYTIC COMBUSTOR SYSTEM Patent Application

Lloyd W. Ream, inventor (to NASA) Filed 6 Jun. 1980 10 p (NASA-Case-Lew-12995-1; US-Patent-Appl-SN-157150) Avail: NTIS HC A02/MF A01 CSCL 21A

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

NASA



N80-26660*# National Aeronautics and Space Administration. Pasadena Office, Calif.

IMPROVED METHOD FOR DRIVING TWO-PHASE TURBINES WITH ENHANCED EFFICIENCY Patent Application

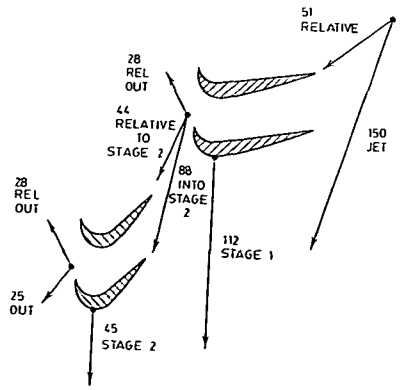
David G. Elliott, inventor (to NASA) (JPL) Filed 20 Jun. 1980 11 p

(Contract NAS7-100)

(NASA-Case-NPO-15037-1; US-Patent-Appl-SN-161257) Avail: NTIS HC A02/MF A01 CSCL 21A

A method is disclosed for driving a two-phase turbine characterized by an output shaft having at least one stage including a bladed rotor connected in driving relation with the shaft. A two-phase fluid is introduced into the stage at a known flow velocity and caused to pass through the rotor in order to impart angular velocity. The speed of the rotor is controlled so that the angular velocity of the blade tips is equal to at least 50% of the velocity of the flow of the two-phase fluid.

NASA



N80-26661*# National Aeronautics and Space Administration. Pasadena Office, Calif.

AN IMPROVED HEAD FOR HIGH SPEED SPINNER HAVING A VACUUM CHUCK Patent Application

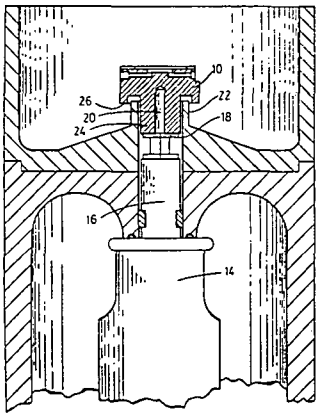
Frank Lombardi, inventor (to NASA) (JPL) Filed 27 Jun. 1980 12 p

(Contract NAS7-100)

(NASA-Case-NPO-15227-1; US-Patent-Appl-SN-163840) Avail: NTIS HC A02/MF A01 CSCL 13I

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

NASA



N80-28711* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

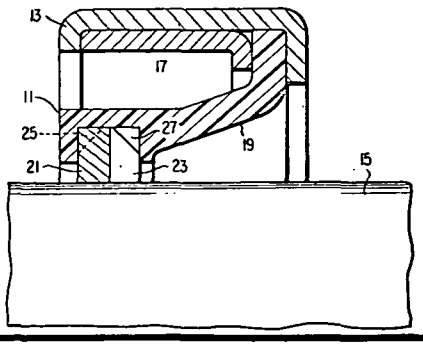
CIRCUMFERENTIAL SHAFT SEAL Patent

Lawrence P. Ludwig, inventor (to NASA) Issued 15 Jul. 1980 4 p Filed 31 Mar. 1976 Supersedes N76-20488 (14-11, p 1394)

(NASA-Case-LEW-12119-1; US-Patent-4,212,477; US-Patent-Appl-SN-672219; US-Patent-Class-277-193; US-Patent-Class-277-153; US-Patent-Class-277-224) Avail: US Patent and Trademark Office CSCL 11A

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

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



N80-29703* National Aeronautics and Space Administration. Pasadena Office, Calif.

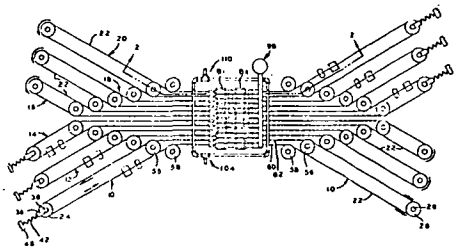
SYSTEM FOR SLICING SILICON WAFERS Patent

Earl R. Collins, inventor (to NASA) (JPL) Issued 4 Mar. 1980 6 p Filed 16 Oct. 1978 Supersedes N79-10245 (17 - 01, p 0033) Sponsored by NASA

(NASA-Case-NPO-14406-1; US-Patent-4,191,159; US-Patent-Appl-SN-951828; US-Patent-Class-125-21; US-Patent-Class-83-820) Avail: US Patent and Trademark Office CSCL 13I

An improved system is described which has at least one endless band saw blade that is characterized by a continuously regenerated cutting edge and is unidirectionally driven along a pair of courses extended in mutual parallelism through a cutting station located near the midportion of the courses. The blade is supported at the cutting station by pairs of guides continuously rotated through less than 360 deg of angular displacement during each cutting operation in order to continuously regenerate the blade supporting surfaces of the guide. Blade wobble is thus substantially eliminated.

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



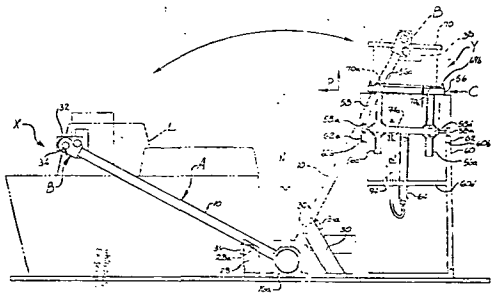
N80-29704*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

APPARATUS FOR SEQUENTIALLY TRANSPORTING CONTAINERS Patent Application

Jerry L. Hudgins, inventor (to NASA) Filed 11 Jul. 1980 20 p

(NASA-Case-MFS-23846; US-Patent-Appl-SN-168944) Avail: NTIS HC A02/MF A01 CSCL 13I

An apparatus for transferring and manipulating a plurality of containers in a sequence is disclosed including a mechanical manipulator arm having a gripping device which automatically picks up a container at a fixed pickup position and transfers it to a processing station. At a processing station, the container is loaded with silicon wafers and thereafter returned to the pickup and return station. A plurality of the containers may be processed in sequence from the fixed pickup position by providing a movable carriage upon which container pedestal platforms are supported, at least one of which is an elevator platform. Sensing switches may be provided for sensing movements of the arm, carriage, and elevator platform whereby the entire apparatus may be controlled automatically avoiding the need to handle the wafers manually to reduce the possibility of contamination. NASA



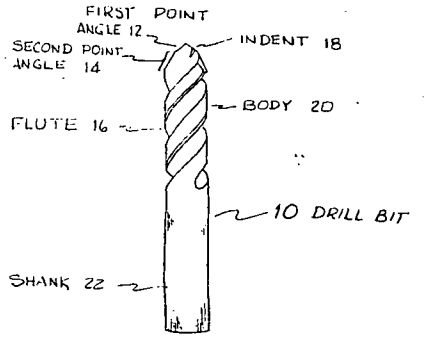
N80-29705*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

METHOD FOR MILLING AND DRILLING GLASS Patent Application

Stephen H. Rice, inventor (to NASA) Filed 30 Jun. 1980 13 p

(NASA-Case-GSC-12636-1; US-Patent-Appl-SN-173520) Avail: NTIS HC A02/MF A01 CSCL 13H

A process is disclosed for machining glass in which a rotating carbide working surface is placed under minimum pressure against an area of glass to be worked. Concurrently, the region between the working surface and the area of glass is wetted with a lubricant consisting essentially of a petroleum carrier, a complex mixture of esters, and a complex mixture of naturally occurring aromatic oils. NASA



