



NASA PATENT ABSTRACTS BIBLIOGRAPHY

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Section 1 • Abstracts

JULY 1979

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA SP-7039(15) NASA Patent Abstracts Bibliography (Sect. 1 • Abstracts) JULY 1979

ACCESSION NUMBER RANGES

<i>Bibliography Number</i>	<i>STAR Accession Numbers</i>
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

PATENT
ABSTRACTS
BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

Annotated references to NASA-owned inventions covered by U S patents and applications for patent that were announced in *Scientific and Technical Aerospace Reports (STAR)* between January 1979 and June 1979



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INTRODUCTION

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

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

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

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

The 240 citations published in this issue of the Abstract Section cover the period January 1979 through June 1979. The Index Section contains references to the 3632 citations covering the period May 1969 through June 1979.

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:

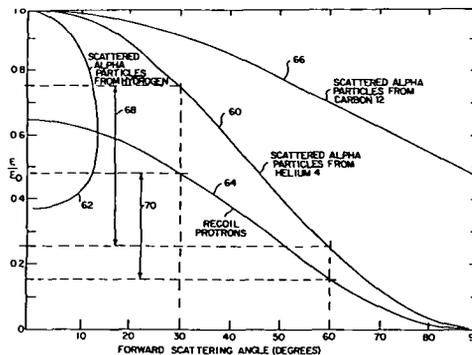
NASA Accession Number
NASA Case Number
Inventor's Name

- 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

<p>NASA SPONSORED DOCUMENT</p> <p>NASA ACCESSION NUMBER</p> <p>TITLE</p> <p>INVENTOR</p> <p>NASA CASE NUMBER</p> <p>ABSTRACT</p>	<p>N79-12416* National Aeronautics and Space Administration Pasadena Office Calif</p> <p>METHOD AND MEANS FOR HELIUM/HYDROGEN RATIO MEASUREMENT BY ALPHA SCATTERING Patent Application</p> <p>A Bruce Whitehead (JPL) and Thomas A Trombrello inventors (to NASA) (JPL) Filed 7 Nov 1978 18 p (Contract NAS7-100)</p> <p>(NASA-Case-NPO-14079-1 US-Patent-Appl-SN-958573) Avail NTIS HC A02/MF A01 CSCL 14B</p> <p>A cylindrically shaped enclosure has a source of alpha particles at one end and detectors mounted in tandem at the other end. Two downward-extending baffles and a blocking shield define a forward-scattering angular range in which scattering products from alpha particle/hydrogen and alpha particle/helium collisions can reach the detector's surface. The thickness of the detectors is sized so that alpha particles resulting from alpha particle/helium collisions are absorbed in the first detector and recoil protons resulting from alpha particles/hydrogen collisions pass through the first detector and are absorbed by the second detector. Each scattering product is identified from its ability to penetrate or not penetrate a detection material of predetermined thickness. The output pulses are processed by an electronic processing system. The apparatus could be carried by a planetary probe to one of the outer planets.</p> <p style="text-align: right;">NASA</p>	<p>AVAILABLE ON MICROFICHE</p> <p>SOURCE</p> <p>US PATENT APPLICATIONS SERIAL NUMBER</p> <p>AVAILABILITY</p> <p>COSATI CODE</p>
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KEY ILLUSTRATION

INDEX SECTION (SECTION 2)

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

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

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

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

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

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

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

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

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

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

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

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

PUBLIC AVAILABILITY OF COPIES OF PATENTS AND PATENT APPLICATIONS

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

NASA *patent application specifications* are sold in paper copy by the National Technical Information Service at price code A02 (\$4 00 domestic, \$8 00 foreign) Microfiche are sold at price code A01 (\$3 00 domestic, \$4 50 foreign) The US-Patent-Appl-SN-number should be used in ordering either paper copy or microfiche from NTIS

LICENSES FOR COMMERCIAL USE INQUIRIES AND APPLICATIONS FOR LICENSE

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

Inquiries concerning the NASA Patent Licensing Program or the availability of licenses for the commercial use of NASA-owned inventions covered by U S patents or pending applications for patent should be forwarded to the NASA Patent Counsel of the NASA installation having cognizance of the specific invention, or the Assistant General Counsel for Patent Matters, Code GP-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

PATENT LICENSING REGULATIONS

Title 14—AERONAUTICS AND SPACE

Chapter V—National Aeronautics and Space Administration

PART 1245—PATENTS

Subpart 2—Patent Licensing Regulations

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

Sec.	
1245.200	Scope of subpart.
1245.201	Definitions.
1245.202	Basic considerations.
1245.203	Licenses for practical application of inventions.
1245.204	Other licenses.
1245.205	Publication of NASA inventions available for license.
1245.206	Application for nonexclusive license.
1245.207	Application for exclusive license.
1245.208	Processing applications for license.
1245.209	Royalties and fees.
1245.210	Reports
1245.211	Revocation of licenses.
1245.212	Appeals
1245.213	Litigation.
1245.214	Address of communications.

AUTHORITY The provisions of this Subpart 2 issued under 42 USC 2457, 2473(b) (3).

§ 1245.200 Scope of subpart.

This Subpart 2 prescribes the terms, conditions, and procedures for licensing inventions covered by US 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 USC 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 USC 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 non-exclusive 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 licenses 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

PATENT LICENSING REGULATIONS

§ 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 USC 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 periodically 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 US citizen or a US 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-

PATENT LICENSING REGULATIONS

cence 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 US 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 US 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-

PATENT LICENSING REGULATIONS

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

AERONAUTICS

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

For related information see also *Aeronautics*

01 AERONAUTICS (GENERAL) N.A.

02 AERODYNAMICS 1

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*

03 AIR TRANSPORTATION AND SAFETY N.A.

Includes passenger and cargo air transport operations, and aircraft accidents

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

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION 2

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*

05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE 2

Includes aircraft simulation technology

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

06 AIRCRAFT INSTRUMENTATION N.A.

Includes cockpit and cabin display devices, and flight instruments

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

07 AIRCRAFT PROPULSION AND POWER 3

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*

08 AIRCRAFT STABILITY AND CONTROL 4

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

09 RESEARCH AND SUPPORT FACILITIES (AIR) 5

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)*

ASTRONAUTICS

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

For related information see also *Aeronautics*

12 ASTRONAUTICS (GENERAL) N.A.

For extraterrestrial exploration see *91 Lunar and Planetary Exploration*

13 ASTRODYNAMICS N.A.

Includes powered and free-flight trajectories, and orbit and launching dynamics

14 GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE) N.A.

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

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

15 LAUNCH VEHICLES AND SPACE VEHICLES N.A.

Includes boosters, manned orbital laboratories, reusable vehicles, and space stations

16 SPACE TRANSPORTATION N.A.

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

For related information see also *03 Air Transportation and Safety* and *85 Urban Technology and Transportation*

17 SPACECRAFT COMMUNICATIONS, COMMAND AND TRACKING N.A.

Includes telemetry, space communications networks, astronavigation, and radio blackout

For related information see also *04 Aircraft Communications and Navigation* and *32 Communications*

18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE 6

Includes spacecraft thermal and environmental control, and attitude control

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

19 SPACECRAFT INSTRUMENTATION N.A.

For related information see also *06 Aircraft Instrumentation* and *35 Instrumentation and Photography*

20 SPACECRAFT PROPULSION AND POWER 7

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

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

CHEMISTRY AND MATERIALS

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

23 CHEMISTRY AND MATERIALS (GENERAL) N.A.

Includes biochemistry and organic chemistry

24 COMPOSITE MATERIALS 9

Includes laminates

25 INORGANIC AND PHYSICAL CHEMISTRY 10

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

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

26 METALLIC MATERIALS 12

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

27 NONMETALLIC MATERIALS 13

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

28 PROPELLANTS AND FUELS 15

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*

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*

31 ENGINEERING (GENERAL) 16

Includes vacuum technology, control engineering, display engineering, and cryogenics

32 COMMUNICATIONS 20

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*

33 ELECTRONICS AND ELECTRICAL ENGINEERING 27

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*

34 FLUID MECHANICS AND HEAT TRANSFER 33

Includes boundary layers, hydrodynamics, fluidics, mass transfer, and ablation cooling

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

35 INSTRUMENTATION AND PHOTOGRAPHY 35

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*

36 LASERS AND MASERS 40

Includes parametric amplifiers

37 MECHANICAL ENGINEERING 41

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

38 QUALITY ASSURANCE AND RELIABILITY 48

Includes product sampling procedures and techniques, and quality control

39 STRUCTURAL MECHANICS N.A.

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*

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*

42 GEOSCIENCES (GENERAL) N.A.

43 EARTH RESOURCES 48
 Includes remote sensing of earth resources by aircraft and spacecraft, photogrammetry, and aerial photography
 For instrumentation see *35 Instrumentation and Photography*

44 ENERGY PRODUCTION AND CONVERSION 49
 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*

45 ENVIRONMENT POLLUTION 55
 Includes air, noise, thermal and water pollution, environment monitoring, and contamination control

46 GEOPHYSICS 56
 Includes aeronomy, upper and lower atmosphere studies, ionospheric and magnetospheric physics, and geomagnetism
 For space radiation see *93 Space Radiation*

47 METEOROLOGY AND CLIMATOLOGY N.A.
 Includes weather forecasting and modification

48 OCEANOGRAPHY 57
 Includes biological, dynamic and physical oceanography, and marine resources

LIFE SCIENCES

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

51 LIFE SCIENCES (GENERAL) 57
 Includes genetics

52 AEROSPACE MEDICINE 58
 Includes physiological factors, biological effects of radiation, and weightlessness

53 BEHAVIORAL SCIENCES N.A.
 Includes psychological factors, individual and group behavior, crew training and evaluation, and psychiatric research

54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT 62
 Includes human engineering, biotechnology, and space suits and protective clothing

55 PLANETARY BIOLOGY N.A.
 Includes exobiology, and extraterrestrial life

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

59 MATHEMATICAL AND COMPUTER SCIENCES (GENERAL) N.A.

60 COMPUTER OPERATIONS AND HARDWARE 63
 Includes computer graphics and data processing
 For components see *33 Electronics and Electrical Engineering*

61 COMPUTER PROGRAMMING AND SOFTWARE N.A.
 Includes computer programs, routines, and algorithms

62 COMPUTER SYSTEMS N.A.
 Includes computer networks

63 CYBERNETICS N.A.
 Includes feedback and control theory
 For related information see also *54 Man/System Technology and Life Support*

64 NUMERICAL ANALYSIS N.A.
 Includes iteration, difference equations, and numerical approximation

65 STATISTICS AND PROBABILITY N.A.
 Includes data sampling and smoothing, Monte Carlo method, and stochastic processes

66 SYSTEMS ANALYSIS N.A.
 Includes mathematical modeling, network analysis, and operations research

67 THEORETICAL MATHEMATICS N.A.
 Includes topology and number theory

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*

70 PHYSICS (GENERAL) N.A.
 For geophysics see *46 Geophysics* For astrophysics see *90 Astrophysics* For solar physics see *92 Solar Physics*

71 ACOUSTICS 63
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For noise pollution see *45 Environment Pollution*

72 ATOMIC AND MOLECULAR PHYSICS 64
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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 64
Includes light phenomena

75 PLASMA PHYSICS 67
Includes magnetohydrodynamics and plasma fusion
For ionospheric plasmas see *46 Geophysics* For space plasmas see *90 Astrophysics*

76 SOLID-STATE PHYSICS 68
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 70
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 70
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 70

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

Section 2 • Indexes

SUBJECT INDEX
INVENTOR INDEX
SOURCE INDEX
NUMBER INDEX
ACCESSION NUMBER INDEX



JULY 1979 (Supplement 15)

NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

02 AERODYNAMICS

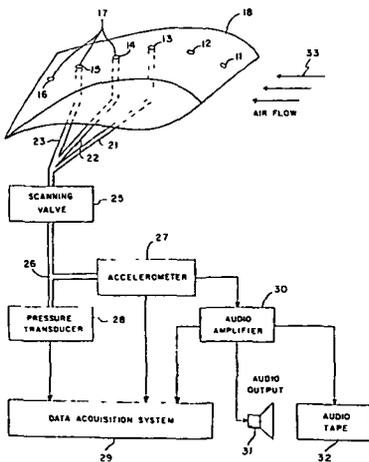
Includes aerodynamics of bodies, combinations wings, rotors, and control surfaces and internal flow in ducts and turbomachinery

For related information see also 34 Fluid Mechanics and Heat Transfer

N79-16805*# National Aeronautics and Space Administration Langley Research Center Hampton Va
DETECTION OF THE TRANSITIONAL LAYER BETWEEN LAMINAR AND TURBULENT FLOW AREAS ON A WING SURFACE Patent Application

William R Hood, inventor (to NASA) Filed 27 Nov 1978 7 p
 (NASA-Case-LAR-12261-1, US-Patent-Appl-SN-964009) Avail NTIS HC A02/MF A01 CSCL 01A

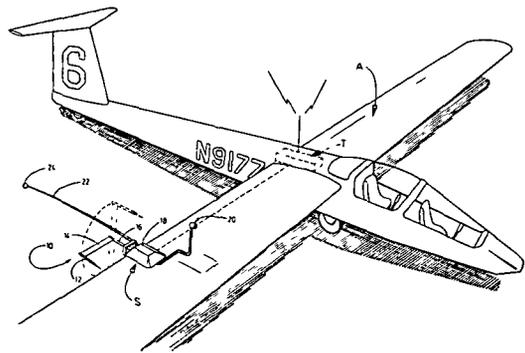
Airflow is passed over a wing surface. A scanning valve is adjusted so that a pneumatic tube extending from an orifice is connected via a pneumatic tube to an accelerometer and to a pressure transducer. As air passes over the orifice the pressure and noise levels are measured by the two instruments and recorded by a data acquisition system. The noise may also be heard via audio output and recorded by audio tape. The scanning valve is then adjusted so that the pneumatic tube extending from the orifice is connected via the pneumatic tube to the pressure transducer and to the accelerometer. The pressure and noise measurements are taken for the orifice. In the same manner the scanning valve subsequently connects each of the remaining orifices one at a time to the measuring and recording apparatus. The laminar to turbulent boundary is determined easily by visual inspection of the resulting graph. The need for an operator to be in the wind tunnel is eliminated and pressure measurements made simultaneously with the noise level measurements. NASA



N79-17797*# National Aeronautics and Space Administration Hugh L Dryden Flight Research Center Edwards Calif
AN IMPROVED SYSTEM FOR USE IN CONDUCTING WAKE INVESTIGATION FOR A WING IN FLIGHT Patent Application

Lawrence C Montoya and Paul F Bikle inventors (to NASA) Filed 28 Feb 1979 19 p
 (NASA-Case-FRC-11024-1 US-Patent-Appl-SN-015983) Avail NTIS HC A02/MF A01 CSCL 01A

A pressure measuring system is described for use in obtaining in-flight wing profile drag measurements for low values of dynamic pressure and Reynolds number. The system is supported by a wing in flight which has a total pressure head arranged in spaced relation with a wake (as the wake is generated by the wing) and a reference static pressure head adapted to be displayed along an accurate path through the wake. A total pressure port and a static pressure port are included. A differential transducer is connected to the heads through a pressure switching device provided to selectively connect the heads to the transducer in opposed relation. Thus a single differential transducer is adapted to be utilized in obtaining differential pressure measurements for the wake. NASA



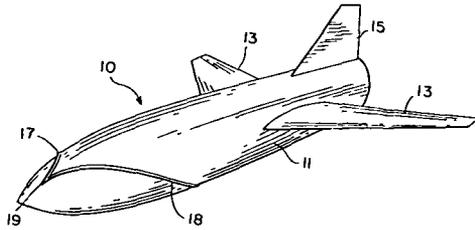
N79-17813*# National Aeronautics and Space Administration Langley Research Center Hampton Va
AERODYNAMIC SIDE-FORCE ALLEVIATOR MEANS Patent Application

Dhanvada M Rao inventor (to NASA) (Old Dominion Univ Norfolk Va) Filed 12 Mar 1979 14 p Sponsored by NASA (NASA-Case-LAR-12326-1 US-Patent-Appl-SN-019541) Avail NTIS HC A02/MF A01 CSCL 01A

An apparatus is presented for alleviating high angle-of-attack side force on slender pointed cylindrical forebodies such as fighter aircraft missiles and the like employing a symmetrical pair of helical separation trips to disrupt the leeside vortices normally attained. The novelty of the invention appears to reside in the use of a pair of symmetrical separation trips to force boundary layer separation and thereby disrupt the leeside vortices normally attained on slender pointed cylindrical forebodies such as fighter

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION

aircraft and missiles to thereby alleviate high angle of attack side forces and yawing moments
NASA