N80-31790* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

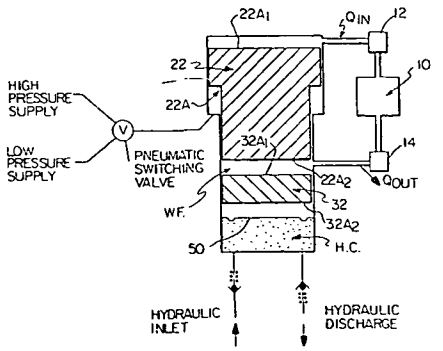
FREE-PISTON REGENERATIVE HOT GAS HYDRAULIC ENGINE Patent

Donald G. Beremand, inventor (to NASA) Issued 5 Aug. 1980 7 p Filed 12 Oct. 1978 Supersedes N79-10426 (17 - 12, p 0057)

(NASA-Case-LEW-12274-1; US-Patent-4,215,548; US-Patent-Appl-SN-950876; US-Patent-Class-60-520; US-Patent-Class-417-383) Avail: US Patent and Trademark Office CSCL 13I

A displacer piston which is driven pneumatically by a high-pressure or low-pressure gas is included in a free-piston regenerative hydraulic engine. Actuation of the displacer piston circulates the working fluid through a heater, a regenerator and a cooler. The present invention includes an inertial mass such as a piston or a hydraulic fluid column to effectively store and supply energy during portions of the cycle. Power is transmitted from the working fluid to a hydraulic fluid across a diaphragm or lightweight piston to achieve a hydraulic power out-put. The displacer piston of the present invention may be driven pneumatically, hydraulically or electromagnetically. In addition, the displacer piston and the inertial mass of the present invention may be positioned on the same side of the diaphragm member or may be separated by the diaphragm member.

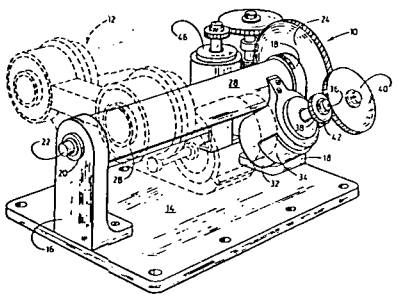
Official Gazette of the U.S. Patent and Trademark Office



N80-32716* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
REDUNDANT MOTOR DRIVE SYSTEM Patent
John A. Calvert, inventor (to NASA) Issued 5 Aug. 1980 6 p Filed 4 Aug. 1978 Supersedes N78-28460 (16 - 19, p 2534)
(NASA-Case-MFS-23777-1; US-Patent-4,215,592; US-Patent-Appl-SN-931217; US-Patent-Class-74-661; US-Patent-Class-74-425; US-Patent-Class-74-665C; US-Patent-Class-318-15) Avail: US Patent and Trademark Office CSCL 13I

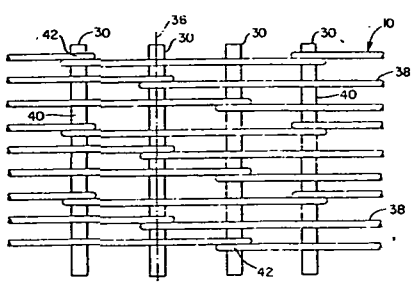
A drive system characterized by a base supporting a pair of pillars arranged in spaced parallelism, a shaft extended between and supported by the pillars for rotation about the longitudinal axis thereof, a worm gear affixed to the shaft and supported in coaxial relation therewith is described. A bearing housing of a sleeve like configuration is concentrically related to the shaft and is supported thereby for free rotation. A first and a second quiescent drive train, alternatively activatable, is provided for imparting rotation into said bearing housing. Each of the drive trains is characterized by a selectively energizable motor connected to a spur gear.

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



N80-32717* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
BELT FOR TRANSMITTING POWER FROM A COGGED DRIVING MEMBER TO A COGGED DRIVEN MEMBER Patent
Hossein Bahiman, inventor (to NASA) Issued 5 Aug. 1980 4 p Filed 18 Sep. 1978 Supersedes N78-32435 (16 - 23, p 3086)
(NASA-Case-GSC-12289-1; US-Patent-4,215,590; US-Patent-Appl-SN-943086; US-Patent-Class-474-205; US-Patent-Class-198-847; US-Patent-Class-198-848) Avail: US Patent and Trademark Office CSCL 13I

A belt for transmitting power from a cogged driving member to a cogged driven member such as a pair of wheel sprockets is described. The belt has inflexible teeth spaced along the direction of its travel. Each of the teeth has a longitudinal axis transverse to the direction of belt travel. The belt also includes substantially inextensible fasts spaced transversely to the direction of belt travel. The fasts extend in the direction of belt travel adjacent to the teeth and are looped around preselected numbers of the teeth. Official Gazette of the U.S. Patent and Trademark Office



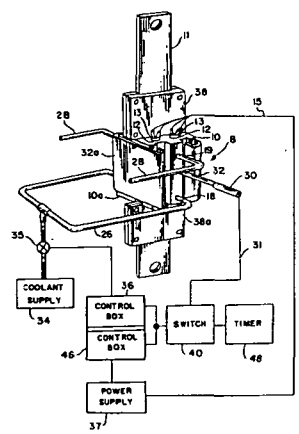
39 STRUCTURAL MECHANICS

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

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

N80-25693*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
HEATING AND COOLING SYSTEM Patent Application
Leland Imig and Mickey R. Gardner, inventors (to NASA) Filed 30 Apr. 1980 13 p
(NASA-Case-LAR-12393-1; US-Patent-Appl-SN-145208) Avail: NTIS HC A02/MF A01 CSCL 20K

An apparatus capable of cyclic heating and cooling of a test specimen undergoing fatigue testing is disclosed. Cryogenic fluid is passed through a block clamped to the specimen to cool the block and the specimen. Heating cartridges penetrate the block to heat the block and the specimen to very hot temperatures. Control apparatus is provided to alternately activate the cooling and heating modes to effect cyclic heating and cooling between very hot and very cold temperatures. The block is constructed of minimal mass to facilitate the rapid temperature change thereof. NASA



43 EARTH RESOURCES

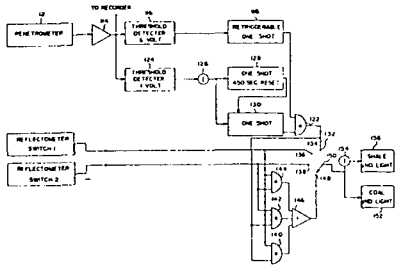
Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.

For instrumentation see *35 Instrumentation and Photography*.

N80-23711* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
COAL-SHALE INTERFACE DETECTOR Patent
Harry Reid, Jr., inventor (to NASA) Issued 1 Apr. 1980 8 p Filed 3 Nov. 1977
(NASA-Case-MFS-23720-1; US-Patent-4,195,512; US-Patent-Appl-SN-848419; US-Patent-Class-73-12; US-Patent-Class-73-82) Avail: US Patent and Trademark Office CSCL 08I

A coal-shale interface detector for use with coal cutting equipment is described. The detector consists of a reciprocating hammer with an accelerometer to measure the impact of the hammer as it penetrates the ceiling or floor surface of a mine. Additionally, a pair of reflectometers simultaneously view the same surface, and the outputs from the accelerometer and

reflectometers are detected and jointly registered to determine when an interface between coal and shale is being cut through.
Official Gazette of the U.S. Patent and Trademark 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.

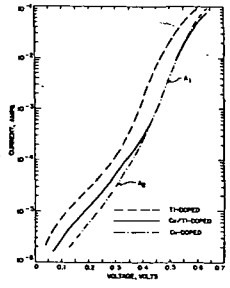
For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *85 Urban Technology and Transportation.*

N80-24741* National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD OF MITIGATING TITANIUM IMPURITIES EFFECTS IN P-TYPE SILICON MATERIAL FOR SOLAR CELLS Patent

Amal M. Salama, inventor (to NASA) (JPL) Issued 6 May 1980 7 p Filed 31 Jan. 1979 Supersedes N79-17315 (17 - 08, p 1001) Sponsored by NASA
(NASA-Case-NPO-14635-1; US-Patent-4,210,622;
US-Patent-Appl-SN-008212; US-Patent-Class-156-605;
US-Patent-Class-156-617SP; US-Patent-Class-156-DIG.64;
US-Patent-Class-136-89SG; US-Patent-Class-252-62.3E) Avail: US Patent and Trademark Office CSCL 10A

An economical way to reduce the deleterious effects of titanium, one of the impurities present in metallurgical grade silicon material, is disclosed. By adding copper to approximately the same concentration level of the titanium during the melting process, the conversion efficiency will be restored to about 99.3% of what it would have been if the single crystal silicon had been grown free of titanium impurities.
Official Gazette of the U.S. Patent and Trademark Office

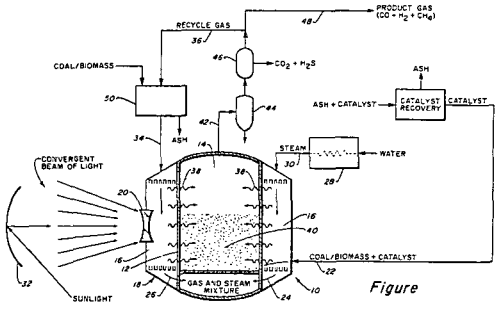


N80-24747*# National Aeronautics and Space Administration. Pasadena Office, Calif.

SOLAR-HEATED FLUIDIZED BED GASIFICATION SYSTEM Patent Application

Shaik A. Qader, inventor (to NASA) (JPL) Filed 15 May 1980 13 p
(Contract NAS7-100)
(NASA-Case-NPO-15071-1; US-Patent-Appl-SN-150115) Avail: NTIS HC A02/MF A01 CSCL 10A

A solar-powered fluidized bed gasification system for gasifying carbonaceous material is disclosed. The system includes a solar gasifier which is heated by fluidizing gas and steam. Energy to heat the gas and steam is supplied by a high heat capacity refractory honeycomb which surrounds the fluid bed reactor zone. The high heat capacity refractory honeycomb is heated by solar energy focused on the honeycomb by solar concentrator through solar window. The fluid bed reaction zone is also heated directly by thermal contact to the high heat capacity ceramic honeycomb with the walls of the fluidized bed reactor. Provisions are also made for recovering and recycling catalysts used in the gasification process. A back-up furnace is provided for start-up procedures and for supplying heat to the fluid bed reaction zone when adequate supplies of solar energy are not available. NASA



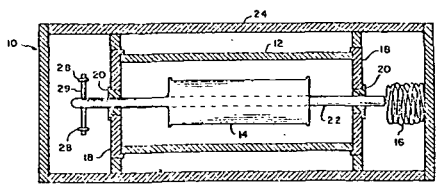
Figure

N80-29834* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

NATURAL TURBULENCE ELECTRICAL POWER GENERATOR Patent

David C. Grana and Richard T. Wilem, inventors (to NASA) Issued 4 Mar. 1980 5 p Filed 3 Mar. 1978 Supersedes N78-22468 (16 - 13, p 1719)
(NASA-Case-LAR-11551-1; US-Patent-4,191,893;
US-Patent-App-SN-883090; US-Patent-Class-290-53;
US-Patent-Class-310-30) Avail: US Patent and Trademark Office CSCL 10B

An energy conversion apparatus is disclosed in which a stator, fixed to a watertight housing, is coupled to a rotor by a helical spring which suspends the rotor from the housing. Natural turbulence of a fluid, such as water or air, causes acceleration of the housing, and hence, acceleration of the stator. Inertia of the rotor, coupled to the stator through the helical spring and the housing, causes relative motion, both longitudinal and rotational, between the stator and the rotor. The rotational motion between the rotor, and the stator is used to generate electrical current. Official Gazette of the U.S. Patent and Trademark Office



N80-29835* National Aeronautics and Space Administration. Pasadena Office, Calif.

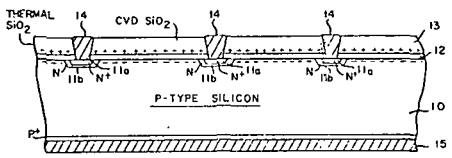
INDUCED JUNCTION SOLAR CELL AND METHOD OF FABRICATION Patent

Joseph Maserjian (JPL), Shy Shiun Chern (JPL), and Seung P. Li, inventors (to NASA) (JPL) Issued 16 May 1978 9 p Filed 15 Jun. 1976 Sponsored by NASA

(NASA-Case-NPO-13786-1; US-Patent-4,090,213; US-Patent-Appl-SN-696374; US-Patent-Class-357-30; US-Patent-Class-357-52; US-Patent-Class-357-91; US-Patent-CLass-148-1.5) Avail: US Patent and Trademark Office CSCL 10A

An induced junction solar cell is fabricated on a p-type silicon substrate by first diffusing a grid of criss-crossed current collecting n+ stripes and thermally growing a thin SiO2 film, and then, using silicon-rich chemical vapor deposition (CVD), producing a layer of SiO2 having inherent defects, such as silicon interstices, which function as deep traps for spontaneous positive charges. Ion implantation increases the stable positive charge distribution for a greater inversion layer in the p-type silicon near the surface. After etching through the oxide to parallel collecting stripes, a pattern of metal is produced consisting of a set of contact stripes over the exposed collecting stripes and a diamond shaped pattern which functions as a current collection bus. Then the reverse side is metallized.

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



N80-29843*# National Aeronautics and Space Administration. Pasadena Office, Calif.

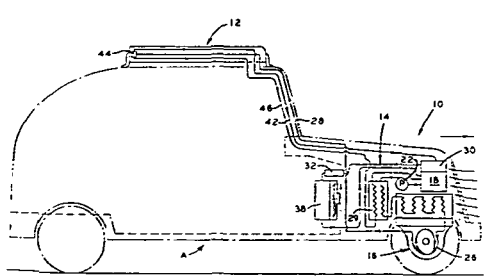
AUTOMOTIVE ABSORPTION AIR CONDITIONER UTILIZING SOLAR AND MOTOR WASTE HEAT Patent Application

Zenon Popinski, inventor (to NASA) (JPL) Filed 30 Jul. 1980 15 p

(Contract NAS7-100)

(NASA-Case-NPO-15183; US-Patent-Appl-SN-173519) Avail: NTIS HC A02/MF A01 CSCL 10A

An absorption cycle air conditioning system for use as a space cooling system in an electrically powered motor vehicle is disclosed. The system is of a lightweight design and has a capability for achieving vehicular space cooling with minimal attendant power requirements. The system is adapted to utilize solar and motor waste heat. J.M.S.



N80-32850*# National Aeronautics and Space Administration. Pasadena Office, Calif.

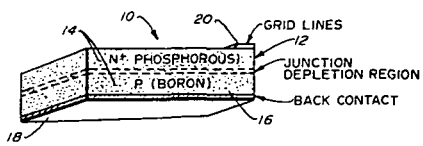
IMPROVING THE EFFICIENCY OF SILICON SOLAR CELLS CONTAINING CHROMIUM Patent Application

Amal M. Salama, inventor (to NASA) (JPL) Filed 11 Sep. 1980 16 p

(Contract NAS7-100)

(NASA-Case-NPO-15179-1; US-Patent-Appl-SN-185867) Avail: NTIS HC A02/MF A01 CSCL 10A

Efficiency of silicon solar cells containing about 10 to the 15th power atoms/cu cm of chromium is improved about 26% by thermal annealing of the silicon wafer at a temperature of 200 C to form chromium precipitates having a diameter of less than 1 Angstrom. Further improvement in efficiency is achieved by scribing laser lines onto the back surface of the wafer at a spacing of at least 0.5 mm and at a depth of less than 13 micrometers to preferentially precipitate chromium near the back surface and away from the junction region of the device. This provides an economical way to improve the deleterious effects of chromium, one of the impurities present in metallurgical grade silicon material. NASA



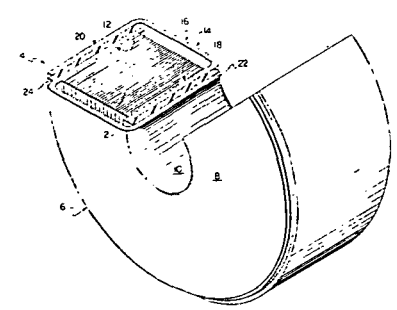
N80-33857*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

TOROIDAL CELL AND BATTERY Patent Application

William J. Nagle, inventor (to NASA) Filed 28 Mar. 1980 13 p

(NASA-Case-LEW-12918-1; US-Patent-Appl-SN-134855) Avail: NTIS HC A02/MF A01 CSCL 10C

A toroidal cell is disclosed which includes a wound core disposed within a pair of toroidal channel shaped electrodes separated by nylon insulator. The shape of the case electrodes of this cell allows one doughnut shaped surface and the inner cylindrical case wall to be used as an electrode and a second planar doughnut shaped surface and the outer cylindrical case wall to be used as another electrode. Connectors may be used to stack two or more toroidal cells together by connecting the entire surface area of the electrode of one cell to the entire surface area of the electrode of a second cell. The central cavity of each toroidal cell may be used as a conduit for pumping a fluid through the toroidal cell to thereby cool the cell. NASA



46 GEOPHYSICS

Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics; and geomagnetism.