04 AIRCRAFT COMMUNICATIONS AND NAVIGATION

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

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

N79-10039* National Aeronautics and Space Administration
Pasadena Office Calif

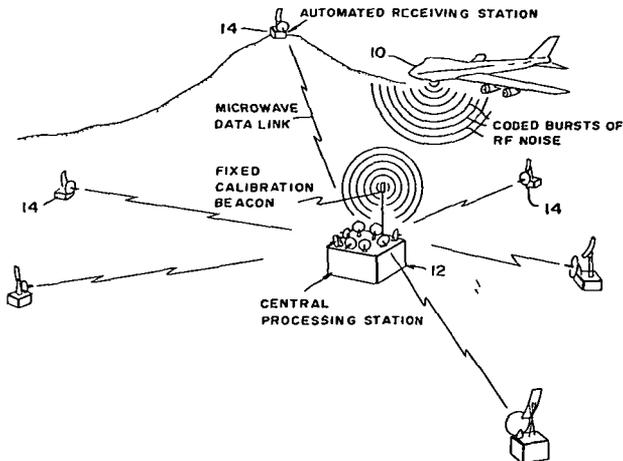
INTERFEROMETRIC LOCATING SYSTEM Patent Application

Peter F MacDoran inventor (to NASA) (JPL) Filed 31 Aug 1978 23 p

(Contract NAS7-100)

(NASA-Case-NPO-14173-1 US-Patent-Appl-SN-938581) Avail NTIS HC A02/MF A01 CSCL 17G

An object of the invention is to provide a system for locating aircraft or other targets by a group of land-based radio receivers. One system detects broadband noise emitted from the target to detect even hostile aircraft. Another system utilizes narrow band bursts emitted from low cost transmitters in aircraft to detect a large number of aircraft in an area while requiring a limited frequency band
NASA



05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE

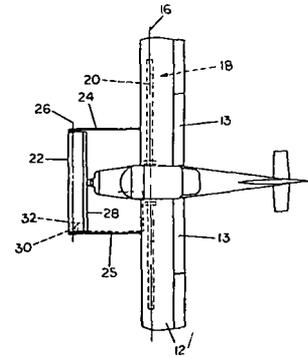
Includes aircraft simulation technology
For related information see also 18 *Spacecraft Design, Testing and Performance* and 39 *Structural Mechanics*

N79-12061* National Aeronautics and Space Administration
Hugh L Dryden Flight Research Center Edwards Calif
FREE WING ASSEMBLY FOR AN AIRCRAFT Patent
Chester H Wolowicz inventor (to NASA) Issued 7 Nov 1978
9 p Filed 8 Sep 1977 Supersedes N77-31135 (15 - 22 p 2894)

(NASA-Case-FRC-10092-1 US-Patent-4 124 180
US-Patent-Appl-SN-831634 US-Patent-Class-244-82
US-Patent-Class-244-48 US-Patent-Class-244-90R) Avail US Patent and Trademark Office CSCL 01C

A free wing is attached to a fuselage of an aircraft in a manner such that the wing is free to pivot about a spanwise axis forward of its aerodynamic center. The wing is angularly displaced about the axis by aerodynamic pitching moments, resulting from lift and is trimmed through a use of a trimmable free stabilizer comprising a floating canard mounted on a strut rigidly connected to the wing and projected forward from it

Official Gazette of the U S Patent and Trademark Office



N79-17847* National Aeronautics and Space Administration
Ames Research Center Moffett Field Calif

CONSTANT LIFE ROTOR FOR A HEAVIER THAN AIR CRAFT Patent

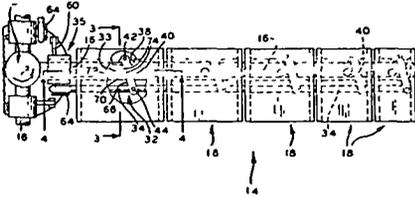
Robert H Stroub inventor (to NASA) Issued 30 Jan 1979
8 p Filed 25 Jul 1977 Supersedes N77-28111 (15 - 19 p 2486)

(NASA-Case-ARC-11045-1 US-Patent-4 137 010
US-Patent-Appl-SN-818916 US-Patent-Class-416-51
US-Patent-Class-416-88 US-Patent-Class-416-89
US-Patent-Class-416-132R US-Patent-Class-416-138) Avail US Patent and Trademark Office CSCL 01C

A rotor blade extended radially from a hub characterized by an elongated spar and a plurality of axially aligned shells pivotally mounted on the spar is presented. Each has an aerodynamic center located in trailing relation with the spar and

supported thereby for simultaneous axial and angular displacement as centrifugal forces are applied a pitch controller plus a plurality of pivotal pitch limiting arms transversely related to the spar. A push-pull link interconnecting the arms is used for imparting simultaneous pivotal motion whereby the angular relationship of the arms to the spar is varied for varying the motion of the trucks along the arms for thus limiting the pitch of the segments about the spar.

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*

N79-10057* National Aeronautics and Space Administration Lewis Research Center Cleveland, Ohio

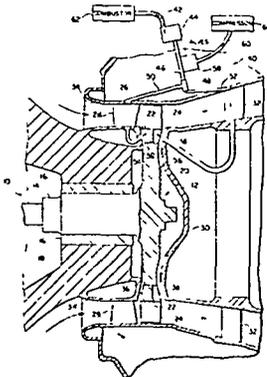
APPARATUS AND METHOD FOR REDUCING THERMAL STRESS IN A TURBINE ROTOR Patent

Jack A Heller inventor (to NASA) Issued 3 Oct 1978 6 p Filed 4 Mar 1977 Supersedes N77-18160 (15 - 09 p 1135) (NASA-Case-LEW-12232-1 US-Patent-4 117 669

US-Patent-Appl-SN-776029 US-Patent-Class-60-39 14 US-Patent-Class-415-115 US-Patent-Class-415-116) Avail US Patent Office CSCL 21E

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

Official Gazette of the U S Patent Office



N79-14095* National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

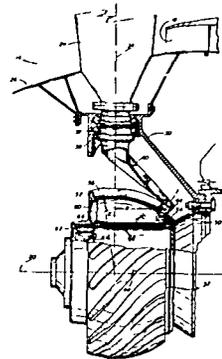
CAM-OPERATED PITCH-CHANGE APPARATUS Patent

Philip E Barnes inventor (to NASA) (United Technologies Corp., Windsor Locks Conn) Issued 7 Nov 1978 8 p Filed 9 Oct 1974 Published under the second Trial Voluntary Protest Program as B 513, 346, 9 Mar 1976 Sponsored by NASA (NASA-Case-LEW-13050-1, US-Patent-4,124 330

US-Patent-Appl-SN-513346, US-Patent-Class-416-157B US-Patent-Class-416-162, US-Patent-Class-416-160, US-Patent-Class-416-167) Avail US Patent and Trademark Office CSCL 01C

A pitch-change apparatus for a ducted thrust fan having a plurality of variable pitch blades employs a camming ring mounted coaxially at the hub at an axially fixed station along the hub axis for rotation about the hub axis both with the blades and relative to the blades. The ring has a generally spherical outer periphery and a plurality of helical camming grooves extending in a generally spherical plane on the periphery. Each of the variable pitch blades is connected to a pitch-change horn having a cam follower mounted on its outer end and the camming ring and the horns are so arranged about the hub axis that the plurality of followers on the horns engage respectively the plurality of helical camming grooves. Rotary drive means rotates the camming ring relative to the blades to cause blade pitch to be changed through the cooperative operation of the camming grooves on the ring and the cam followers on the pitch-change horns.

Official Gazette of the U S Patent and Trademark Office



N79-14096* National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

INTEGRATED GAS TURBINE ENGINE-NACELLE Patent

Arthur P Adamson (GE Cincinnati), Donald F Sargisson (GE, Cincinnati), and Charles L Stotler, Jr inventors (to NASA) (GE Cincinnati) Issued 2 Jan 1979 9 p Filed 22 Dec 1976

Continuation of abandoned US Patent Appl SN-522108 filed 8 Nov 1974 Sponsored by NASA (NASA-Case-LEW-12389-3 US-Patent-4,132 069

US-Patent-Appl-SN-753452 US-Patent-Class-60-226R US-Patent-Class-60-226A, US-Patent-Class-60-39 31 US-Patent-Class-244-54 US-Patent-Class-137-15 1

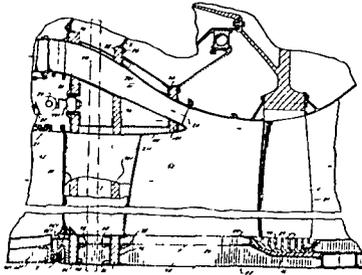
US-Patent-Class-415-201, US-Patent-Class-415-200 US-Patent-Appl-SN-552108) Avail US Patent and Trademark Office CSCL 21E.

A nacelle for use with a gas turbine engine is provided with an integral webbed structure resembling a spoked wheel for rigidly interconnecting the nacelle and engine. The nacelle is entirely supported in its spacial relationship with the engine by means of the webbed structure. The inner surface of the nacelle defines the outer limits of the engine motive fluid flow annulus.

07 AIRCRAFT PROPULSION AND POWER

while the outer surface of the nacelle defines a streamlined envelope for the engine

Official Gazette of the U S Patent and Trademark Office



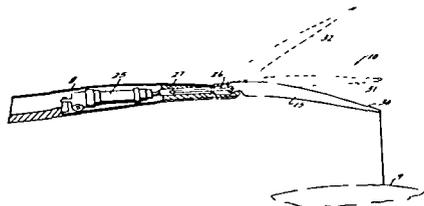
N79-14097* National Aeronautics and Space Administration
Lewis Research Center Cleveland Ohio

VARIABLE AREA EXHAUST NOZZLE Patent

Everett A Johnston inventor (to NASA) (GE Cincinnati) Issued
2 Jan 1979 8 p Filed 30 Apr 1975 Sponsored by NASA
(NASA-Case-LEW-12378-1. US-Patent-4,132 068
US-Patent-Appl-SN-573029 US-Patent-Class-60-226A
US-Patent-Class-239-265 39) Avail US Patent and Trademark
Office CSCL 21E

An exhaust nozzle for a gas turbine engine comprises a number of arcuate flaps pivotally connected to the trailing edge of a cylindrical casing which houses the engine. Seals disposed within the flaps are spring biased and extensible beyond the side edges of the flaps. The seals of adjacent flaps are maintained in sealing engagement with each other when the flaps are adjusted between positions defining minimum nozzle flow area and the cruise position. Extensible spring biased seals are also disposed within the flaps adjacent to a supporting pylon to thereby engage the pylon in a sealing arrangement. The flaps are hinged to the casing at the central portion of the flaps leading edges and are connected to actuators at opposed outer portions of the leading edges to thereby maximize the mechanical advantage in the actuation of the flaps.

Official Gazette of the U S Patent and Trademark Office



08 AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities, piloting flight controls and autopilots

N79-14103* National Aeronautics and Space Administration
Langley Research Center, Hampton, Va

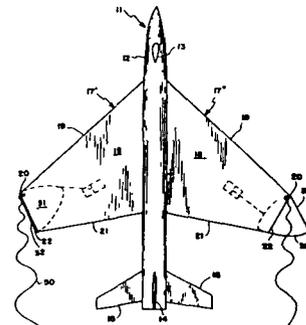
VORTEX-LIFT ROLL-CONTROL DEVICE Patent

John E Lamar, inventor (to NASA) Issued 2 Jan 1979 6 p
Filed 21 Mar 1977 Supersedes N77-31176 (15 - 22 p 2900)
Continuation-in-part of abandoned US Patent Appl SN-651002,
filed 21 Jan 1976

(NASA-Case-LAR-11868-2. US-Patent-4,132,375
US-Patent-Appl-SN-779429, US-Patent-Class-244-90R
US-Patent-Class-244-218 US-Patent-Class-244-46,
US-Patent-Appl-SN-651002) Avail US Patent and Trademark
Office CSCL 01C

A wing is described for aircraft of cropped arrow-type planform with thin leading and side edges. The wing has a pivotable tip to alter the crop angle of the wing during flight. Increasing the crop angle causes the wing side edge to become a trailing edge which reduces the strength of the side edge vortex flow. Decreasing the crop angle causes opposite results, in particular the side edge is now a leading edge and can generate a leading edge vortex flow. The wing constitutes a roll control device for aircraft of the stated design particularly effective at higher angles of attack.

Official Gazette of the U S Patent and Trademark Office



N79-15057*# National Aeronautics and Space Administration
Langley Research Center, Hampton, Va

COMPENSATING LINKAGE FOR MAIN ROTOR CONTROL Patent Application

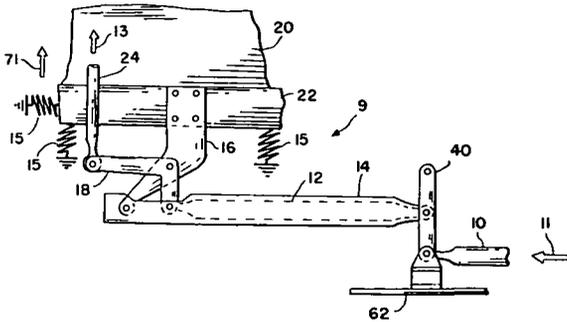
Phillip A Jeffery (Sikorsky Aircraft Div, Stratford Conn) and
Rudolf F Huber inventors (to NASA) Filed 15 Dec 1978
17 p Sponsored by NASA

(NASA-Case-LAR-11797-1 US-Patent-Appl-SN-969755) Avail
NTIS HC A02/MF A01 CSCL 01C

A helicopter rotor control system is described which will automatically compensate for unwanted signal inputs due to relative movement between an airframe structure and a rotor and transmission which is isolated from the airframe structure by a hydraulic cushion. The rotor control signal is transmitted to a summing linkage by means of a control rod. The summing linkage moves the inner rod by an amount proportional to the control signal which in turn adjusts the actuating rod by means of a bellcrank. The relative motion of transmission is passed to the outer compensating rod by a bracket. The compensating rod adjusts a summing link which moves the inner rod by an amount proportional to the relative motion of transmission. Thus relative motion of transmission is prevented from moving

09 RESEARCH AND SUPPORT FACILITIES (AIR)

the actuator rod and sending false control signals to the hydraulic actuators which change the pitch of the helicopter rotor blades
NASA



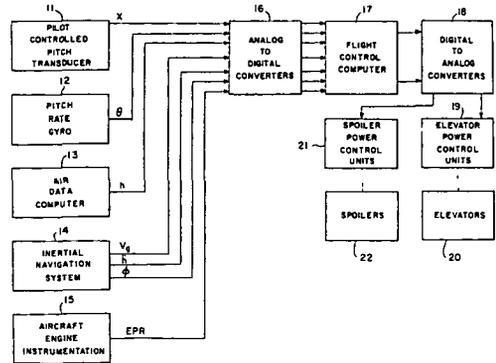
N79-20136* # National Aeronautics and Space Administration Langley Research Center Hampton, Va
A VELOCITY VECTOR CONTROL SYSTEM AUGMENTED WITH DIRECT LIFT CONTROL Patent Application
Henry F Tisdale Sr (Tisdale, Henry F, Sr Oakhurst, N J) and Wendell W Kelley, inventors (to NASA) Filed 28 Feb 1979 16 p Sponsored by NASA
(NASA-Case-LAR-12268-1, US-Patent-Appl-SN-015996) Avail NTIS HC A02/MF A01 CSCL 01C

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

N79-20135* # National Aeronautics and Space Administration Langley Research Center Hampton, Va
A PITCH ATTITUDE STABILIZATION SYSTEM UTILIZING ENGINE PRESSURE RATIO FEEDBACK SIGNALS Patent Application

Wendell W Kelley inventor (to NASA) Filed 28 Feb 1979 14 p
(NASA-Case-LAR-12562-1 US-Patent-Appl-SN-015995) Avail NTIS HC A02/MF A01 CSCL 01C

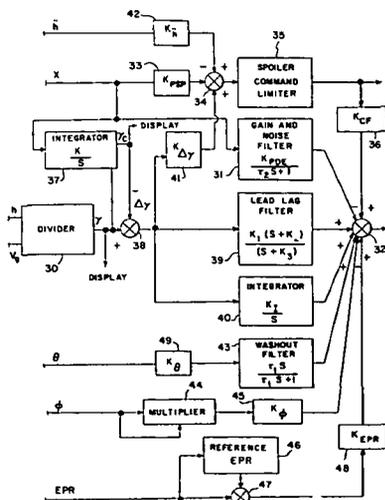
The invention relates to a pitch attitude stabilization system in which engine pressure ratio (EPR) signals are used to cancel pitching moments due to changes in thrust. The invention consists essentially of aircraft engine instrumentation 15 that generates an EPR signal. In a first embodiment of the invention the EPR signal is compared to a reference EPR signal 46 by means of a summing device 47. The resulting difference signal is multiplied by a constant K_{EPR} to form a control signal which cancels pitching moments due to changes in thrust. This control signal is added to the other pitch control signals by a summing device 32.
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)*

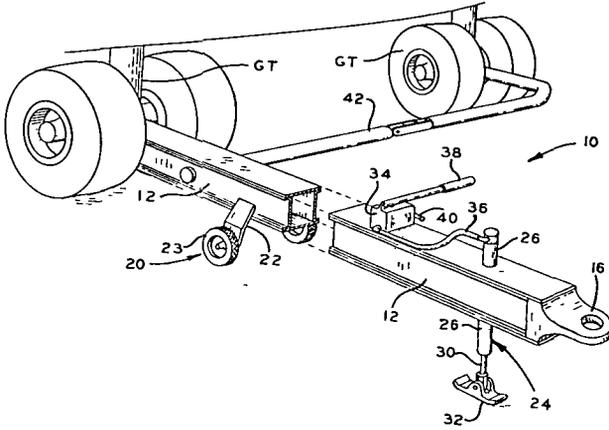


N79-10069* # National Aeronautics and Space Administration Hugh L Dryden Flight Research Center Edwards, Calif
TOW BAR FOR AIRCRAFT Patent Application
Paul Baldrige, inventor (to NASA) Filed 9 Aug 1978 11 p
(NASA-Case-FRC-11022-1 US-Patent-Appl-SN-932108) Avail NTIS HC A02/MF A01 CSCL 131

The tow bar of the instant invention includes a rigid elongated beam having a hitch located at each of its opposite ends for accommodating a coupling of the tow bar between a gear truck and a towing vehicle. Interposed between the center mass of the tow bar and the end thereof to be connected with a gear truck, there is provided a wheel transport assembly including wheels which serve as a fulcrum for the tow bar as one end is elevated for facilitating a coupling of the tow bar to a gear truck and a manually operable hydraulic jack for elevating the opposite end of the beam sufficiently for facilitating a hook-up with a towing vehicle, as well as to clear the transport wheels.

09 RESEARCH AND SUPPORT FACILITIES (AIR)

from engagement with the supporting surface of the aircraft By employing the tow bar of the instant invention it was found that one man can effect a coupling of the tow bar with a given aircraft in even less time than four to six men NASA



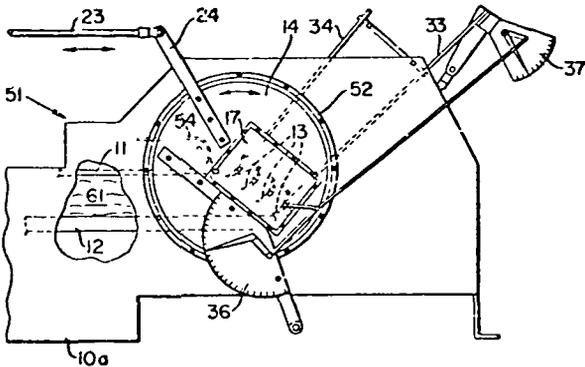
N79-21083* National Aeronautics and Space Administration Langley Research Center, Hampton Va
WIND TUNNEL Patent

Eldon M Wilson, inventor (to NASA) (Garrett Corp., Los Angeles) Issued 8 Jul 1969 3 p Filed 22 Jun 1967 Sponsored by NASA

(NASA-Case-LAR-10135-1 US-Patent-3,453,878, US-Patent-Appl-SN-648034 US-Patent-Class-73-147) Avail US Patent and Trademark Office CSCL 14B

A supersonic wind tunnel is described for testing several air foils mounted in a row A test section of a wind tunnel contains means for mounting air foil sections in a row means for rotating each section about an axis so that the angle of attack of each section changes with the other sections, and means for rotating the row with respect to the air stream so that the row forms an oblique angle with the air stream

Official Gazette of the U S Patent and Trademark Office



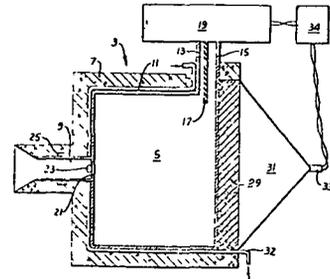
N79-21084* National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio
HYPERVELOCITY GUN Patent

Franklin C Ford (MB Assoc., San Ramon Calif) and Arthur J Biehl inventors (to NASA) Issued 21 Dec 1965 3 p filed 7 Jun 1962 Sponsored by NASA

(NASA-Case-XLE-03186-1, US-Patent-3,224,337, US-Patent-Appl-SN-200770, US-Patent-Class-89-8) Avail US Patent and Trademark Office CSCL 14B

A velocity amplifier system which uses both electric and chemical energy for projectile propulsion is provided in a compact hypervelocity gun suitable for laboratory use A relatively heavy layer of a tamping material such as concrete encloses a loop of an electrically conductive material An explosive charge at least partially surrounding the loop is adapted to collapse the loop upon detonation of the charge A source of electricity charges the loop through two leads, and an electric switch which is activated by the charge explosive charge, disconnects the leads from the source of electricity and short circuits them An opening in the tamping material extends to the loop and forms a barrel The loop, necked down in the opening, forms the sabot on which the projectile is located When the loop is electrically charged and the explosive detonated the loop is short circuited and collapsed thus building up a magnetic field which acts as a sabot catcher The sabot is detached from the loop and the sabot and projectile are accelerated to hypervelocity

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18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes spacecraft thermal and environmental control and attitude control

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

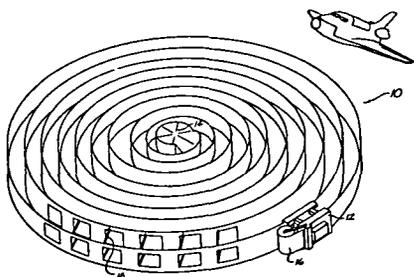
N79-11108* National Aeronautics and Space Administration Marshall Space Flight Center Huntsville Ala
APPARATUS FOR ASSEMBLING SPACE STRUCTURE Patent

James D Johnston Richard H Tuggle Jr John L Burch and Keith H Clark inventors (to NASA) Issued 31 Oct 1978 13 p Filed 31 Aug 1977 Supersedes N77-31213 (15 - 22 p 2904)

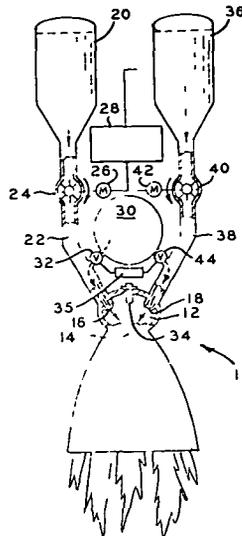
(NASA-Case-MFS-23579-1 US-Patent-4 122 991 US-Patent-Appl-SN-829316 US-Patent-Class-228-13 US-Patent-Class-228-15 1 US-Patent-Class-228-173 US-Patent-Class-244-159) Avail US Patent Office CSCL 22B

20 SPACECRAFT PROPULSION AND POWER

An apparatus for producing a structure in outer space from rolls of prepunched ribbon or sheet material that are transported from the earth to the apparatus located in outer space is described. The apparatus spins the space structure similar to a spider spinning a web utilizing the prepunched ribbon material. The prepunched ribbon material is fed through the apparatus and is shaped into a predetermined channel-shaped configuration. Trusses are punched out of the ribbon and are bent downwardly and attached to a track which normally is a previously laid sheet of material. The size of the overall space structure may be increased by merely attaching an additional roll of sheet material to the apparatus. Official Gazette of the U.S. Patent Office



the conduits for purposes of injecting the streams of fuel and oxidizer under pressure to the combustion chamber NASA



20 SPACECRAFT PROPULSION AND POWER

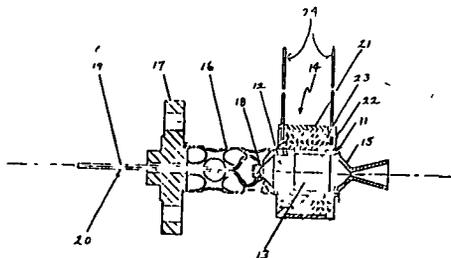
Includes main propulsion systems and components e.g rocket engines and spacecraft auxiliary power sources. For related information see also 07 Aircraft Propulsion, 28 Propellants and Fuels, and 44 Energy Production and Conversion

N79-16151*# National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt Md **LOW THRUST MONOPROPELLANT ENGINE Patent Application** John David Kuenzly, inventor (to NASA) (TRW Redondo Beach, Calif) 20 Dec 1978 13 p (NASA-Case-GSC-12194-2 US-Patent-Appl-SN-971474) Avail NTIS HC A02/MF A01 CSCL 21H

A low power thermal decomposition type monopropellant thruster is described which may operate in both the pulsing or steady-state modes at duty cycles representative of attitude and velocity control requirements for long-life, earth orbiting satellites. The device includes a conventional body and nozzle configuration with generally opposed injector tubes and a heater-screen pack configuration having a platinum screen and a refractory metal and oxide heater. Carbonaceous low freezing point propellants can be used. NASA

N79-13077*# National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala **A SYSTEM FOR CONCURRENTLY DELIVERING A STREAM OF POWDERED FUEL AND A STREAM OF POWDERED OXIDIZER TO A COMBUSTION CHAMBER FOR A REACTION MOTOR Patent Application** Leon M. Delionback and Richard M. Stein, inventors (to NASA) Filed 5 Dec 1978 15 p (NASA-Case-MFS-23904-1 US-Patent-Appl-Sn-966549) Avail NTIS HC A02/MF A01 CSCL 21H

A propellant delivery subsystem adapted to concurrently supply streams of powdered fuel and fluidized oxidizer includes one reservoir for powdered fuel and a second for powdered oxidizer. The particle size for the powdered fuel and powdered oxidizer is such that 99% will pass through a 100-235 mesh screen based on the Tyler 200 mesh screen system. Two flow control valves are provided in conduits connected to the reservoirs for metering streams of fuel and oxidizer flowing from the reservoirs to the combustion chamber. Injection of the powdered fuel and oxidizer is facilitated by a gas reservoir connected with



20 SPACECRAFT PROPULSION AND POWER

N79-20179* National Aeronautics and Space Administration
Lewis Research Center, Cleveland, Ohio

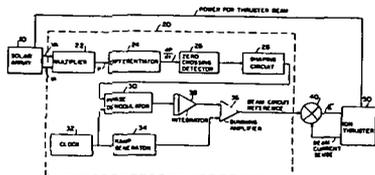
CLOSED LOOP SOLAR ARRAY-ION THRUSTER SYSTEM WITH POWER CONTROL CIRCUITRY Patent

Robert P Gruber inventor (to NASA) Issued 6 Mar 1979
8 p Filed 29 Mar 1978 Supersedes N78-22149 (16 - 13, p 1673)

(NASA-Case-LEW-12780-1, US-Patent-4,143 314, US-Patent-Appl-SN-891370, US-Patent-Class-323-15, US-Patent-Class-323-20) Avail US Patent and Trademark Office CSCL 20C

A power control circuit connected between a solar array and an ion thruster receives voltage and current signals from the solar array The control circuit multiplies the voltage and current signals together to produce a power signal which is differentiated with respect to time The differentiator output is detected by a zero crossing detector and after suitable shaping, the detector output is phase compared with a clock in a phase demodulator An integrator receives no output from the phase demodulator when the operating point is at the maximum power but is driven toward the maximum power point for non-optimum operation A ramp generator provides minor variations in the beam current reference signal produced by the integrator in order to obtain the first derivative of power

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N79-21123* National Aeronautics and Space Administration
Marshall Space Flight Center Huntsville, Ala

METHOD OF MAKING A ROCKET NOZZLE Patent

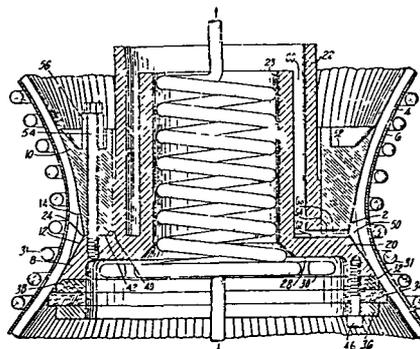
Daniel H Campbell, inventor (to NASA) (United Technologies Corp East Hartford, Conn) Issued 23 Dec 1969 4 p Filed 14 Sep 1966 Sponsored by NASA

(NASA-Case-XMF-06884-1, US-Patent-3,485,290, US-Patent-Appl-SN-579300 US-Patent-Class-164-105) Avail US Patent and Trademark Office CSCL 21H

A method is described for forming the interior of a nozzle having uneven walls so that a throat of smooth converging and diverging sides is provided for passing flow A metallic insert material is placed within the flow passageway adjacent to the area where the sharper throat constriction is to be formed, so

that the material will flow through the inlet into the throat space when liquefied

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N79-21124* National Aeronautics and Space Administration
Marshall Space Flight Center Huntsville Ala

FLUID THRUST CONTROL SYSTEM Patent

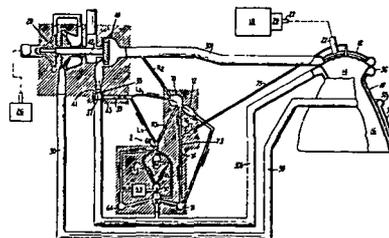
William L Howell (United Technologies Corp, Hartford Conn), Harvey B Jansen (United Technologies Corp Hartford, Conn) and Eugene N Lehmann, inventors (to NASA) (United Technologies Corp Hartford Conn) Issued 2 Jul 1968 7 p Filed 8 Sep 1966 Sponsored by NASA

(NASA-Case XMF-05964-1, US-Patent-3,390 528

US-Patent-Appl-SN-578397, US-Patent-Class-60-243) Avail US Patent and Trademark Office CSCL 21H

A pure fluid thrust control system is described for a pump-fed regeneratively cooled liquid propellant rocket engine A proportional fluid amplifier and a bistable fluid amplifier control overshoot in the starting of the engine and take it to a predetermined thrust An ejector type pump is provided in the line between the liquid hydrogen rocket nozzle heat exchanger and the turbine driving the fuel pump to aid in bringing the fluid at this point back into the regular system when it is not bypassed The thrust control system is intended to function in environments too severe for mechanical controls

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N79-21125* National Aeronautics and Space Administration
Marshall Space Flight Center, Huntsville, Ala

ROCKET INJECTOR HEAD Patent

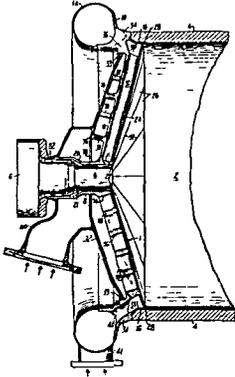
Charles W Green, Jr inventor (to NASA) (United Technologies Corp., Hartford, Conn) Issued 20 Aug 1968 7 p Filed 14 Sep 1966 Sponsored by NASA

(NASA-Case-XMF-04592-1, NASA-Case-XMF-04593-1

US-Patent-3,397,537, US-Patent-Appl-SN-579376,

US-Patent-Class-60-39 74) Avail US Patent and Trademark Office CSCL 21H

A high number of liquid oxygen and gaseous hydrogen orifices per unit area are provided in an injector head designed to give intimate mixing and more thorough combustion. The injector head comprises a main body portion, a cooperating plate member as a flow chamber for one propellant, a cooperating manifold portion for the second propellant, and an annular end plate for enclosing an annular propellant groove formed around the outer edge of the body. All the openings for one propellant are located at the same angle with respect to a radial plane to permit a short combustion chamber. ARH



24 COMPOSITE MATERIALS

Includes laminates

N79-14156* National Aeronautics and Space Administration
Goddard Space Flight Center, Greenbelt Md

ELECTRICALLY CONDUCTIVE THERMAL CONTROL COATINGS Patent

Michael Charles Shai inventor (to NASA) Issued 5 Sep 1978 5 p Filed 21 Oct 1977 Supersedes N78-11245 (16 - 02, p 0176)

(NASA-Case-GSC-12207-1, US-Patent-4,111 851

US-Patent-Appl-SN-844344, US-Patent-Class-252-518

US-Patent-Class-106-84, US-Patent-Class-106-296) Avail US Patent and Trademark Office CSCL 11D

A coating characterized by low thermal absorption high thermal emittance and high electrical conductivity comprises (1) a fired oxide pigment comprising a minor amount of aluminum oxide and a major amount of zinc oxide, (2) sufficient water to provide a mixture suitable for application to a substrate is presented. The fired oxide pigment may further include a minor amount of cobalt oxide. The resulting coating is particularly useful for coating the surfaces of spacecraft and similar objects.