For space radiation see *93 Space Radiation.*

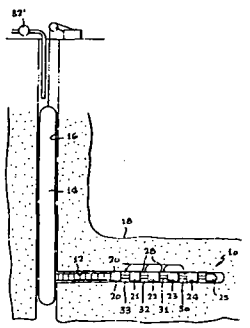
N80-24906* National Aeronautics and Space Administration. Pasadena Office, Calif.

GEOLOGICAL ASSESSMENT PROBE Patent

Earl R. Collins, inventor (to NASA) (JPL) Issued 8 Apr. 1980 8 p Filed 25 Sep. 1978 Supersedes N80-12642 (18 - 3, p 0365) Sponsored by NASA

(NASA-Case-NPO-14558-1; US-Patent-4,196,619; US-Patent-Appl-SN-945436; US-Patent-Class-73-155) Avail: US Patent and Trademark Office CSCL 08G

A probe is described which can be installed in a side hole that extends from a bore hole in the Earth, to assess the permeability of the strata surrounding the borehole. The probe is elongated and has a plurality of seals spaced therealong and sealed to the walls of the side hole to form a plurality of chambers sealed from one another. A tracer fluid injector on the probe can inject a tracer fluid into one of the chambers, while a tracer fluid detector located in another chamber can detect the tracer fluid, to thereby sense the permeability of the strata surrounding the side hole. The probe can include a train of modules, with each module having an inflatable packer which is inflated by the difference between the borehole pressure and the strata pressure. Official Gazette of the U.S. Patent and Trademark Office



47 METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

N80-26992*# National Aeronautics and Space Administration. Pasadena Office, Calif.

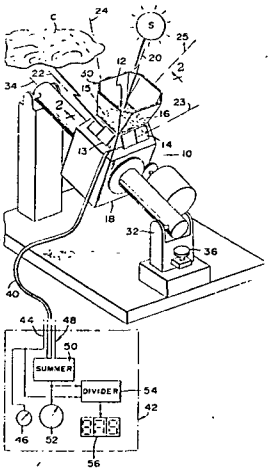
CLOUD COVER SENSOR Patent Application

Eric G. Laue, inventor (to NASA) (JPL) Filed 27 Jun. 1980 11 p

(Contract NAS7-100)

(NASA-Case-NPO-14936-1; US-Patent-Appl-SN-163837) Avail: NTIS HC A02/MF A01

An apparatus is described which provides a numerical indication of the cloudiness at a particular time of a day. The apparatus includes a frame holding several light sensors such as photovoltaic cells, with a direct sensor mounted to directly face the Sun and indirect sensors mounted to face different portions of the sky not containing the Sun. A light shield guards the direct sensor from most of the sky except a small portion contining the Sun, and also shields each of the indirect sensors from direct sunlight. The relative values of the outputs from the direct and indirect sensors, enables the generation of a numerical indication of the degree of cloudiness at a particular time of day. NASA



51 LIFE SCIENCES (GENERAL)

Includes genetics.

N80-27067* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

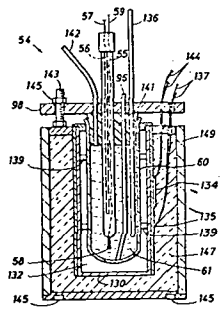
METHOD AND AUTOMATED APPARATUS FOR DETECTING COLIFORM ORGANISMS Patent

W. Preston Dill (Boeing Aerospace Co., Houston, Tex.), Rueben E. Taylor (Boeing Aerospace., Houston, Tex.), and Eldon L. Jeffers, inventors (to NASA) (Boeing Aerospace Co., Houston, Tex.) Issued 20 May 1980 14 p Filed 4 Apr. 1978 Sponsored by NASA

(NASA-Case-MSC-16777-1; US-Patent-4,204,037; US-Patent-Appl-SN-893657; US-Patent-Class-435-3; US-Patent-Class-23-230B; US-Patent-Class-204-195B; US-Patent-Class-422-68; US-Patent-Class-435-32; US-Patent-Class-435-34; US-Patent-Class-435-38; US-Patent-Class-435-39; US-Patent-Class-435-289; US-Patent-Class-435-290; US-Patent-Class-435-291; US-Patent-Class-435-311; US-Patent-Class-435-316) Avail: US Patent and Trademark Office CSCL 06C

Method and automated apparatus are disclosed for determining the time of detection of metabolically produced hydrogen by coliform bacteria cultured in an electroanalytical cell from the time the cell is inoculated with the bacteria. The detection time data provides bacteria concentration values. The apparatus is sequenced and controlled by a digital computer to discharge a spent sample, clean and sterilize the culture cell, provide a bacteria nutrient into the cell, control the temperature of the nutrient, inoculate the nutrient with a bacteria sample, measures

the electrical potential difference produced by the cell, and measures the time of detection from inoculation.
Official Gazette of the U.S. Patent and Trademark Office

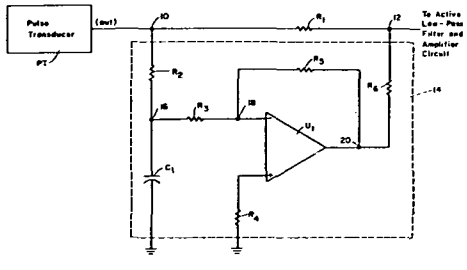


52 AEROSPACE MEDICINE

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

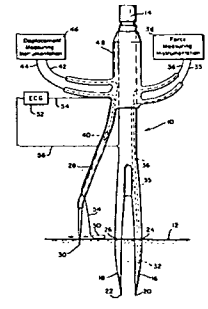
N80-23969* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
PULSE TRANSDUCER WITH ARTIFACT SIGNAL ATTENUATOR Patent
Wilbur H. Cash, Jr. (Martin Marietta Aerospace, Denver) and John T. Polhemus, inventors (to NASA) (Martin Marietta Aerospace, Denver) Issued 22 Apr. 1980 4 p Filed 26 Jul. 1978 Supersedes N78-28339 (16 - 19, p 2520) Sponsored by NASA
(NASA-Case-FRC-11012-1; US-Patent-4,198,988; US-Patent-Appl-SN-928137; US-Patent-Class-128-666; US-Patent-Class-128-690) Avail: US Patent and Trademark Office CSCL 06B

An artifact signal attenuator for a pulse rate sensor is described. The circuit for attenuating background noise signals is connected with a pulse rate transducer which has a light source and a detector for light reflected from blood vessels of a living body. The heart signal provided consists of a modulated dc signal voltage indicative of pulse rate. The artifact signal resulting from light reflected from the skin of the body comprises both a constant dc signal voltage and a modulated dc signal voltage. The amplitude of the artifact signal is greater and the frequency less than that of the heart signal. The signal attenuator circuit includes an operational amplifier for canceling the artifact signal from the output signal of the transducer and has the capability of meeting packaging requirements for wrist-watch-size packages. A.R.H.



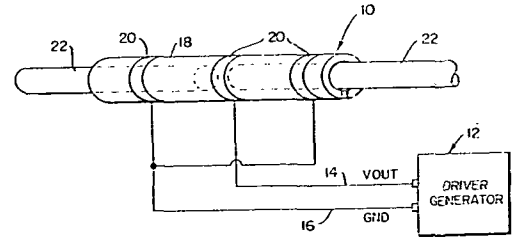
N80-27072* National Aeronautics and Space Administration. Pasadena Office, Calif.
SIMULTANEOUS MUSCLE FORCE AND DISPLACEMENT TRANSDUCER Patent
Cyril Feldstein (JPL), Gilbert W. Lewis (JPL), and Virgil H. Culler, inventors (to NASA) (JPL) Issued 27 May 1980 5 p Filed 30 Sep. 1977 Supersedes N80-12730 (18 - 03, p 0376) Sponsored by NASA
(NASA-Case-NPO-14212-1; US-Patent-4,204,544; US-Patent-Appl-SN-838308; US-Patent-Class-128-642; US-Patent-Class-128-774; US-Patent-Class-128-782; US-Patent-Class-33-125R; US-Patent-Class-73-781; US-Patent-Class-338-2) Avail: US Patent and Trademark Office CSCL 06B

A myocardial transducer for simultaneously measuring force and displacement within a very small area of myocardium is disclosed. The transducer comprised of an elongated body forked at one end to form an inverted Y shaped beam with each branch of the beam constituting a low compliant tine for penetrating the myocardium to a predetermined depth. Bonded to one of the low compliance tines is a small piezoresistive element for converting a force acting on the beam into an electrical signal. A third high compliant tine of the transducer, which measures displacement of the myocardium in a direction in line with the two low compliant tines, is of a length that just pierces the surface membrane. A small piezoresistive element is bonded to the third tine at its upper end where its bending is greatest. Displacement of the myocardium causes a deformation in curvature of the third tine, and the second small piezoresistive element bonded to the surface of its curved end converts its deformation into an electrical signal.
Official Gazette of the U.S. Patent and Trademark Office



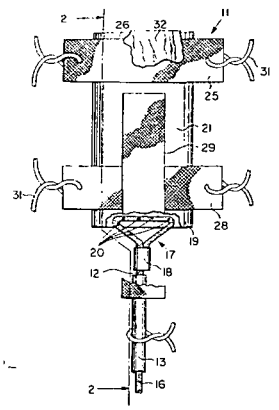
N80-27073*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AN IMPLANTABLE ELECTRICAL DEVICE Patent Application
Murzban D. Jhabvala, inventor (to NASA) Filed 27 May 1980 12 p
(NASA-Case-GSC-12560-1; US-Patent-Appl-SN-153246) Avail: NTIS HC A02/MF A01 CSCL 06B

A fully implantable and self-contained therapeutic device for stimulating the regeneration of severed nerves by electrical energy is disclosed. The device is composed of a flexible electrode array for surrounding damaged nerves and a signal generator for driving the electrode array with periodic electrical impulses of nanoampere magnitude to induce regeneration of the damaged nerves. NASA



N80-33081*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
POCKET ECG ELECTRODE Patent Application
Gordon F. Lund, inventor (to NASA) (NAS-NRC, Washington, D.C.) Filed 11 Sep. 1980 14 p Sponsored by NASA
(NASA-Case-ARC-11258-1; US-Patent-Appl-SN-185865) Avail: NTIS HC A02/MF A01 CSCL 06B

A low noise electrode suited for sensing electrocardiograms when chronically and subcutaneously implanted in a free ranging subject is described. The electrode comprises a pocket shaped electrically conductive member with a single entrance adapted to receive body fluids. The exterior of the member and the entrance region is coated with electrical insulation so that the only electrolyte/electrode interface is within the member, remote from artifact-generating tissue. Cloth straps are bonded to the member to permit the electrode to be sutured to tissue and to provide electrical lead flexure relief. NASA

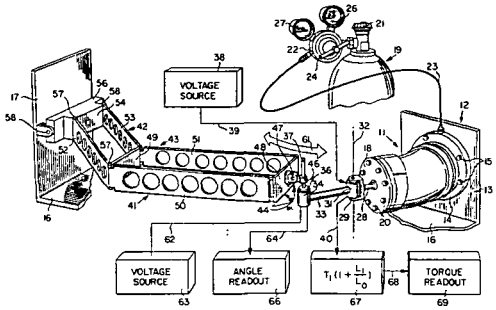


54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

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

N80-30043*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PRESSURE SUIT JOINT ANALYZER Patent Application
Hubert C. Vykukal and Bruce Webbon, inventors (to NASA) Filed 11 Jul. 1980 13 p
(NASA-Case-ARC-11314-1; US-Patent-Appl-SN-168943) Avail: NTIS HC A02/MF A01 CSCL 06Q

A measurement system for simultaneously measuring torque and angular flexure in a pressure suit joint. One end of a joint under test is held rigid, and a torque transducer is pivotably supported on the other movable end of the joint. A potentiometer is attached to the transducer by an arm. The wiper shaft of the potentiometer is gripped by a reference arm that rotates the wiper shaft the same angle as the flexure of joint. A signal, generated by the potentiometer, is representative of the joint flexure angle, and a compensation circuit coverts the output of the transducer to a signal representative of joint torque. NASA

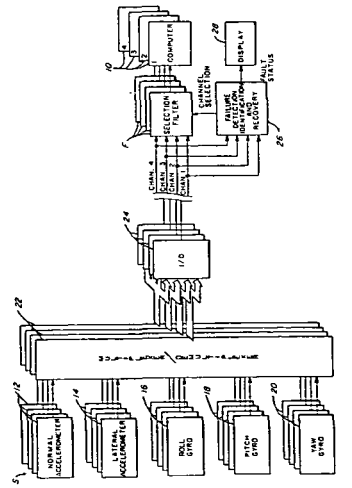


60 COMPUTER OPERATIONS AND HARDWARE

Includes computer graphics and data processing.
For components see *33 Electronics and Electrical Engineering*.

N80-30050*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
RECONFIGURING REDUNDANCY MANAGEMENT Patent Application
Hendrik C. Gelderloos, inventor (to NASA) (Honeywell, Inc., St. Petersburg, Fla.) Filed 30 Jul. 1980 21 p Sponsored by NASA
(NASA-Case-MSC-18498-1; US-Patent-Appl-SN-173518) Avail: NTIS HC A02/MF A01 CSCL 09B

Input singals from sensors in a redundancy management system are provided redundantly in parallel so that a primary control signal may be selected. Median value signals from groups of three sensors are detected in median value selectors of selection filters. The detected median value signals are then also compared in a subtractor/comparator to determine whether any of them exceeds the others by an amount greater than the signal level for a failed sensor. If so, the lowest level detected medium value signal is sent as the primary control signal. NASA



72 ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure and molecular spectra.

N80-27163* National Aeronautics and Space Administration. Pasadena Office, Calif.

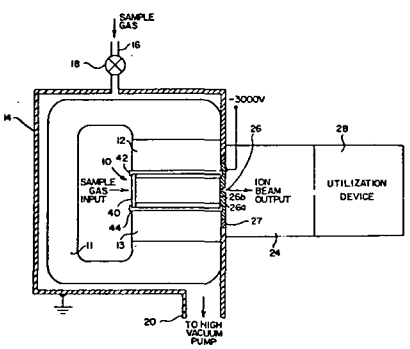
MINIATURE CYCLOTRON RESONANCE ION SOURCE USING SMALL PERMANENT MAGNET Patent

Vincent G. Anicich (JPL) and Wesley T. Huntress, Jr., inventors (to NASA) (JPL) Issued 3 Jun. 1980 7 p Filed 11 Sep. 1978 Supersedes N80-12851 (18 - 03, p 0391) Sponsored by NASA

(NASA-Case-NPO-14324-1; US-Patent-4,206,383; US-Patent-Appl-SN-940970; US-Patent-Class-313-362; US-Patent-Class-250-427; US-Patent-Class-313-156; US-Patent-Class-313-363) Avail: US Patent and Trademark Office CSCL 20H

An ion source using the cyclotron resonance principle is described. A miniaturized ion source device is used in an air gap of a small permanent magnet with a substantially uniform field in the air gap of about 0.5 inch. The device and permanent magnet are placed in an enclosure which is maintained at a high vacuum (typically 10 to the minus 7th power) into which a sample gas can be introduced. The ion beam end of the device is placed very close to an aperture through which an ion beam can exit into the apparatus for an experiment.