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N79-16915* National Aeronautics and Space Administration
Ames Research Center, Moffett Field Calif

LOW DENSITY BISMALLEIMIDE-CARBON MICROBALLOON COMPOSITES Patent

Demetrius A Kourtidis and John A Parker inventors (to NASA) Issued 16 Jan 1979 7 p Filed 16 Mar 1977 Supersedes N77-19173 (15 - 10, p 1279)

(NASA-Case-ARC-11040-1 US-Patent-4,135 019

US-Patent-Appl-SN-778195, US-Patent-Class-428-117

US-Patent-Class-156-331 US-Patent-Class-428-119

US-Patent-Class-428-73 US-Patent-Class 428-458

US-Patent-Class-428-375) Avail US Patent and Trademark Office CSCL 11D

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

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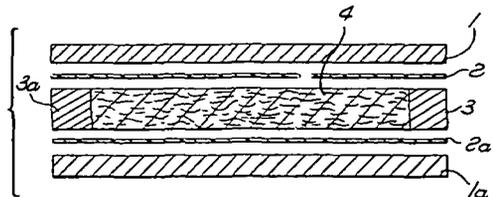
N79-16923*# National Aeronautics and Space Administration
Lyndon B Johnson Space Center Houston Tex

A METHOD AND TECHNIQUE FOR INSTALLING LIGHT-WEIGHT FRAGILE, HIGH-TEMPERATURE FIBER INSULATION Patent Application

Bhanu C Patel, inventor (to NASA) (Rockwell Intern Downey Calif) Filed 15 Dec 1978 10 p (Contract NAS9-14000)

(NASA-Case-MS-C-16934-1 US-Patent-Appl-SN-969757) Avail NTIS HC A02/MF A01 CSCL 11D

Light-weight insulation batting such as alumina/zirconia or preferably saffil high-temperature insulation alumina fiber 4 is precut into oversize elongated shapes. These shapes are saturated in an acrylic polymer resin in water solution and compressed in a mold to the required thickness or cross-sectional dimensions. The saturated batting is then dried in the mold and the resin cured at an appropriate temperature. The resulting rigidized batting may then be matched to a particular required shape and required dimensions for installation in wire-mesh sleeving or any cavity requiring the heat-barrier seal to be provided. The entire assembly is subsequently heated to a temperature much greater than the resin curing temperature to effect a clean burn-off of the resin material, leaving the original mineral batting material to expand into the interior shape of the containing cavity or wire-mesh sleeving if the insulation material is to be used as a heat seal around an openable door or hatch of a recoverable space vehicle. NASA



24 COMPOSITE MATERIALS

N79-17916* National Aeronautics and Space Administration
Lewis Research Center Cleveland Ohio
METHOD OF MAKING BEARING MATERIALS Patent
Harold E Sliney inventor (to NASA) Issued 23 Jan 1979
5 p Filed 13 Dec 1977 Division of US Patent Appl SN-764245,
filed 31 Jan 1977 which is a 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 US-Patent-3
953 343

(NASA-Case-LEW-11930-4 US-Patent-4 136 211,
US-Patent-Appl-SN-860406 US-Patent-Class-427-34,
US-Patent-Class-252-12 2 US-Patent-Class-308-78,
US-Patent-Class-308-87R US-Patent-Class-308-168
US-Patent-Class-308-171 US-Patent-Class-308-DIG 8
US-Patent-Class-308-DIG 9 US-Patent-Class-427-292
US-Patent-Class-427-327 US-Patent-Class-427-328,
US-Patent-Class-427-355, US-Patent-Class-427-376B,
US-Patent-Class-427-376C US-Patent-3,953 343
US-Patent-Appl-SN-764245 US-Patent-Appl-SN-616528,
US-Patent-Appl-SN-513611) Avail US Patent and Trademark
Office CSCL 11D

A method is described for making a composite material which provides low friction surfaces for materials in rolling or sliding contact The composite material which is self-lubricating and oxidation resistant up to and in excess of about 930 C is comprised of a metal component which lends strength and elasticity to the structure and a fluorine salt component which provides oxidation protection to the metal but may also enhance the lubrication qualities of the composite

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25 INORGANIC AND PHYSICAL CHEMISTRY

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

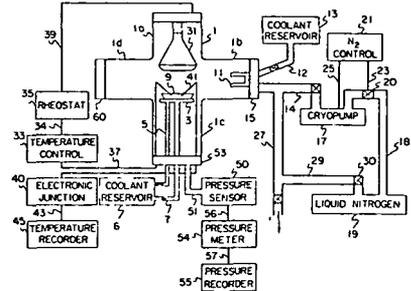
For related information see also 77 *Thermodynamics and Statistical Physics*

N79-10162* National Aeronautics and Space Administration
Ames Research Center Moffett Field Calif
PROCESS FOR THE PREPARATION OF CALCIUM SUPER-OXIDE Patent

E Vernon Ballou (San Jose State Univ Calif) Peter C Wood (San Jose State Univ, Calif) Theodore J Wydeven and Leroy A Spitzke inventors (to NASA) (San Jose State Univ Calif) Issued 18 Jul 1978 13 p Filed 11 Jul 1977 Supersedes N77-29252 (15 - 20 p 2645)
(NASA-Case-ARC-11053-1 US-Patent-4 101 644
US-Patent-Appl-SN-814378 US-Patent-Class-423-581
US-Patent-Class-23-252R) Avail US Patent Office CSCL 07D

Calcium superoxide is prepared in high yields by spreading a quantity of calcium peroxide diperoxyhydrate on the surface of a container positioning said container in a vacuum chamber on a support structure through which a coolant fluid can be circulated partially evacuating said vacuum chamber allowing the temperature of the diperoxyhydrate to reach the range of about 0 to about 40 C maintaining the temperature selected for a period of time sufficient to complete the disproportionation of the diperoxyhydrate to calcium superoxide calcium hydroxide, oxygen and water constantly and systematically removing the water as it is formed by sweeping the reacting material with a current of dry inert gas and/or by condensation of said water

on a cold surface backfilling the chamber with a dry inert gas and finally recovering the calcium superoxide produced
Official Gazette of the U S Patent Office



N79-10163* National Aeronautics and Space Administration
Pasadena Office Calif

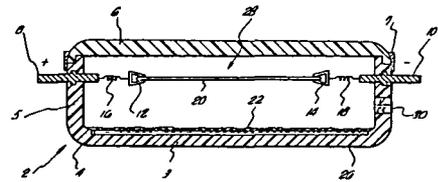
PORTABLE ELECTROPHORESIS APPARATUS USING MINIMUM ELECTROLYTE Patent

Mario R Stevens (JPL) and John Michael Vickers, inventors (to NASA) (JPL) Issued 13 Jan 1976 5 p Filed 15 Oct 1973
Sponsored by NASA

(NASA-Case-NPO-13274-1 US-Patent-3 932 262
US-Patent-Appl-SN-406296 US-Patent-Class-204-299
US-Patent-Class-204-180S) Avail US Patent Office CSCL 07D

An electrophoresis unit for use in conducting electrophoretic analysis of specimens is described The unit includes a sealable container in which a substrate mounted specimen is suspended in an electrolytic vapor A heating unit is employed to heat a supply of electrolyte to produce the vapor The substrate is suspended within the container by being attached between a pair of clips which also serve as electrodes to which a direct current power source may be connected

Official Gazette of the U S Patent Office



N79-10167*# National Aeronautics and Space Administration
Pasadena Office Calif

OZONATION OF COOLING TOWER WATERS Patent Application

Marshall F Humphrey (JPL) Kenneth R French (JPL) and Ronald

D Howe inventors (to NASA) (JPL) Filed 29 Sep 1978
 10 p
 (Contract NAS7-100)
 (NASA-Case-NPO-14340-1 US-Patent-Appl-SN-946992) Avail
 NTIS HC A02/MF A01 CSCL 07D

This invention relates to inhibition of corrosion and algae in heat exchange water streams. The previously used chromium additives did little to prevent biological growth and though effective and inexpensive in protecting metals from corrosion its use was restricted due to environmental problems. Ozone was utilized at low levels in conjunction with other additives to control bacteria and microorganisms
 NASA

N79-10168* National Aeronautics and Space Administration
 Pasadena Office, Calif

A PROCESS FOR CONVERTING AMORPHOUS TO CRYSTALLINE SILICON WITH ATTENDANT PURIFICATION
 Patent Application

William M Ingle (Motorola Inc, Phoenix, Ariz) and Gilbert Vasquez inventors (to NASA) (Motorola Inc Phoenix, Ariz) Filed 31 Aug 1978 12 p
 (Contract JPL-954442)
 (NASA-Case-NPO-14223-1 US-Patent-Appl-SN-938580) Avail
 NTIS HC A02/MF A01 CSCL 07D

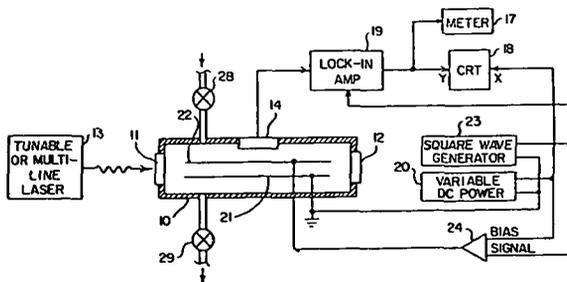
The invention relates to a process for converting amorphous to crystalline silicon with attendant purification. The invention is embodied in a process wherein amorphous silicon is heated to a temperature above approximately 730 deg in vacuo for initiating exothermic conversion of the amorphous silicon to silicon in its dendritic form accompanied by an instantaneous expulsion of impurities whereby the purity of the resultant silicon is enhanced
 NASA

N79-10169* National Aeronautics and Space Administration
 Pasadena Office, Calif

STARK CELL OPTOACOUSTIC DETECTION OF CONSTITUENT GASES IN SAMPLE Patent Application

Jack S Margolis (JPL) and Michael S Shumate inventors (to NASA) (JPL) Filed 31 Aug 1978 14 p
 (Contract NAS7-100)
 (NASA-Case-NPO-14143-1, NASA-Case-NPO-14342-1
 US-Patent-Appl-SN-938297) Avail NTIS HC A02/MF A01
 CSCL 07D

The invention relates to an improved optoacoustic detector and a method of using such an improved detector with a multiline laser for determining the combination of constituent gases in a sample, and determining the concentration of parts per million of each concentration
 NASA

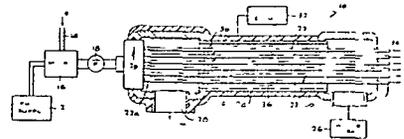


N79-11151* National Aeronautics and Space Administration
 Pasadena Office Calif

COMBUSTER Patent

Richard A McKay inventor (to NASA) (JPL) Issued 1 Aug 1978 7 p Filed 26 Nov 1976 Sponsored by NASA
 (NASA-Case-NPO-13958-1 US-Patent-4 104 018
 US-Patent-Appl-SN-745384 US-Patent-Class-432-29
 US-Patent-Class-126-91A US-Patent-Class-431-10
 US-Patent-Class-431-208 US-Patent-Class-432-223) Avail US
 Patent Office CSCL 21B

A combustor is provided for utilizing a combustible mixture containing fuel and air to heat a load fluid such as water or air in a manner that minimizes the formation of nitrogen oxide. The combustible mixture passes through a small diameter tube where the mixture is heated to its combustion temperature while the load fluid flows past the outside of the tube to receive heat. The tube is of a diameter small enough that the combustible mixture cannot form a flame and yet is not subject to wall quench so that combustion occurs but at a temperature less than under free flame conditions. Most of the heat required for heating the combustible mixture to its combustion temperature is obtained from heat flow through the walls of the pipe to the mixture
 Official Gazette of the U S Patent Office

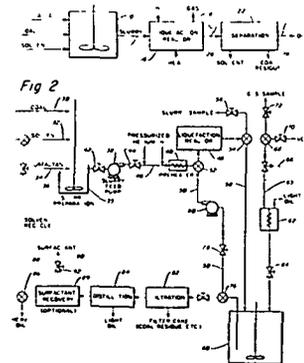


N79-11152* National Aeronautics and Space Administration
 Pasadena Office Calif

SURFACTANT-ASSISTED LIQUEFACTION OF PARTICULATE CARBONACEOUS SUBSTANCES Patent

George C Hsu inventor (to NASA) (JPL) Issued 24 Oct 1978 8 p Filed 7 Oct 1976 Supersedes N78-25237 (16 - 16 p 2097) Sponsored by NASA
 (NASA-Case-NPO-13904-1 US-Patent-4 121 995
 US-Patent-Appl-SN 730468 US-Patent-Class-208-8
 US-Patent-Class-208-10 US-Patent-Class 44-51
 US-Patent Class-302-66) Avail US Patent Office CSCL 07D

A slurry of carbonaceous particles such as coal containing an oil soluble polar substituted oleophilic surfactant suitably an amine substituted long chain hydrocarbon is liquefied at high temperature and high hydrogen presence. The pressure of surfactant results in an increase in yield and the conversion product contains a higher proportion of light and heavy oils and less asphaltene than products from other liquefaction processes
 Official Gazette of the U S Patent Office



25 INORGANIC AND PHYSICAL CHEMISTRY

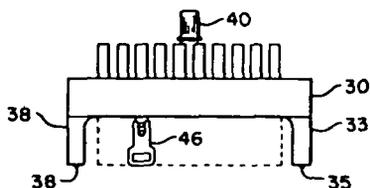
N79-14169* National Aeronautics and Space Administration
Ames Research Center Moffett Field Calif

MICROELECTROPHORETIC APPARATUS AND PROCESS Patent

Benjamin W Grunbaum, inventor (to NASA) (Calif Univ, Berkeley)
Issued 19 Dec 1978 14 p Filed 10 Nov 1977 Supersedes
N78-11216 (16 - 02 p 0172) Sponsored by NASA
(NASA-Case-ARC-11121-1, US-Patent-4,130,471
US-Patent-Appl-SN-850507, US-Patent-Class-204/180G,
US-Patent-Class-204-180S, US-Patent-Class-204-299R
US-Patent-Class-23-230B, US-Patent-Class-424-12) Avail US
Patent and Trademark Office CSCL 07D

New gel tray and lid assemblies designed for use in conjunction with slotted electrophoretic membranes were developed to take advantage of recently improved microelectrophoretic accessories which include a multisample applicator capable of applying up to 10 samples consecutively or simultaneously and a temperature control plate for dissipating the heat produced by electrophoresis in a gel. The trays and membranes can be marketed ready for use as electrophoretic media or impregnated with various specific substrates and dyes.

Official Gazette of the U S Patent and Trademark Office



N79-14171*# National Aeronautics and Space Administration
Marshall Space Flight Center, Huntsville Ala

PROCESS FOR PREPARATION OF LARGE-PARTICLE SIZE MONODISPERSE LATEXES Patent Application

John W Vanderhoff (Lehigh Univ Bethlehem, Pa), Fortunato J Micale (Lehigh Univ Bethlehem, Pa), Mohammed S Ed-Aasser (Lehigh Univ Bethlehem Pa) and Dale M Kornfeld, inventors (to NASA) Filed 29 Dec 1978 14 p
(NASA-Case-MFS-25000-1, US-Patent-Appl-SN-974474) Avail
NTIS HC A02/MF A01 CSCL 07D

Monodisperse latexes having a particle size over 2 microns are prepared by seeded emulsion polymerization in microgravity. A reaction mixture containing smaller monodisperse latex seed particles and predetermined amounts of monomer, emulsifier, initiator, inhibitor and water is placed in the microgravity environment of outer space, and polymerization is initiated by heating. The reaction is continued under mild agitation until the seed particles grow to a predetermined size, and the resulting enlarged particles are recovered. Novelty of the invention resides in the use of a microgravity environment to exceed the previous maximum attainable particle size. The use of a closed expandable reaction vessel and specific combinations of reactants and reaction conditions may also be novel. NASA

N79-14172*# National Aeronautics and Space Administration
Lewis Research Center Cleveland, Ohio

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

D W Sheibley, W H Philipp, and L C Hsu, inventors (to NASA) Filed 20 Dec 1978 13 p
(NASA-Case-LEW-13103-1 US-Patent-Appl-SN-971596) Avail
NTIS HC A02/MF A01 CSCL 07D

A self-supporting sheet structure comprising a water soluble, non-cross-linked polymer, such as polyvinyl alcohol, is reported which is capable of being cross-linked by reaction with hydrogen atom radicals and hydroxyl molecule radicals in an aqueous solution having a pH of less than 8 and containing a dissolved salt in an amount sufficient to prevent dissolution of the non-cross-linked polymer. The aqueous solution is then irradiated with ionizing radiation to form hydrogen atom radicals and hydroxyl molecule radicals. The irradiation is continued for a time sufficient 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. NASA

N79-14173*# National Aeronautics and Space Administration
Lewis Research Center, Cleveland Ohio

CROSS-LINKED POLYVINYL ALCOHOL AND METHOD OF MAKING SAME Patent Application

Li-Chen Hsu, Dean W Heibley, and Warren H Philipp, inventors (to NASA) Filed 20 Dec 1978 12 p
(NASA-Case-LEW-13101-1, US-Patent-Appl-SN-971473) Avail
NTIS HC A02/MF A01 CSCL 07D