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



N80-33186* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

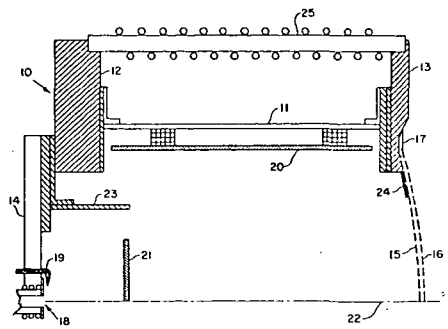
HYDROGEN HOLLOW CATHODE ION SOURCE Patent

Michael J. Mirtich, Jr., James S. Sovey, and Robert F. Roman, inventors (to NASA) Issued 19 Aug. 1980 4 p Filed 23 Oct. 1978 Supersedes N79-10894 (17 - 01, p 0118)

(NASA-Case-LEW-12940-1; US-Patent-4,218,633; US-Patent-Appl-SN-953391; US-Patent-Class-313-362; US-Patent-Class-313-231.4) Avail: US Patent and Trademark Office CSCL 20H

A source of hydrogen ions is disclosed and includes a chamber having at one end a cathode which provides electrons and through which hydrogen gas flows into the chamber. Screen and accelerator grids are provided at the other end of the chamber. A baffle plate is disposed between the cathode and the grids and a cylindrical baffle is disposed coaxially with the cathode at the one end of the chamber. The cylindrical baffle is of greater diameter than the baffle plate to provide discharge impedance and also to protect the cathode from ion flux. An anode electrode draws the electrons away from the cathode. The hollow cathode includes a tubular insert of tungsten impregnated with a low work function material to provide ample electrons. A heater is provided around the hollow cathode to initiate electron emission from the low work function material.

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



74 OPTICS

Includes light phenomena.

N80-24149* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

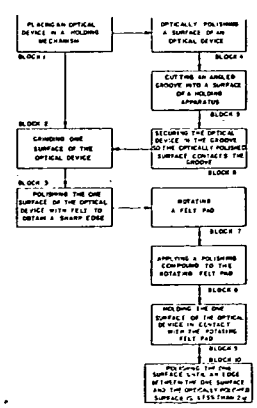
METHOD OF FORMING A SHARP EDGE ON AN OPTICAL DEVICE Patent

Charles M. Fleetwood and Stephen H. Rice Issued 22 Apr. 1980 8 p Filed 28 Jul. 1978 Supersedes N78-29902 (16 - 23, p 2729)

(NASA-Case-GSC-12348-1; US-Patent-4,198,788; US-Patent-Appl-SN-929088; US-Patent-Class-51-283R; US-Patent-Class-51-277; US-Patent-Class-65-61) Avail: US Patent and Trademark Office CSCL 20F

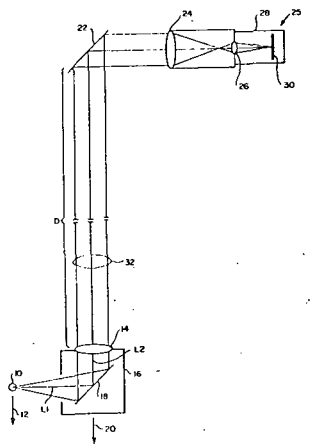
A sharp edge is formed on an optical device by placing the optical device in a holding mechanism; grinding one surface so that it and a surface of the holding mechanism are co-planar; and polishing both the surface of the optical device and the surface of the holding mechanism with felt until an edge on the surface of the optical device adjacent to the surface of the holding mechanism obtains a desired sharpness.

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



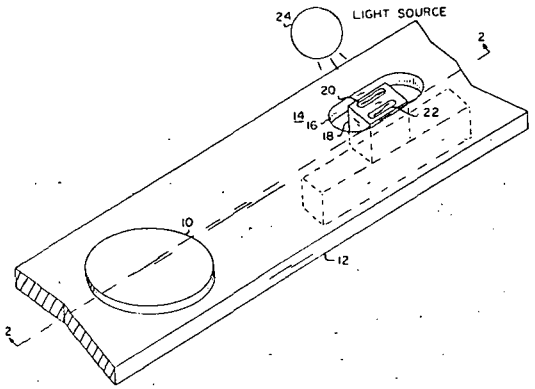
N80-24152*# National Aeronautics and Space Administration. Pasadena Office, Calif.
CONSTANT MAGNIFICATION OPTICAL TRACKING SYSTEM Patent Application
Robert E. Frazer, inventor (to NASA) (JPL) Filed 30 Apr. 1980 14 p
(Contract NAS7-100)
(NASA-Case-NPO-14813-1; US-Patent-Appl-SN-145282) Avail: NTIS HC A02/MF A01 CSCL 20F

A constant magnification optical tracking system is disclosed wherein a traveling objective lens maintains a fixed relationship to an object to be optically tracked. The objective lens is chosen to provide a collimated light beam oriented in the direction of travel of the moving object. A reflective surface is attached to the traveling objective lens for reflecting an image of the moving object to the lens. The moving object is maintained at the focal point of the traveling objective lens. A motor and control means is provided for maintaining the traveling objective lens in a fixed relationship relative to a free falling object, thereby keeping said object at the focal point and centered on the axis of the traveling objective lens throughout its entire free fall path. NASA



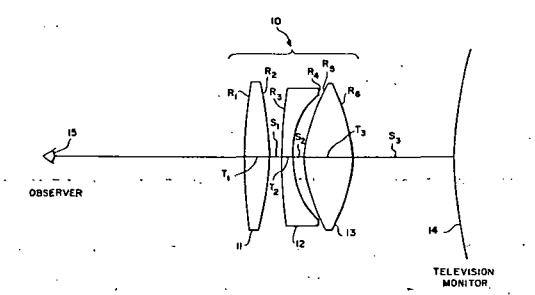
N80-25134*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PHOTOELECTRIC DETECTION SYSTEM Patent Application
James R. Currie, inventor (to NASA) Filed 30 Apr. 1980 14 p
(NASA-Case-MFS-23776-1; US-Patent-Appl-SN-145272) Avail: NTIS HC A02/MF A01 CSCL 20F

A photoelectric beam system for the detection of the arrival of an object at a discrete station wherein artificial light, natural light, or no light may be present is described. A signal generator turns a signal light on and off at a selected frequency. When the object in question arrives on station ambient light is blocked by the object and the signal light is reflected onto a photoelectric sensor having a delayed electrical output and of the same frequency as the signal light. Outputs from both the signal source and the photoelectric sensor are fed to inputs of an exclusively OR detector which provides as an output the difference between them. The difference signal is a small width pulse occurring at the frequency of the signal source. This signal is distinguished from those responsive to sunlight, darkness, or 120 Hz artificial light by filter means. In this fashion, An object presence is thereby established. NASA



N80-27185* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
CHROMATICALLY CORRECTED VIRTUAL IMAGE VISUAL DISPLAY Patent
William M. Kahlbaum, Jr., inventor (to NASA) Issued 10 Jun. 1980 4 p Filed 23 Oct. 1978
(NASA-Case-Lar-12251-1; US-Patent-4,206,970; US-Patent-Appl-SN-953389; US-Patent-Class-350-175E; US-Patent-Class-350-226) Avail: US Patent and Trademark Office CSCL 20F

An in-line, three element, large diameter, optical display lens is disclosed which has a front convex-convex element, a central convex-concave element, and a rear convex-convex element. The lens, used in flight simulators, magnifies an image presented on a television monitor and, by causing light rays leaving the lens to be in essentially parallel paths, reduces eye strain of the simulator operator.
Official Gazette of the U.S. Patent and Trademark Office