A polyvinyl alcohol battery separator is described which has good tensile strength, good resistance to conditions prevailing in alkaline batteries, and an electrical resistivity of less than 1 ohm/sq cm. The product is made by admixing polyvinyl alcohol, preferably in the form of a readily available aqueous solution, and a polyaldehyde-polysaccharide such as inexpensive readily available polydialdehyde starch. The admixture is formed into a sheet by casting an aqueous admixture of the resin and the cross-linking agent. The dried sheet or film is cut to size if desired and may be assembled into bag form for use in a battery. Cross-linking is effected by contacting the film, with a conventional aqueous acid catalyst solution, in an amount sufficient to prevent dissolution of the polymer in the aqueous acid solution. NASA

N79-14174*# National Aeronautics and Space Administration
Lewis Research Center Cleveland Ohio

IN-SITU CROSS-LINKING OF POLYVINYL ALCOHOL Patent Application

W H Philipp, L C Hsu, and D W Sheibley, inventors (to NASA) Filed 20 Dec 1978 13 p
(NASA-Case-LEW-13135-1, US-Patent-Appl-SN-971475) Avail
NTIS HC A02/MF A01 CSCL 07D

Precise control of crosslinking in the preparation of polyvinyl alcohol battery separators is achieved by incorporating the crosslinking agent in the polyvinyl alcohol and then effecting crosslinking after the polymer is shaped or fabricated into a useful configuration. Aqueous polyvinyl alcohol is admixed with an aqueous dialdehyde crosslinking agent. The pH of the solution is preferably alkaline to prevent premature crosslinking reaction. The aqueous admixture is cast into a sheet and dried to form a self-supporting film which is then immersed in an aqueous acid catalyst solution containing a dissolved salt in an amount sufficient to inhibit dissolution of the noncrosslinked polymer. The resultant crosslinked film has excellent properties, such as low electrical resistivity, rendering the film suitable for use as a separator for an alkaline battery. NASA

26 METALLIC MATERIALS

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

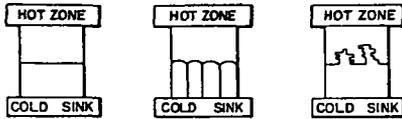
N79-16943*# National Aeronautics and Space Administration
Marshall Space Flight Center, Huntsville Ala

PREPARATION OF MONOTECTIC ALLOYS HAVING A

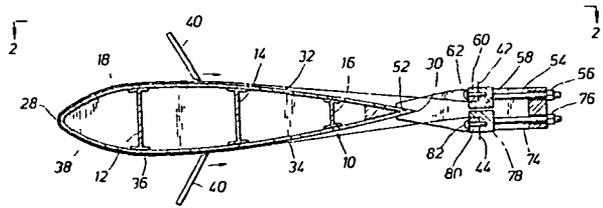
CONTROLLED MICROSTRUCTURE BY DIRECTIONAL SOLIDIFICATION UNDER DOPANT-INDUCED INTERFACE BREAKDOWN Patent Application

Richard A Parr Mary H Johnston and John C McClure inventors (to NASA) Filed 29 Dec 1978 19 p (NASA-Case-MFS-23816-1, US-Patent-Appl-SN-974292) Avail NTIS HC A02/MF A01 CSCL 11F

Monotectic alloys having aligned spherical particles or 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. A dopant is provided capable of breaking down the liquid-solid interface for the chosen alloy, and directionally solidifying 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 there-between are controlled by the amount of dopant, 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. NASA



of the airfoil is cleaned, then coated with a thin layer of a fluid adhesive over which a sheet of thin plastic film is stretched. Tension is applied to the film and the resultant surface is then squeezed to cause the adhesive to conform to the irregularities, remove any bubbles, and smooth out any wrinkles in the film. The adhesive is then allowed to set. The resulting surface is smooth and relatively free of the normal irregularities present in the standard metal airfoil particularly for low speed aircraft. NASA



27 NONMETALLIC MATERIALS

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

N79-19145*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

HIGH TOUGHNESS-HIGH STRENGTH IRON ALLOY Patent Application

J R Stephens and W R Witzke, inventors (to NASA) 25 Jan 1979 11 p

(NASA-Case-LEW-12542-3 US-Patent-Appl-SN-007083) Avail NTIS HC A02/MF A01 CSCL 11F

An improved steel alloy is described which exhibits both high toughness and high strength at cryogenic temperatures. The alloy consists essentially of about 10 to 16 percent by weight nickel up to 10 percent by weight aluminum and up to about 3 percent by weight of at least one of the following additional elements: copper, lanthanum, niobium, tantalum, titanium, vanadium, yttrium, zirconium and the rare earth metals, with the balance being essentially iron. The steel alloy is produced by a process which includes using cold rolling at room temperature and subsequent heat treatment at temperatures ranging from 500 deg to 650 C. The alloy possesses a fracture toughness ranging from 200 to 230 ksi in and yield strengths up to 230 ksi. NASA

N79-11215*# National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif

AMBIENT CURE POLYIMIDE FOAMS Patent Application

Paul M Sawko, Salvatore R Riccitiello, and Charles L Hamermesh, inventors (to NASA) (Rockwell Intern., Thousand Oaks, Calif) Filed 31 Oct 1978 15 p

(NASA-Case-ARC-11170-1, US-Patent-Appl-SN-956161) Avail NTIS HC A02/MF A01 CSCL 07D

Flame and temperature resistant polyimide foams are prepared by the reaction of an aromatic dianhydride (pyromellitic dianhydride) with an aromatic polyisocyanate (polymethylene polyphenylisocyanate), in the presence of an inorganic acid and furfuryl alcohol. Usable acids include dilute sulfuric acid, dilute nitric acid, hydrochloric acid, polyphosphoric acid, and phosphoric acid, with the latter being preferred. The dianhydride and the isocyanate in about equimolar proportions constitute about 50% of the reaction mixture, the rest being made up with the acid and the alcohol in a ratio of about 1:10. An exothermic reaction between the acid and the alcohol provides the heat necessary for the other components to polymerize without recourse to external heat sources. The mixture can be sprayed on any surface to form polymeric foam in locations where the application of heat is not practical or possible, for instance between walls or on mine tunnel surfaces. NASA

N79-21183*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex

SURFACE FINISHING Patent Application

Jack A Kinzler, James T Heffernan, Leroy G Fehrenkamp, and William S Lee, inventors (to NASA) Filed 25 Jan 1979 26 p

(NASA-Case-MS-C-12631-3 US-Patent-Appl-SN-006952) Avail NTIS HC A03/MF A01 CSCL 11F

A manufacturing process is described which reduces or eliminates air turbulence created by surface irregularities in metal airfoils due to rivets, wrinkles or butt-joints. The metal surface

N79-11216*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

MODIFICATION OF THE ELECTRICAL AND OPTICAL PROPERTIES OF POLYMERS Patent Application

M J Mirtich and James S Sovey, inventors (to NASA) Filed 7 Nov 1978 11 p

(NASA-Case-LEW-13027-1 US-Patent-Appl-SN-958575) Avail NTIS HC A02/MF A01 CSCL 07C

27 NONMETALIC MATERIALS

The surface of a polymer is irradiated to modify the optical and electrical properties as well as to change the surface morphology. A polymer is placed in a vacuum of about 4×10 to the minus 5th power torr. A surface of the polymer is exposed to a beam of argon ions having an energy between 500 and 1000 eV and an ion beam current density between 0.1 and 1.0 mA/sq cm. The resulting texturing of the surface causes a large decrease in spectral transmittance at all wavelengths. The surface conductivity of the polymer is also increased. The textured surface further enhances the adherence of thin films to the polymer. A polyimide, (Kaptan) and a fluorinated ethylene propylene (Teflon) are surface treated in accordance with the invention.

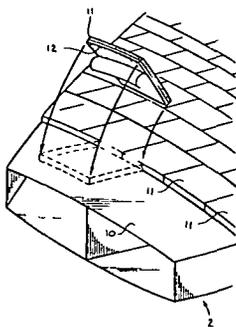
NASA

N79-12221* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston Tex
THERMAL INSULATION ATTACHING MEANS Patent
Lubert J Leger (inventor (to NASA)) Issued 7 Nov 1978 5 p
Filed 12 Apr 1977 Supersedes N7731237 (15 - 22, p 2908)
Continuation-in-part of abandoned US Patent Appl SN-555750
filed 5 Mar 1975

(NASA-Case-MS-C-12619-2, US-Patent-4,124,732,
US-Patent-Appl-SN-786913, US-Patent-Class-428-77,
US-Patent-Class-244-121 US-Patent-Class-244-158,
US-Patent-Class-244-160, US-Patent-Class-428-189,
US-Patent-Class-428-212, US-Patent-Class-428-332,
US-Patent-Class-428-280, US-Patent-Class-428-285,
US-Patent-Class-428-286 US-Patent-Class-428-447,
US-Patent-Class-428-450, US-Patent-Class-428-920,
US-Patent-Appl-SN-555750) Avail US Patent and Trademark
Office CSCL 11A

An improved isolation system is provided for attaching ceramic tiles of insulating material to the surface of a structure to be protected against extreme temperatures of the nature expected to be encountered by the space shuttle orbiter. This system isolates the fragile ceramic tiles from thermally and mechanically induced vehicle structural strains. The insulating tiles are affixed to a felt isolation pad formed of closely arranged and randomly oriented fibers by means of a flexible adhesive and in turn the felt pad is affixed to the metallic vehicle structure by an additional layer of flexible adhesive.

Official Gazette of the U S Patent and Trademark Office



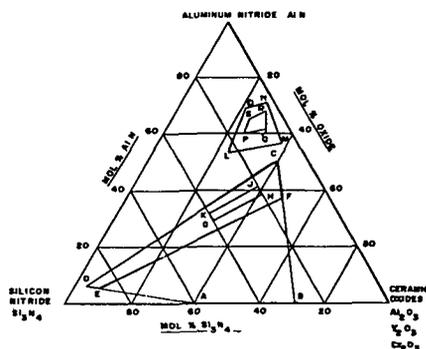
N79-14213* National Aeronautics and Space Administration Pasadena Office, Calif
HIGH TEMPERATURE RESISTANT CERMET AND CERAMIC COMPOSITIONS Patent

Wayne M Phillips, inventor (to NASA) (JPL) Issued 26 Dec 1978 8 p Filed 8 Dec 1977 Supersedes N78-25218 (16 - 16, p 2094) Division of US Patent Appl SN-633876, filed 20 Nov 1975, US Patent-4,072,532 Sponsored by NASA (NASA-Case-NPO-13690-2 US-Patent-4,131,459,

US-Patent-Appl-SN-858766 US-Patent-Class-75-203,
US-Patent-Class-75-205, US-Patent-Class-75-206,
US-Patent-Class-75-212, US-Patent-Class-75-226,
US-Patent-Class-264-60 US-Patent-Appl-SN-633876,
US-Patent-4,072,532) Avail US Patent and Trademark Office
CSCL 11C

Cermet compositions having high temperature oxidation resistance, high hardness and high abrasion and wear resistance and particularly adapted for production of high temperature resistant cermet insulator bodies are presented. The compositions are comprised of a sintered body of particles of a high temperature resistant metal or metal alloy preferably molybdenum or tungsten particles, dispersed in and bonded to a solid solution formed of aluminum oxide and silicon nitride and particularly a ternary solid solution formed of a mixture of aluminum oxide, silicon nitride and aluminum nitride. Also disclosed are novel ceramic compositions comprising a sintered solid solution of aluminum oxide, silicon nitride and aluminum nitride.

Official Gazette of the U S Patent and Trademark Office



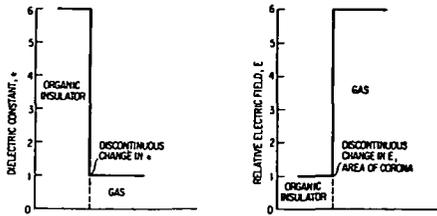
N79-14214* National Aeronautics and Space Administration Ames Research Center, Moffett Field Calif
PREPARATION OF DIELECTRIC COATING OF VARIABLE DIELECTRIC CONSTANT BY PLASMA POLYMERIZATION Patent

Martin Hudis (Allis-Chalmers, Milwaukee) and Theodore Wydeven, inventors (to NASA) Issued 2 Jan 1979 8 p Filed 11 Feb 1977 Supersedes N77-17245 (15 - 08, p 1010) Division of abandoned US Patent Appl SN-589172 filed 23 Jun 1975 (NASA-Case-ARC-10892-2 US-Patent-4,132,829,
US-Patent-Appl-SN-767912, US-Patent-Class-428-411,
US-Patent-Class-427-41, US-Patent-Class-427-294,
US-Patent-Appl-SN-589172) Avail US Patent and Trademark
Office CSCL 07C

A plasma polymerization process for the deposition of a dielectric polymer coating on a substrate comprising disposing of the substrate in a closed reactor between two temperature controlled electrodes connected to a power supply is presented. A vacuum is maintained within the closed reactor, causing a monomer gas or gas mixture of a monomer and diluent to flow into the reactor generating a plasma between the electrodes. The vacuum varies and controls the dielectric constant of the polymer coating being deposited by regulating the gas total and

partial pressure, the electric field strength and frequency, and the current density

Official Gazette of the U S Patent and Trademark Office

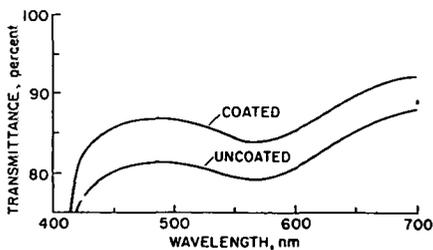


N79-18052* National Aeronautics and Space Administration
Ames Research Center Moffett Field Calif
OXYGEN POST-TREATMENT OF PLASTIC SURFACE COATED WITH PLASMA POLYMERIZED SILICON-CONTAINING MONOMERS Patent

Theodore J Wydeven and John R Hollanhan Jr inventors (to NASA) Issued 30 Jan 1979 5 p Filed 21 Mar 1977 Supersedes N77-20256 (15 - 11, p 1433) Continuation-in-part of abandoned US Patent Appl SN-634304 filed 21 Nov 1975 (NASA-Case-ARC-10915-2 US-Patent-4 137 365 US-Patent-Appl-SN-779883 US-Patent-Class-428-412 US-Patent-Class-427-40 US-Patent-Class-427-41 US-Patent-Class-428-447 US-Patent-Class-428-451 US-Patent-Appl-SN-634304) Avail US Patent and Trademark Office CSCL 11B

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

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N79-19160*# National Aeronautics and Space Administration
Langley Research Center Hampton, Va
MIXED DIAMINES FOR LOWER MELTING ADDITION POLYIMIDE PREPARATION AND UTILIZATION Patent Application

Terry L St Clair inventor (to NASA) 13 Feb 1979 12 p (NASA-Case-LAR-12054-2 US-Patent-Appl-SN-011737) Avail NTIS HC A02/MF A01 CSCL 07C

An essentially solventless process is presented for preparing addition type polyimide prepreg that retains good drape, tack and other mechanical properties NASA

N79-21190* National Aeronautics and Space Administration
Marshall Space Flight Center, Huntsville, Ala
INFUSIBLE SILAZANE POLYMER AND PROCESS FOR PRODUCING SAME Patent

Robert E Burks, Jr (Southern Res Inst, Birmingham, Ala), Robert E Lacey (Southern Res Inst, Birmingham Ala), and Charles L Christy, Jr, inventors (to NASA) (Southern Res Inst Birmingham, Ala) Issued 28 Mar 1967 2 p Filed 30 Aug 1965 Sponsored by NASA

(NASA-Case-XMF-02526-1, NASA-Case-XMF-02527-1

NASA-Case-XMF-02783-1, US-Patent-3,311 571

US-Patent-Appl-SN-483817, US-Patent-Class-260-2) Avail US Patent and Trademark Office CSCL 07D

Coatings of high thermal and chemical stability for application to metal, glass, ceramics, and other surfaces are formed by reacting diphenyldichlorosilane in the presence of triethylamine with a nitrogen base selected from the group consisting of ammonia and methylamine. The polymeric noncrystalline reaction product is heated in a reaction zone open to the atmosphere at a temperature ranging from approximately 250 C to 450 C until the infusible polymer is formed. A R H

N79-21191* National Aeronautics and Space Administration
Marshall Space Flight Center, Huntsville, Ala
FLUORINE-CONTAINING POLYFORMALS Patent

Floyd D Trischler, inventor (to NASA) (Whittaker Corp, Los Angeles) Issued 31 Dec 1968 2 p Filed 3 Jun 1966 Sponsored by NASA

(NASA-Case-XMF-06900-1, US-Patent-3,419,531,

US-Patent-Appl-SN-554959, US-Patent-Class-260-67) Avail US Patent and Trademark Office CSCL 07C

A fluorine-containing polymeric polyformal is described which has the repeating unit $O-CH_2-O-CH_2(CF_2)_n-CH_2$ wherein n is an integer of from about 3 to about 6 prepared by reacting trioxane with a diol having the formula $HO-CH_2(CF_2)_n-CH_2-OH$. These polymeric polyformals are useful directly for impervious coatings on metals and the like.