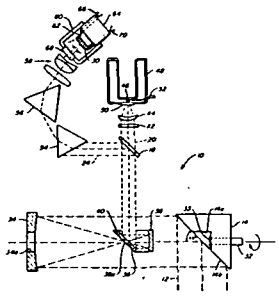


N80-33210* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
MULTISPECTRAL SCANNER OPTICAL SYSTEM Patent
Roy C. Stokes (Lockheed Electronics Co., Houston, Tex.) and Norman G. Koch, inventors (to NASA) (Lockheed Electronics Co., Houston, Tex.) Issued 29 Jul. 1980 8 p Filed 29 Mar. 1979 Supersedes N79-22880 (17 - 13, p 1775) Sponsored by NASA
(NASA-Case-MSC-18255-1; US-Patent-4,215,273; US-Patent-Appl-SN-025163; US-Patent-Class-250-347; US-Patent-Class-250-352; US-Patent-Class-250-353; US-Patent-Class-350-55; US-Patent-Class-356-72) Avail: US Patent and Trademark Office CSCL 20F

An optical system for use in a multispectral scanner of the type used in video imaging devices is disclosed. Electromagnetic

radiation reflected by a rotating scan mirror is focused by a concave primary telescope mirror and collimated by a second concave mirror. The collimated beam is split by a dichroic filter which transmits radiant energy in the infrared spectrum and reflects visible and near infrared energy. The long wavelength beam is filtered and focused on an infrared detector positioned in a cryogenic environment. The short wavelength beam is dispersed by a pair of prisms, then projected on an array of detectors also mounted in a cryogenic environment and oriented at an angle relative to the optical path of the dispersed short wavelength beam.

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



N80-34250*# National Aeronautics and Space Administration. Pasadena Office, Calif.

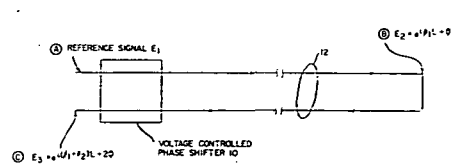
A FIBER OPTIC TRANSMISSION LINE STABILIZATION APPARATUS AND METHOD Patent Application

George F. Lutes (JPL) and Kam Y. Lau, inventors (to NASA) (JPL) Filed 17 Sep. 1980 31 p

(Contract NAS7-100)

(NASA-Case-NPO-15036-1; US-Patent-Appl-SN-188160) Avail: NTIS HC A03/MF A01 CSCL 20F

A reference signal of RF frequency modulates .85 micrometer wavelength optical transmitter whose output passes through an optical filter and a voltage controller phase shifter such that the output of the phase shifter is provided to the fiber optic transmission line. At the receiving end of the fiber optic transmission line, the signal is demodulated and used to modulate a 1.06 micrometer optical transmitter. The output signal from the 1.06 micrometer optical transmitter is provided to the same fiber optic transmission line and passes through the voltage controlled phase shifter to a phase error detector. The phase of the modulation of the 1.06 micrometer wavelength signal is compared to the phase of the reference signal by the phase error detector which provides a phase control signal related to the phase difference. This control signal is provided to the voltage controlled phase shifter which alters the phase of both optical signals passing through until a predetermined phase relationship between modulation on the 1.06 micrometer signal and the reference signal is obtained. NASA



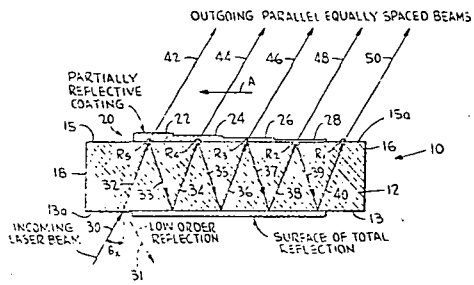
N80-34251*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

COLLIMATED BEAM MANIFOLD AND METHOD FOR USING THE SAME Patent Application

C. Warren Campbell and Robert B. Owen, inventors (to NASA) Filed 15 Sep. 1980 15 p

(NASA-Case-MFS-25312-1; US-Patent-Appl-SN-187106) Avail: NTIS HC A02/MF A01 CSCL 20F

An optical manifold transforms a collimated beam, such as a laser beam, into a number of parallel beams having uniform intensity or having a desired intensity ratio. The manifold comprises an optical substrate coated on its rear surface with a fully reflective layer and on its front surface with a partially reflecting layer with a reflectivity gradient. An input collimated beam entering the rear surface and impinging on the front surface is multiplicatively reflected between the front and rear surfaces producing a number of parallel beams that emerge from the front surface. The intensities of the emerging beams have a relationship that depends on the reflectivity (R1, R2, R3, R4, and R5) of the front surface at the points where the beams emerge. By properly selecting the reflectivity gradients, the emerging beams will have uniform intensity or a desired intensity ratio. NASA



76 SOLID-STATE PHYSICS

Includes superconductivity.

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

N80-32244* National Aeronautics and Space Administration. Pasadena Office, Calif.

MEANS FOR GROWING RIBBON CRYSTALS WITHOUT SUBJECTING THE CRYSTALS TO THERMAL SHOCK-INDUCED STRAINS Patent

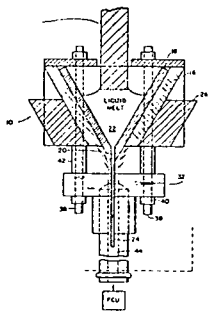
Samuel Berkman (RCA, Princeton, N.J.), Kyong-Min Kim (RCA, Princeton, N.J.), and Harold E. Temple, inventors (to NASA) (RCA, Princeton, N.J.) Issued 5 Aug. 1980 5 p Filed 31 Aug. 1978 Supersedes N79-10917 (17 - 01, p 0121) Sponsored by NASA

(NASA-Case-NPO-14298-1; US-Patent-4,216,186; US-Patent-Appl-SN-938579; US-Patent-Class-156-DIG.96) Avail: US Patent and Trademark Office CSCL 20B

A susceptor particularly suited for use in growing a ribbon crystal employing edge defined film fed growth techniques is described. The susceptor includes a die through which a melt is drawn for forming a crystal ribbon. This is combined with a coolant delivery system characterized by a pair of jets for directing a stream of fluid coolant along a path extended to impinge on

the susceptor in close proximity with the die in nonincident relation with the crystal being grown.

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



N80-32245* National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD OF GROWING A RIBBON CRYSTAL PARTICULARLY SUITED FOR FACILITATING AUTOMATED CONTROL OF RIBBON WIDTH Patent

Theodore F. Ciszek, inventor (to NASA) (IBM, Poughkeepsie, N.Y.) Issued 12 Aug. 1980 8 p Filed 28 Apr. 1978 Supersedes N78-24952 (17 - 15, p 2056) Sponsored by NASA (NASA-Case-NPO-14295-1; US-Patent-4,217,165; US-Patent-Appl-SN-901055; US-Patent-Class-156-601; US-Patent-Class-156-617SP; US-Patent-Class-156-DIG.64; US-Patent-Class-156-DIG.88) Avail: US Patent and Trademark Office CSCL 20B

A method of growing a ribbon crystal is described wherein a meniscus of molten semiconductor material attached to vertical movable seed is lifted at a rate substantially equal to the rate at which the meniscus freezes. The method is characterized by the steps of continuously sensing the brightness of the growth region of the ribbon in selected areas across the ribbon width for detecting changes in the intensity of the brightness of the selected areas, and modifying the temperature of the meniscus and pulling speed in response to changes detected in the intensity for controlling the geometry of the ribbon.