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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

N79-10224*# National Aeronautics and Space Administration
Pasadena Office Calif

SILICONE CONTAINING SOLID PROPELLANT Patent Application

Kumar N R Ramohalli inventor (to NASA) (JPL) Filed 16 Oct 1978 12 p (Contract NAS7-100)

(NASA-Case-NPO-14477-1 US-Patent-Appl-SN-951830) Avail NTIS HC A02/MF A01 CSCL 211

The invention relates to elimination of aluminum oxide slag deposit in the nozzle throat of laboratory scale end burner units utilized in developmental programs which interferes with testing of metal containing solid rocket propellants for L-star instability characteristics. Addition of a small amount of a liquid silicone oil to a metal containing solid rocket propellant provides a significant reduction in heat transfer to the inert nozzle walls eliminating or reducing metal oxide slag collection and blockage of the nozzle throat. It was further discovered that the burning

28 PROPELLANTS AND FUELS

rate of these propellants is increased by about 5 to 10% providing improved ballistic performance NASA

N79-10225*# National Aeronautics and Space Administration Pasadena Office Calif

RECOVERY OF ALUMINUM AND BINDER FROM COMPOSITE PROPELLANTS Patent Application

Graham C Shaw inventor (to NASA) (Thiokol Chemical Corp Brigham City Utah) Filed 29 Sep 1978 14 p (Contract JPL-954161)

(NASA-Case-NPO-14110-1 US-Patent-Appl-SN-947000) Avail NTIS HC A02/MF A01 CSCL 211

The metal fuel powder and the resin are recovered from propellant binder containing less than 15% oxidizer salt by dissolution of the binder in an active transesterification solvent such as an alcoholic solution of an alkali metal alkoxide of the formula MOR where M is an alkali metal suitably sodium or potassium and R is an alkyl group containing 1 to 6 carbon atoms. The alcohol is an alkanol containing 1 to 6 carbon atoms. When moisture is excluded from the system the highly basic alkyl oxide radical has little effect upon the Al present but reacts very rapidly with the binder. Mixed solvents of either methanol and tetrahydrofuran or toluene were effective in the transesterification reactions. The products of the reaction were soluble in toluene. Washing the binder from the Al generally resulted in the recovery of 98.7 to 99.7% of the theoretical amount. Analysis for active aluminum content ranged from 98.5 to 98%. The low oxidizer aluminum-binder residue is obtained by an aqueous leach of the scrap propellant. NASA

N79-10227*# National Aeronautics and Space Administration Pasadena Office Calif

PROCESS FOR THE LEACHING OF AP FROM PROPELLANT Patent Application

Graham C Shaw (Thiokol Corp Brigham City Utah) and Meldon J McIntosh inventors (to NASA) (Thiokol Corp Brigham City Utah) Filed 29 Sep 1978 17 p (Contract JPL-954161)

(NASA-Case-NPO-14109-1 US-Patent-Appl-SN-946990) Avail NTIS HC A02/MF A01 CSCL 211

The invention relates to recovery of inorganic oxidizing salt such as ammonium perchlorate (AP) from waste propellant. In a method of recovery of AP by leaching the chunks agglomerate requiring continuous high energy mixing. In the invention the agglomeration of the propellant is prevented by the addition of surface active agents which are absorbed upon the propellant binder surfaces reducing the tacky nature of the exposed surfaces. The power required to mix the water slurred propellant was less than 1/50th that required to mix the pyrotechnic materials having the tacky nature of the wet agglomerated propellant and not containing the dispersing agent. Extraction of up to 98% AP was achieved from slurries containing over 40% propellant. The chemical purity of the recovered AP is acceptable for reuse in propellant compositions for resale or for use in slurred explosives. NASA

N79-11231* National Aeronautics and Space Administration Pasadena Office Calif

ELECTROEXPLOSIVE DEVICE Patent

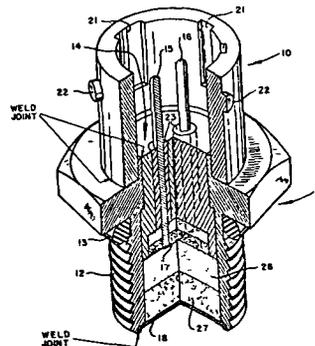
Vincent J Menichelli inventor (to NASA) (JPL) Issued 1 Aug 1978 7 p Filed 8 Nov 1976 Supersedes N77-17258 (15-08 p 1012) Sponsored by NASA

(NASA-Case-NPO-13858-1 NASA-Case-NPO-13859-1 US-Patent-4 103 619 US-Patent-Appl-SN-740153 US-Patent-Class-102-28R) Avail US Patent Office CSCL 19A

An electroexplosive device is presented which employs a header having contact pins hermetically sealed with glass passing through from a connector end of the header to a cavity filled with a shunt layer of a new nonlinear resistive composition and a heat-sink layer of a new dielectric composition having good thermal conductivity and capacity. The nonlinear resistive layer

and the heat-sink layer are prepared from materials by mixing with a low temperature polymerizing resin. The resin is dissolved in a suitable solvent and later evaporated. The resultant solid composite is ground into a powder, press formed into the header and cured (polymerized) at about 250 to 300 F.

Official Gazette of the U S Patent Office



N79-14228* National Aeronautics and Space Administration Pasadena Office Calif

INHIBITED SOLID PROPELLANT COMPOSITION CONTAINING BERYLLIUM HYDRIDE Patent

Wallace W Thompson inventor (to NASA) (JPL) Issued 5 Sep 1978 3 p Filed 5 Aug 1969 Sponsored by NASA

(NASA-Case-NPO-10866-1, US-Patent-4 111,729, US-Patent-Appl-SN-849274, US-Patent-Class-149-19 9, US-Patent-Class-149-19 92, US-Patent-Class-149-20) Avail US Patent and Trademark Office CSCL 211

An object of this invention is to provide a composition of beryllium hydride and carboxy-terminated polybutadiene which is stable. Another object of this invention is to provide a method for inhibiting the reactivity of beryllium hydride toward carboxy-terminated polybutadiene. It was found that a small amount of lecithin inhibits the reaction of beryllium hydride with the acid groups in carboxy terminated polybutadiene.

Official Gazette of the U S Patent and Trademark Office

31 ENGINEERING (GENERAL)

Includes vacuum technology, control engineering, display engineering and cryogenics

N79-10245*# National Aeronautics and Space Administration Pasadena Office Calif

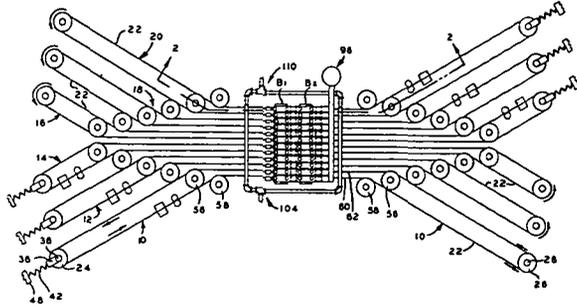
AN IMPROVED SYSTEM FOR SLICING SILICON WAFERS Patent Application

Earl R Collins inventor (to NASA) Filed 16 Oct 1978 17 p (Contract NAS7-100)

(NASA-Case-NPO-14406-1 US-Patent-Appl-SN-951828) Avail NTIS HC A02/MF A01 CSCL 13H

A system is presented for simultaneously slicing from a plurality of silicon boules arranged in side-by-side relation a multiplicity of high-grade wafers for use in the semiconductor industry. The system includes a plurality of band saw blades supported for simultaneous unidirectional displacement along

parallel courses extending through a common cutting station. The blades are provided with serrations the purpose of which is to transport a cutting slurry picked-up at jets for enhancing cutting operation. Each of the blades is supported at the cutting station by a plurality of guides driven in rotation in a manner such that the guides are angularly displaced through 180 degrees during each cutting operation for continuously presenting to the blade regenerated supporting surfaces whereby blade wobble is reduced. NASA



N79-11246* National Aeronautics and Space Administration
Langley Research Center Hampton Va
NOZZLE EXTRACTION PROCESS AND HANDLEMETER FOR MEASURING HANDLE Patent

Vernon L Alley Jr and Austin D McHutton inventors (to NASA)
Issued 1 Aug 1978 13 p Filed 19 Oct 1976 Supersedes
N77-10198 (15 - 01 p 0031)

(NASA-Case-LAR-12147-1 US-Patent-4 103 550
US-Patent-Appl-SN-733825 US-Patent-Class-73-159
US-Patent-Class-73-95) Avail US Patent Office CSCL 13H

Method and apparatus for quantitatively measuring the handle of fabrics and other flexible materials is presented. Handle is that term used to refer to the qualities of drapability flexibility compressibility foldability stretchability pliability etc possessed by fabrics and other flexible materials. In the present invention the handle of a material sample is quantified by measuring the force required to draw the sample through an orifice and expressing the resultant extractive force as a function of test apparatus geometry and the amount of sample drawn through the orifice to arrive at quantitative measure of handle to be defined as handle modulus for the sample in question.

Official Gazette of the U S Patent Office

N79-10246*# National Aeronautics and Space Administration
Pasadena Office Calif

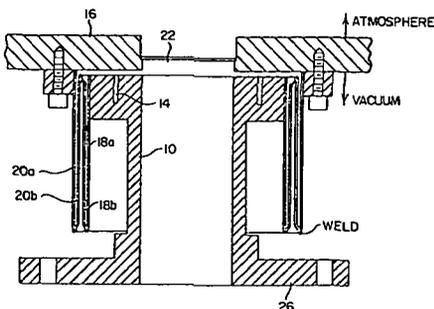
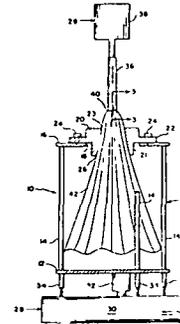
SUPPORT ASSEMBLY FOR CRYOGENICALLY COOLABLE LOW-NOISE CHOKED WAVEGUIDE Patent Application

Frank E McCrea inventor (to NASA) (JPL) Filed 31 Aug 1978
11 p

(Contract NAS7-100)

(NASA-Case-NPO-14253-1 NASA-Case-NPO-14640-1
US-Patent-Appl-SN-938293) Avail NTIS HC A02/MF A01
CSCL 20N

An assembly that has low noise characteristics and low heat transfer for supporting a waveguide through cryogenically cooled space is presented. The novelty of the invention resides in the use of stainless steel tubes to support a waveguide from a mounting plate in the manner described to provide a thermal conduction path of high impedance with such structural rigidity that the waveguide is held with the proper choke gap and in proper alignment. These structures can be used in tandem to support a waveguide through two cooling stages at vastly different temperatures such as 300 K outside 4 K inside and 70 K in the intermediate stage. NASA



N79-11249*# National Aeronautics and Space Administration
Langley Research Center Hampton Va

METHOD AND TOOL FOR MACHINING A TRANSVERSE SLOT ABOUT A BORE Patent Application

Manuel A David-Malig inventor (to NASA) (United Aircraft Corp
Sunnyvale Calif) Filed 17 Oct 1978 11 p Sponsored by
NASA

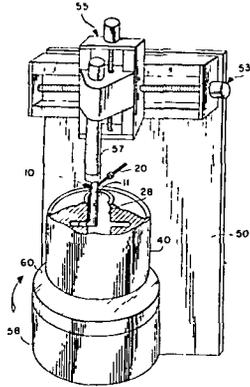
(NASA-Case-LAR-11855-1 US-Patent-Appl-SN-953314) Avail
NTIS HC A02/MF A01 CSCL 13H

A machining tool is described for cutting transverse slots in solid rocket motor casings. The cutting tool mounted on a milling machine is positioned into the bore of a rocket motor by a vertical feed mechanism. The rocket motor mounted on rotating table is rotated as the cutting head being tightly held against

31 ENGINEERING (GENERAL)

shaft by tensioned cable is moved transversely into the wall to cut a slot. Maximum slot depth is reached when the shaft of the tool is in proximity to the wall of the bore. To increase slot depth machining ends the cable is slackened and the tool is backed off to allow the insertion of another spacer. The cable is tightened and the steps of cutting, backing off, and adding spacers are repeated until the desired depth of the slot is reached.

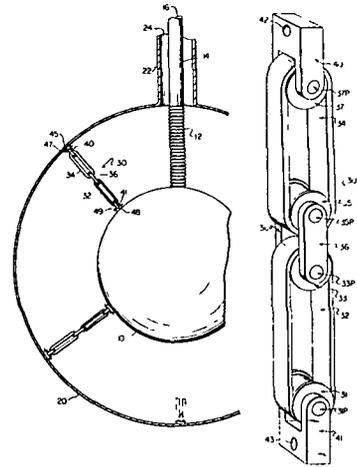
NASA



N79-18087* National Aeronautics and Space Administration Ames Research Center Moffett Field Calif
CRYOGENIC CONTAINER COMPOUND SUSPENSION STRAP Patent Application
 John W. Vorreiter, inventor (to NASA) Filed 22 Aug 1978 13 p
 (NASA-Case-ARC-11157-1 US-Patent-Appl-SN-935827) Avail NTIS HC A02/MF A01 CSCL 20L

A support strap for use in a cryogenic storage vessel for supporting the inner shell from the outer shell with a minimum heat leak is presented. The compound suspension strap is made from a unidirectional fiberglass epoxy composite material with an ultimate tensile strength and fatigue strength which are approximately doubled when the material is cooled to a cryogenic temperature.

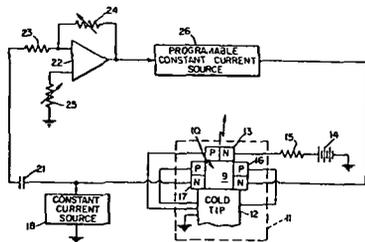
NASA



N79-17029* National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt, Md
THERMAL COMPENSATOR FOR CLOSED-CYCLE HELIUM REFRIGERATOR Patent
 Donald E. Jennings (NAS-NRC, Washington, D.C.) and John J. Hillman, inventors (to NASA) Issued 16 Jan 1979 6 p Filed 30 Sep 1977 Supersedes N78-10326 (16-01, p 0049) (NASA-Case-GSC-12168-1, US-Patent-4,134,447 US-Patent-Appl-SN-838337 US-Patent-Class-165-30 US-Patent-Class-62-514R US-Patent-Class-174-15Ca, US-Patent-Class-250-352) Avail US Patent and Trademark Office CSCL 20L

The wave length of an infrared semiconductor laser diode having an output frequency that is dependent on the diode temperature is maintained substantially constant by maintaining the diode temperature constant. The diode is carried by a cold tip of a closed cycle helium refrigerator. The refrigerator has a tendency to cause the temperature of the cold tip to oscillate. A heater diode and a sensor diode are placed on a thermal heat sink that is the only highly conductive thermal path between the laser diode and the cold tip. The heat sink has a small volume and low thermal capacitance so that the sensing diode is at substantially the same temperature as the heater diode and substantially no thermal lag exists between them. The sensor diode is connected in a negative feedback circuit with the heater diode so that the tendency of the laser diode to thermally oscillate is virtually eliminated.

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

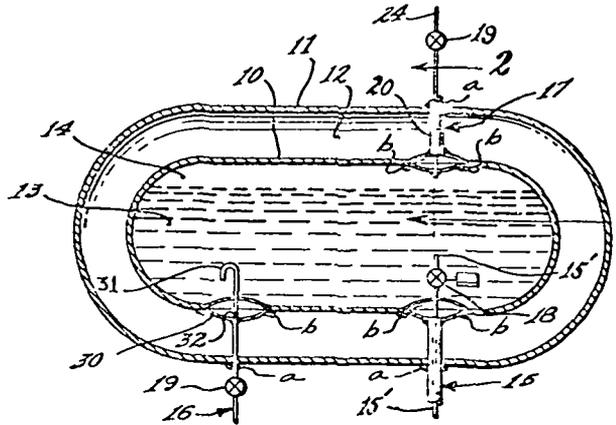
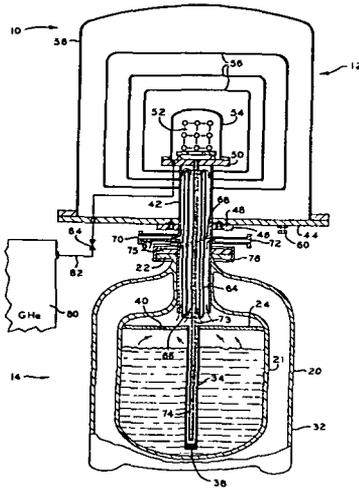


N79-20283* National Aeronautics and Space Administration Pasadena Office Calif
LOW COST CRYOSTAT Patent Application
 James B. Stephens, inventor (to NASA) (JPL) Filed 29 Mar 1979 20 p
 (Contract NAS7-100) (NASA-Case-NPO-14513-1, US-Patent-Appl-SN-025162) Avail NTIS HC A02/MF A01 CSCL 20L

An improved cryostat for use in a low or a substantially gravity-free environment adapted to cool an experiment through the use of helium II, or helium in its super fluid state is described. The cryostat is characterized by interchangeable daughter dewars and helium supply, and a mother dewar connected to a low pressure venting system for converting helium I to a super fluid state for use as a primary cryogen. Each daughter dewar is adapted to be removably mounted in mated relation on the mother dewar and has support for an experiment package a source of helium to be employed as a secondary cryogen, and a heat pipe adapted to be extended into the mother dewar for facilitating cooling of the secondary cryogen. A transfer of heat from the package to the primary cryogen, (via the secondary

cryogen) is accommodated as a film flow of helium II progresses from the heat pipe to the experiment dewar NASA

gas and terminates in a reverse bend to prevent backflow of liquid through the pipe A R H



N79-21226* National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala
METHOD AND APPARATUS FOR PREPARING MULTICONDUCTOR CABLE WITH FLAT CONDUCTORS Patent
 Gerald V Marcell inventor (to NASA) (Sheldahl, Inc Northfield Minn) Issued 2 Dec 1969 4 p Filed 26 Sep 1966 Sponsored by NASA

(NASA-Case-MFS-10946-1, US-Patent-3,481,802
 US-Patent-AppI-SN-581843 US-Patent-Class-156-52) Avail
 US Patent and Trademark Office CSCL 13H

A method and apparatus for preparing flat conductor cable having a plurality of ribbon-like conductors disposed upon and adhesively bonded to the surface of a substrate is described. The conductors are brought into contact with the substrate surface, and while maintained in axial tension on said substrate the combination is seated on a yieldably compressible layer to permit the conductor to become embedded into the surface of the substrate film

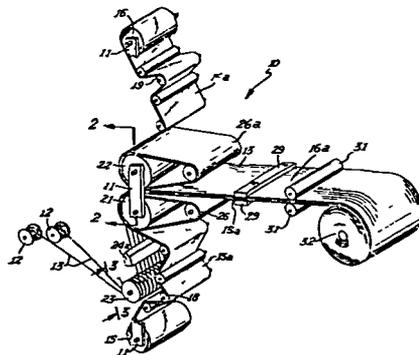
Official Gazette of the U S Patent and Trademark Office

N79-21225* National Aeronautics and Space Administration Lewis Research Center Cleveland, Ohio
LOW HEAT LEAK CONNECTOR FOR CRYOGENIC SYSTEM Patent

Philip D Stelts inventors (to NASA) (Air Products and Chemical Inc Philadelphia) Issued 2 Nov 1965 6 p Filed 1 Oct 1964 Sponsored by NASA

(NASA-Case-XLE-02367-1, US-Patent-3,215,313
 US-Patent-AppI-SN-400857 US-Patent-Class-222-131) Avail
 US Patent and Trademark Office CSCL 20L

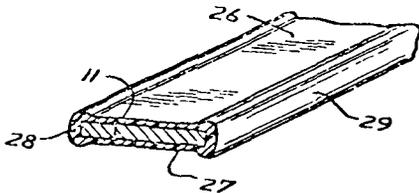
Heat leak from the surrounding atmosphere during fluid transfer from a spaced shell-insulated vessel for storing liquefied gas having an upper gaseous phase is minimized by forming a relatively wide shallow blister on the wall of the vessel at the point of transfer line connection. The shell and the opposed walls of the blister have aligned openings whose common axis passes centrally through the blister and is normal to the surfaces of the vessel and shell. A fluid transfer line conduit passing through the shell opening is in fluid-tight connection with the shell and blister wall. The fluid transfer line confines the fluid in a continuous stream. The blister is filled with a heat insulating material which provides a thermal break between the central wall portions of the blister. A connector at the bottom of the vessel comprises a tube extending between the openings in the blister which projects a short distance within the body of liquefied



31 ENGINEERING (GENERAL)

N79-21227* National Aeronautics and Space Administration Marshall Space Flight Center Huntsville Ala
EDGE COATING OF FLAT WIRES Patent
 Gerald V Marcell (Sheldahl Inc Northfield Minn) Harold I Reynolds (Sheldahl Inc Northfield Minn) and John W Anderson inventors (to NASA) (Sheldahl Inc Northfield Minn) Issued 12 May 1970 4 p Filed 5 Jul 1966 Sponsored by NASA (NASA-Case-XMF-05757-1 US-Patent-3 511 680 US-Patent-Appl-SN-562558 US-Patent-Class-117-43) Avail US Patent and Trademark Office CSCL 13H

An apparatus and technique is described for the coating of the edge surfaces of flat ribbon conductors with an adherent coating of a dielectric insulating material Means for passing the ribbon conductors between a pair of generally axially aligned rollers is provided The edge surfaces of the conductor are disposed adjacent to and generally tangentially to the confronting surfaces of the roller so as to form a fillet of dielectric material along the edge surface of the conductor J M S



32 COMMUNICATIONS

Includes land and global communications communications theory and optical communications

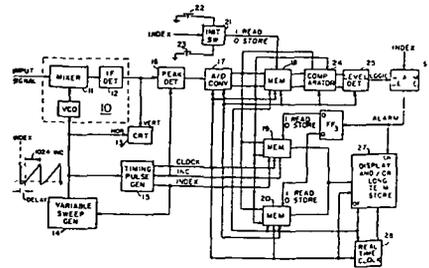
For related information see also 04 Aircraft Communications and Navigation and 17 Spacecraft Communications, Command and Tracking

N79-10262* National Aeronautics and Space Administration Pasadena Office Calif
AUTOMATIC COMMUNICATION SIGNAL MONITORING SYSTEM Patent
 Albert J Bernstein inventor (to NASA) (JPL) Issued 3 Oct 1978 8 p Sponsored by NASA (NASA-Case-NPO-13941-1 US-Patent-4 118 666 US-Patent-Appl-SN-774384 US-Patent-Class-324-77C US-Patent-Class-324 77B US-Patent-Class-307-233R) Avail US Patent Office CSCL 17B

A system is presented for automatic monitoring of a communication signal in the RF or IF spectrum utilizing a superheterodyne receiver technique with a VCO to select and sweep the frequency band of interest A first memory is used to store one band sweep as a reference for continual comparison with subsequent band sweeps Any deviation of a subsequent band sweep by more than a predetermined tolerance level produces an alarm signal which causes the band sweep data temporarily stored in one of two buffer memories to be transferred to long-term store while the other buffer memory is switched

to its store mode to assume the task of temporarily storing subsequent band sweeps

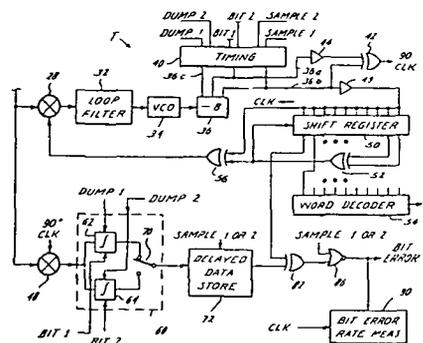
Official Gazette of the U S Patent Office



N79-10263* National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex
BIT ERROR RATE MEASUREMENT ABOVE AND BELOW BIT RATE TRACKING THRESHOLD Patent
 Herbert S Kobayaski Joe Fowler (Lockheed Electronics Co, Houston Tex) and William Kurple inventors (to NASA) Issued 11 Jul 1978 7 p Filed 3 Feb 1977 Supersedes N77-19290 (15 - 10 p 1297) (NASA-Case-MS-C-12743-1 US-Patent-4 100 531 US-Patent-Appl-SN-765167 US-Patent-Class-340-146 1E US-Patent-Class-325-41 US-Patent-Class-340-146 1AX) Avail US Patent Office CSCL 17B

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

Official Gazette of the U S Patent Office



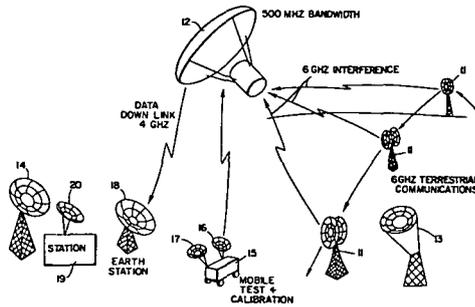
32 COMMUNICATIONS

N79-11265* National Aeronautics and Space Administration
Goddard Space Flight Center Greenbelt Md
**SYSTEMS AND METHODS FOR DETERMINING RADIO
FREQUENCY INTERFERENCE Patent**

Klaus G Johannsen (Hughes Aircraft Co Los Angeles Calif)
Samuel Sabaroff (Hughes Aircraft Co Los Angeles Calif) and
Varice F Henry inventors (to NASA) Issued 10 Oct 1978
19 p Filed 28 Oct 1976 Supersedes N77-12247 (15 - 03
p 0318)
(NASA-Case-GSC-12150-1 US-Patent-4 119 964
US-Patent-Appl-SN-736286 US-Patent-Class-343-17 7
US-Patent-Class-325-4 US-Patent-Class-325-67) Avail US
Patent Office CSCL 20C

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

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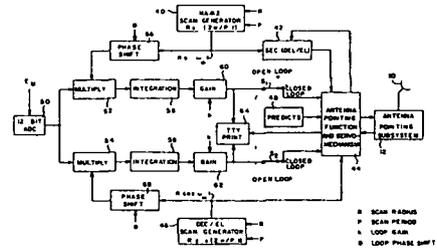
N79-13214* National Aeronautics and Space Administration
Pasadena Office, Calif
**CONICAL SCAN TRACKING SYSTEM EMPLOYING A LARGE
ANTENNA Patent**

John E Ohlson (JPL) and MacGregor S Reid, inventors (to NASA)
(JPL) Issued 24 Oct 1978 6 p Filed 25 Jul 1977 Supersedes
N77-28357 (15 - 19, p 2520) Sponsored by NASA
(NASA-Case-NPO-14009-1, US-Patent-4,122,454,
US-Patent-Appl-SN-818917, US-Patent-Class-343-117R,
US-Patent-Class-343-7 4, US-Patent-Class-343-118) Avail US
Patent and Trademark Office CSCL 17B

A conical scan tracking system for tracking spacecraft and distant radio sources is described. The system detects small sinusoidal modulation in received power from a source that is off target with a frequency equal to a very low scan rate, an amplitude proportional to angular deviation of the source from the target, and a phase directly related to the direction the source is off target. The sinusoid is digitally correlated with inphase and out-of-phase scan sinusoids to obtain azimuth/elevation and hour angle/declination signals which are digitally integrated over

exactly one scan period to obtain correction signals for an antenna pointing subsystem

Official Gazette of U S Patent and Trademark Office



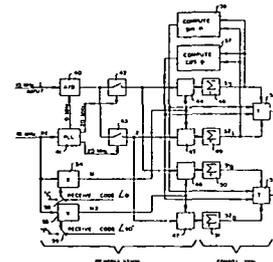
N79-14267* National Aeronautics and Space Administration
Pasadena Office, Calif
DIGITAL DEMODULATOR-CORRELATOR Patent

James W Layland (JPL) Warren L Martin (JPL), Arthur I Zygielbaum (JPL) Richard M Goldstein (JPL), and William P Hubbard inventors (to NASA) (JPL) Issued 5 Sep 1978 14 p Filed 29 Mar 1977 Supersedes N77-24341 (15 - 15, p 1977) Sponsored by NASA

(NASA-Case-NPO-13982-1, US-Patent-4,112,497
US-Patent-Appl-SN-782464, US-Patent-Class-364-728
US-Patent-Class-329-122 US-Patent-Class-343-14,
US-Patent-Class-364-458 US-Patent-Class-364-604) Avail US
Patent and Trademark Office CSCL 17B

An apparatus for demodulation and correlation of a code modulated 10 MHz signal is presented. The apparatus is comprised of a sample and hold analog-to-digital converter synchronized by a frequency coherent 40 MHz pulse to obtain four evenly spaced samples of each of the signal. Each sample is added or subtracted to or from one of four accumulators to or from the separate sums. The correlation functions are then computed. As a further feature of the invention multipliers are each multiplied by a squarewave chopper signal having a period that is long relative to the period of the received signal to foreclose contamination of the received signal by leakage from either of the other two terms of the multipliers

Official Gazette of the U S Patent and Trademark Office



N79-14266* National Aeronautics and Space Administration
Pasadena Office, Calif

AZIMUTH CORRELATOR FOR REAL-TIME SYNTHETIC APERTURE RADAR IMAGE PROCESSING Patent

Wayne E Arens inventor (to NASA) (JPL) Issued 2 Jan 1979
10 p Filed 18 Oct 1977 Supersedes N78-11266 (16 - 02,
p 0180) Sponsored by NASA

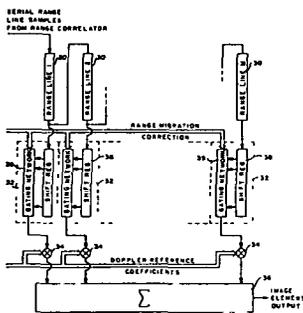
(NASA-Case-NPO-14019-1, US-Patent-4,132,989

US-Patent-AppI-SN-843308, US-Patent-Class-343-5CM,

US-Patent-Class-343-100CL) Avail US Patent and Trademark
Office CSCL 171

An azimuth correlator architecture is defined wherein a number of serial range-line buffer memories are cascaded such that the output stages of all buffer memories together form a complete and unique range bin in the azimuthal dimension at any given time. A range bin is automatically read out of the last stages of the registers in parallel on a range line sample-by-sample basis for subsequent range migration correction and correlation. Range migration correction is performed on the range bins by effectively varying the length of a delay register at the output of each range-line buffer memory. The corrected range bin output from the delay registers is then correlated with a Doppler reference function to form an image element on a real-time basis.

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N79-14272*# National Aeronautics and Space Administration
Pasadena Office, Calif

RADIO FREQUENCY ARRAYING METHOD FOR RECEIVERS Patent Application

Milton H Brockman (JPL) and Mahlon F Easterling, inventors
(to NASA) (JPL) Filed 31 Oct 1978 29 p Sponsored by NASA

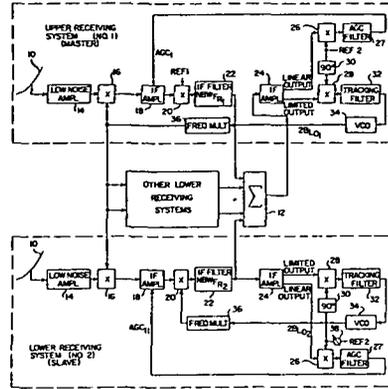
(Contract NAS7-100)

(NASA-Case-NPO-14328-1, NASA-Case-NPO-14579-1,

NASA-Case-NPO-14590-1, US-Patent-AppI-SN-956160) Avail
NTIS HC A03/MF A01 CSCL 17B

A method for arraying receiving systems is presented in order to increase the sensitivity of a receiving facility for coherent radio frequency reception with exemplary applications to high rate telemetry reception, low rate telemetry reception and radiometric tracking as well as a special application to diversity systems using right and left circular, or vertical and horizontal linear transmissions. The basic novelty of the invention resides in RF carrier tracking at the first mixer of all receiving systems slaved to one, and differential RF carrier relative to the master

cancellation in the second IF mixer by phase tracking in the slaved systems separately using the second mixer NASA



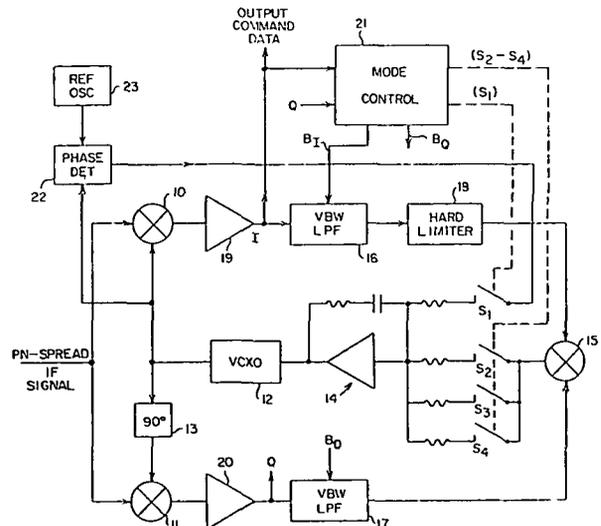
N79-14276*# National Aeronautics and Space Administration
Pasadena Office Calif

DISCRIMINATOR AIDED PHASE LOCK ACQUISITION FOR SUPPRESSED CARRIER SIGNALS Patent Application

Lansing M Carson (JPL) and F Elvin Krasin inventor (to NASA)
(JPL) Filed 15 Dec 1978 13 p Sponsored by NASA