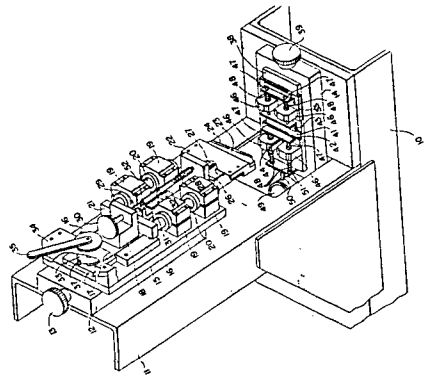
Official Gazette of the U.S. Patent and Trademark Office

N80-32246*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

CRYSTAL CLEAVING MACHINE Patent Application

John S. J. Benedicto and Frederick C. Hallberg, inventors (to NASA) Filed 29 Aug. 1980 19 p (NASA-Case-GSC-12584-1; US-Patent-Appl-SN-182879) Avail: NTIS HC A02/MF A01 CSCL 20B

A machine is disclosed for cleaving hard crystals with precision and uniformity. It includes a vertical axis positioning control means for an adjustable spring tension guided hammer mechanism employed to strike an anvil and thereby generate a crystal cleaving shock wave transmitted to a cleaving blade. An underlying crystal holding fixture with horizontal position control means includes a zero reference stop face for the crystal and opposing spring loaded clamping and vertical positioning elements which are precisely guided. The crystal is restrained only to the extent that it remains in an ideal position for cleaving until the shock wave begins to propagate along a cleavage plane. Thus the shock wave forces that separate the crystal are balanced and the light restraining force used to hold the crystal allows it to splay apart with minimal shock wave damping. NASA



85 URBAN TECHNOLOGY AND TRANSPORTATION

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

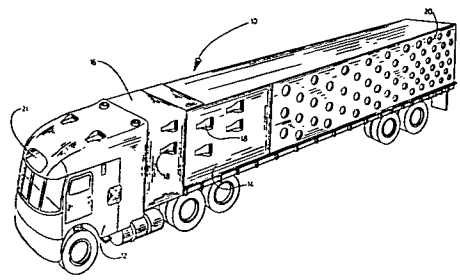
For related information see *03 Air Transportation and Safety, 16 Space Transportation,* and *44 Energy Production and Conversion.*

N80-33312*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

IMPROVED LOW-DRAG GROUND VEHICLE PARTICULARLY SUITED FOR USE IN SAFELY TRANSPORTING LIVESTOCK Patent Application

Edwin J. Saltzman, inventor (to NASA) Filed 5 Aug. 1980 15 p (NASA-Case-FRC-11058-1; US-Patent-Appl-SN-175453) Avail: NTIS HC A02/MF A01 CSCL 13F

A low drag truck consisting of a tractor trailer rig characterized by a rounded forebody and a protective fairing for the gap conventionally found to exist between the tractor and the trailer is described. The truck is particularly suited for establishing an attached flow of ambient air along the vehicle surfaces by utilizing a forward facing, ram air inlet and duct and a plurality of submerged inlets and outflow ports which communicate with the trailer for continuously flushing heated gasses from the trailer as the rig is propelled at highway speeds. NASA



1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA SP-7039(18)		

4. Title and Subtitle	5. Report Date
NASA PATENT ABSTRACTS BIBLIOGRAPHY A Continuing Bibliography (Supplement 18)	January 1981
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
	10. Work Unit No.
9. Performing Organization Name and Address National Aeronautics and Space Administration Washington, D.C. 20546	11. Contract or Grant No.
	13. Type of Report and Period Covered
12. Sponsoring Agency Name and Address	14. Sponsoring Agency Code

15. Supplementary Notes

Section 1: Abstracts

16. Abstract

This bibliography is issued in two sections: Section 1 - Abstracts, and Section 2 - Indexes. This issue of the Abstract Section cites 120 patents and applications for patent introduced into the NASA scientific and technical information system during the period of July 1980 through December 1980. Each entry of the Abstract Section consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or application for patent.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Bibliographies Inventions NASA Programs Patents	Unclassified - Unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	726	$8.50 HC

*For sale by the National Technical Information Service, Springfield, Virginia 22161

NASA-Langley, 1981

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

NASA distributes its technical documents and bibliographic tools to eleven special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

CALIFORNIA
University of California, Berkeley

COLORADO
University of Colorado, Boulder

DISTRICT OF COLUMBIA
Library of Congress

GEORGIA
Georgia Institute of Technology, Atlanta

ILLINOIS
The John Crerar Library, Chicago

MASSACHUSETTS
Massachusetts Institute of Technology, Cambridge

MISSOURI
Linda Hall Library, Kansas City

NEW YORK
Columbia University, New York

OKLAHOMA
University of Oklahoma, Bizzell Library

PENNSYLVANIA
Carnegie Library of Pittsburgh

WASHINGTON
University of Washington, Seattle

NASA publications (those indicated by an "*" following the accession number) are also received by the following public and free libraries:

CALIFORNIA
Los Angeles Public Library
San Diego Public Library

COLORADO
Denver Public Library

CONNECTICUT
Hartford Public Library

MARYLAND
Enoch Pratt Free Library, Baltimore

MASSACHUSETTS
Boston Public Library

MICHIGAN
Detroit Public Library

MINNESOTA
Minneapolis Public Library

MISSOURI
Kansas City Public Library
St. Louis Public Library

NEW JERSEY
Trenton Public Library

NEW YORK
Brooklyn Public Library
Buffalo and Erie County Public Library
Rochester Public Library
New York Public Library

OHIO
Akron Public Library
Cincinnati Public Library
Cleveland Public Library
Dayton Public Library
Toledo Public Library

TENNESSEE
Memphis Public Library

TEXAS
Dallas Public Library
Fort Worth Public Library

WASHINGTON
Seattle Public Library

WISCONSIN
Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019.

EUROPEAN

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

NASA CONTINUING BIBLIOGRAPHY SERIES

NUMBER	TITLE	FREQUENCY
NASA SP–7011	AEROSPACE MEDICINE AND BIOLOGY Aviation medicine, space medicine, and space biology	Monthly
NASA SP–7037	AERONAUTICAL ENGINEERING Engineering, design, and operation of aircraft and aircraft components	Monthly
NASA SP–7039	NASA PATENT ABSTRACTS BIBLIOGRAPHY NASA patents and applications for patent	Semiannually
NASA SP–7041	EARTH RESOURCES Remote sensing of earth resources by aircraft and spacecraft	Quarterly
NASA SP–7043	ENERGY Energy sources, solar energy, energy conversion, transport, and storage	Quarterly
NASA SP–7500	MANAGEMENT Program, contract, and personnel management, and management techniques	Annually

Details on the availability of these publications may be obtained from:

SCIENTIFIC AND TECHNICAL INFORMATION OFFICE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C. 20546

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

NASA distributes its technical documents and bibliographic tools to eleven special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

CALIFORNIA
University of California, Berkeley

COLORADO
University of Colorado, Boulder

DISTRICT OF COLUMBIA
Library of Congress

GEORGIA
Georgia Institute of Technology, Atlanta

ILLINOIS
The John Crerar Library, Chicago

MASSACHUSETTS
Massachusetts Institute of Technology, Cambridge

MISSOURI
Linda Hall Library, Kansas City

NEW YORK
Columbia University, New York

OKLAHOMA
University of Oklahoma, Bizzell Library

PENNSYLVANIA
Carnegie Library of Pittsburgh

WASHINGTON
University of Washington, Seattle

NASA publications (those indicated by an "*" following the accession number) are also received by the following public and free libraries:

CALIFORNIA
Los Angeles Public Library
San Diego Public Library

COLORADO
Denver Public Library

CONNECTICUT
Hartford Public Library

MARYLAND
Enoch Pratt Free Library, Baltimore

MASSACHUSETTS
Boston Public Library

MICHIGAN
Detroit Public Library

MINNESOTA
Minneapolis Public Library

MISSOURI
Kansas City Public Library
St. Louis Public Library

NEW JERSEY
Trenton Public Library

NEW YORK
Brooklyn Public Library
Buffalo and Erie County Public Library
Rochester Public Library
New York Public Library

OHIO
Akron Public Library
Cincinnati Public Library
Cleveland Public Library
Dayton Public Library
Toledo Public Library

TENNESSEE
Memphis Public Library

TEXAS
Dallas Public Library
Fort Worth Public Library

WASHINGTON
Seattle Public Library

WISCONSIN
Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019.

EUROPEAN

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