(NASA-Case-NPO-14311-1 US-Patent-AppI-SN-969762) Avail
NTIS HC A02/MF A01 CSCL 17B

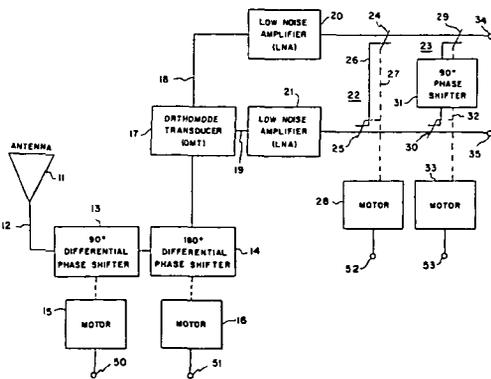
Costas loops and more particularly modifications of the Costas loop are developed in suppressed carrier receivers employed for carrier acquisition and tracking. The novelty resides in the control of the Q-channel low-pass filter to provide a wide bandwidth for carrier acquisition, and in the switch control of the loop filter for the different modes used in the successive steps for PN search and acquisition, carrier acquisition and carrier tracking NASA



N79-18154*# National Aeronautics and Space Administration Langley Research Center Hampton Va
ADAPTIVE POLARIZATION SEPARATION EXPERIMENTS Patent Application

Guy M Pelchat (Harris Corp Ft Lauderdale Fla) George G Rassweiler (Harris Corp Ft Lauderdale, Fla) Anthony J Gianatasio (Harris Corp Ft Lauderdale Fla) and Lock R Young inventors (to NASA) (Harris Corp Ft Lauderdale Fla) Filed 6 Mar 1979 10 p Sponsored by NASA (NASA-Case-LAR-12196-1 US-Patent-Appl-SN-017887) Avail NTIS HC A02/MF A01 CSCL 20N

A broadband adaptively controlled polarization network is described in which two elliptically polarized signals are separated and crosstalk between the two signals is eliminated. The invention consists essentially of a rotatable 90 deg differential phase shifter that receives two elliptically polarized signals and makes one linear. The linear polarized signal is adjusted to vertical polarization by means of a rotatable 180 differential phase shifter. An orthomode transducer then separates the two polarized signals into their respective channels with the vertical linear polarized signal in one channel and an elliptical polarized signal in the other channel. The novel feature of this invention appears to lie in the overall combination of elements to provide a direct analog controlled dual polarization correction network. NASA

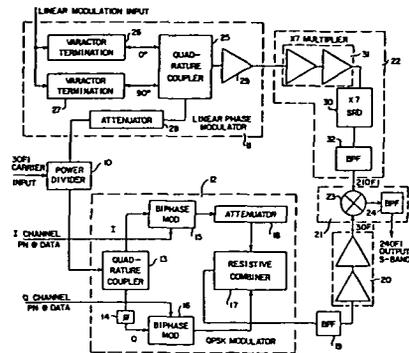


N79-18155*# National Aeronautics and Space Administration Pasadena Office Calif
METHOD AND APPARATUS FOR QUADRIPHASE-SHIFT-KEY AND LINEAR PHASE MODULATION Patent Application

Charles E Hermesmeyer inventor (to NASA) (Motorola Inc Phoenix Ariz) Filed 6 Mar 1979 11 p (Contract JPH-054308) (NASA-Case-NPO-14444-1 US-Patent-Appl-SN-017890) Avail NTIS HC A02/MF A01 CSCL 17B

An S-band modulator capable of providing both linear phase and quadriphase shift key (QPSK) modulation for a transponder in a tracking and data relay satellite system is described. A QPSK modulator and a linear modulator are combined using separate branches out of a power divider for the two modulating functions and combining the outputs of the two branches by an upconverter in order to allow QPSK modulation at a fraction (typically one-eighth) of the transmitter frequency. The linear phase modulator operates at the lower frequency of the QPSK modulator with a multiplier following the linear phase modulator to increase the output of the linear phase modulator to a frequency necessary as an input to the up-converter to produce the desired transmitter output frequency. When the linear modulator is being used the QPSK modulator can be used with a PN code to spread the linear phase modulator but in either case the up-converter produce the same signal as if the QPSK modulator had been placed in series with the linear modulator but because it is in a separate branch operating at a fraction of the transmitter frequency repeatable and precisely controlled QPSK modulator characteristics can be easily attained while in the linear modulator.

a significant amount of multiplication follows to maintain low modulation deviation and good linearity NASA



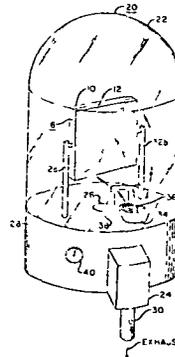
N79-19186* National Aeronautics and Space Administration Pasadena Office, Calif

ELECTROMAGNETIC RADIATION ENERGY ARRANGEMENT Patent

Robert R Lipkis (Thompson Ramo Wooldridge Inc Cleveland) and John E Vehrencamp inventors (to NASA) (Thompson Ramo Wooldridge Inc Cleveland) Issued 16 Mar 1965 4 p Filed 26 May 1961 Sponsored by NASA (NASA-Case-WOO-00428-1, US-Patent-3,173,801, US-Patent-Appl-SN-112999 US-Patent-Class-117-35) Avail US Patent and Trademark Office CSCL 20N

A solar energy collector and infrared energy reflector is described which comprises a vacuum deposited layer of aluminum of approximately 200 to 400 Angstroms thick on one side of a substrate. An adherent layer of titanium with a thickness of between 800 and 1000 Angstroms is vacuum deposited on the aluminum substrate and is substantially opaque to solar energy and substantially transparent to infrared energy.

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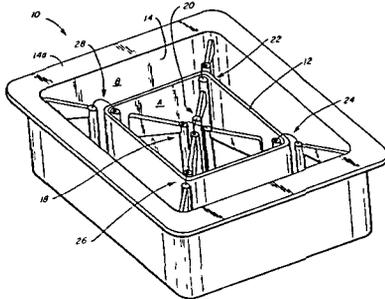
N79-19194*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston Tex
COAXIAL PHASED ARRAY ANTENNA Patent Application

Haynes Ellis, Jr., inventor (to NASA) (Rockwell International Downey, Calif) Filed 17 Oct 1978 30 p Sponsored by NASA (NASA-Case-MSC-16800-1, US-Patent-Appl-SN-953313) Avail NTIS HC A03/MF A01 CSCL 20N

An antenna array for communicating circularly polarized electromagnetic radiation is described. A pair of open ended antenna cavities is coaxially constructed and operates by excitation of linear radiation elements arranged within each of the cavities. A pair of crossed-dipole radiation devices is centered within the cavity and operated by means of a phase-shifting network circuit to transmit as well as receive circularly polarized radiation. Four monopole radiation devices are symmetrically arranged to operate

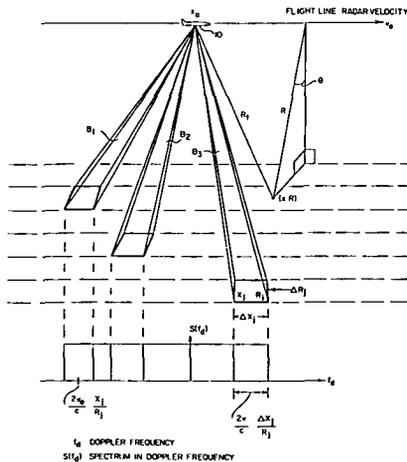
32 COMMUNICATIONS

in the outer cavity in phase quadrature by means of the phase-shifting network circuit to also transmit and receive circularly polarized radiation. Combined operation of the two antenna cavities with a 180 deg phase differential between the fields related to the two cavities provides a broad beam, relatively wide frequency bandwidth communication capability. Particular embodiments disclosed feature a generally square cavity array as well as a circular cavity array. NASA



N79-19195* 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 6 Mar 1979 16 p (Contract NAS7-100)
 (NASA-Case-NPO-14525-1, US-Patent-Appl-SN-017885) Avail NTIS HC A02/MF A01 CSCL 171

A method and apparatus are described for single frequency multibeam imaging of multiple strips of range swath at high range intervals for those applications where it is desirable to cover a range swath much greater than is possible for a given interpulse interval. Data from a single frequency synthetic aperture radar (in which beam parameters are adjusted so that the return from each successive swath is received during successive interpulse periods) are separated in Doppler frequency for the return from each beam at the frequency plane of the processor. Alternatively the image formed by each beam may be spatially separated in the azimuth direction and successively selected by positioning an appropriate slit in the recording plane of the processor. NASA



N79-20296* National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt Md

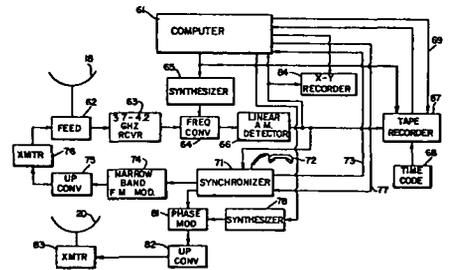
SYSTEM FOR SYNCHRONIZING SYNTHESIZERS OF COMMUNICATION SYSTEMS Patent

Edward A Enriquez, inventors (to NASA) (Hughes Aircraft Co, Los Angeles) and Ronald E Gookin (Hughes Aircraft Co Los Angeles) Issued 20 Feb 1979 18 p Filed 11 Apr 1977 Supersedes N77-22314 (15 - 13, p 1707) Sponsored by NASA

(NASA-Case-GSC-12148-1, US-Patent-4,140,972, US-Patent-Appl-SN-786322, US-Patent-Class-325-58, US-Patent-Class-325-63, US-Patent-Class-343-179) Avail US Patent and Trademark Office CSCL 17B

Frequency synthesizers at first and second stations that communicate with each other via a transmission link having a constant propagation delay time are started and synchronized by transmitting a tone from the first station to the second station via the link. The frequencies derived from the synthesizer at the second station are received at the first station and are combined with the frequencies derived from the synthesizer at the first station to derive a constant beat frequency as the two synthesizers are stepped.

Official Gazette of the U S Patent and Trademark Office

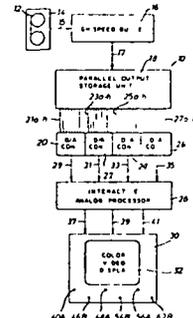


N79-20297* National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex
INTERACTIVE COLOR DISPLAY FOR MULTISPECTRAL IMAGERY USING CORRELATION CLUSTERING Patent
 Richard E Haskell inventor (to NASA) (Oakland Univ, Rochester, Mich) Issued 13 Feb 1979 12 p Filed 8 Sep 1977 Supersedes N77-31583 (15 - 22, p 2957)

(NASA-Case-MSC-16253-1, US-Patent-4,139,862, US-Patent-Appl-SN-831631, US-Patent-Class-358-81, US-Patent-Class-358-109, US-Patent-Class-364-713) Avail US Patent and Trademark Office CSCL 17B

A method for processing multispectral data is provided, which permits an operator to make parameter level changes during the processing of the data. The system is directed to production of a color classification map on a video display in which a given color represents a localized region in multispectral feature space. Interactive controls permit an operator to alter the size and change the location of these regions, permitting the classification of such region to be changed from a broad to a narrow classification.

Official Gazette of the U S Patent and Trademark Office



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

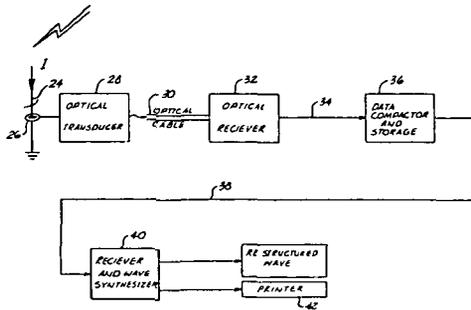
For related information see also 60 Computer Operations and Hardware and 76 Solid-State Physics

N79-10337* National Aeronautics and Space Administration
John F Kennedy Space Center Cocoa Beach Fla
LIGHTNING CURRENT WAVEFORM MEASURING SYSTEM Patent

Ronald J Wojtasinski Jerry C Fuchs (Federal Electric Corp Paramus NJ) and Charles H Grove inventors (to NASA) (Federal Electric Corp Paramus NJ) Issued 11 Jul 1978 6 p Filed 30 Mar 1977 Supersedes N77-21220 (15 - 12 p 1577) (NASA-Case-KSC-11018-1 US-Patent-4 100 487 US-Patent-Appl-SN-782693 US-Patent-Class-324-96, US-Patent-Class-324-72 US-Patent-Class-324-133) Avail US Patent Office CSCL 09A

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

Official Gazette of the U S Patent Office



N79-10338* National Aeronautics and Space Administration
Goddard Space Flight Center Greenbelt Md

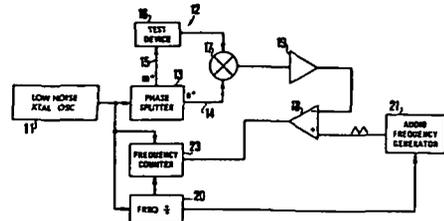
TIME DOMAIN PHASE MEASURING APPARATUS Patent
Victor S Reinhardt inventor (to NASA) Issued 3 Oct 1978
6 p Filed 8 Dec 1977 Supersedes N78-15401 (16 - 06 p 0752)

(NASA-Case-GSC-12228-1 US-Patent-4,118 665 US-Patent-Appl-SN-858764 US-Patent-Class-324-57R US-Patent-Class-324-83D US-Patent-Class-324-85 US-Patent-Class-328-163) Avail US Patent Office CSCL 09A

The phase and/or period stability of a device is determined by connecting the device in one orthogonal arm of a phase detector having a mixer In the other arm is an adjustable variable phase shift device The output of the mixer is fed through an active low pass filter to derive a DC voltage indicative of the phase shift The variable phase device is adjusted so that the DC voltage will nullify the phase shift of the tested device under normal conditions The DC voltage level is converted into a time interval indicative of the phase change of the tested device by determining when the level equals the amplitude of a low frequency ramp voltage The interval between adjacent equality

points can be measured or the period between a reference point on the ramp voltage and the quality be measured

Official Gazette of the U S Patent Office



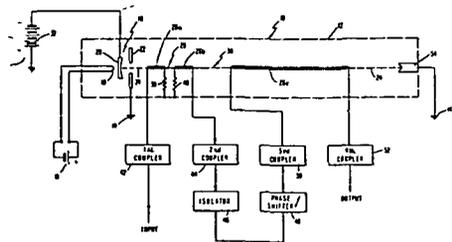
N79-10339* National Aeronautics and Space Administration
Lewis Research Center Cleveland Ohio

TRAVELING WAVE TUBE CIRCUIT Patent
Denis J Connolly inventor (to NASA) Issued 3 Oct 1978
4 p Filed 15 Feb 1977 Supersedes N77-17360 (15 - 08 p 1025)

(NASA-Case-LEW-12013-1 US-Patent-4 118 671 US-Patent-Appl-SN-768795 US-Patent-Class-330-42 US-Patent-Class-315-3 5 US-Patent-Class-315-3 6 US-Patent-Class-301-82) Avail US Patent Office CSCL 09A

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

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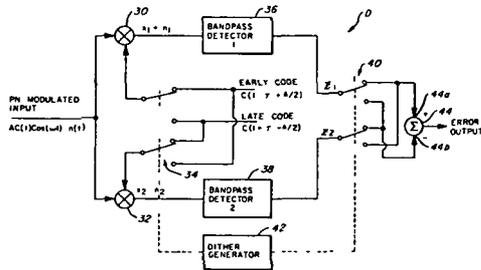
N79-11313* National Aeronautics and Space Administration
Lyndon B Johnson Space Center Houston Tex
**APPARATUS AND METHOD FOR STABILIZED PHASE
DETECTION FOR BINARY SIGNAL TRACKING LOOPS
Patent**

Phillip M Hopkins inventor (to NASA) (Lockheed Electronics Corp Houston Tex) Issued 10 Oct 1978 9 p Filed 8 Dec 1977 Supersedes N78-15331 (16 - 06 p 0742) Sponsored by NASA

(NASA-Case-MSC-16461-1 US-Patent-4 119 926
US-Patent-Appl-SN-858765 US-Patent-Class-331-1A
US-Patent-Class-307-232 US-Patent-Class-328-133
US-Patent-Class-331-14 US-Patent-Class-331-23
US-Patent-Class-331-27) Avail US Patent Office CSCL 09A

Apparatus and method is presented for phase detection in binary signal tracking loops wherein two bandpass detectors are alternately interchanged between electrical connection with two local code reference tracking signals in order to cancel any adverse effect of gain imbalance in the bandpass detectors and direct current offset or drift. The detectors are time shared in multiplex fashion between the two local reference signals.

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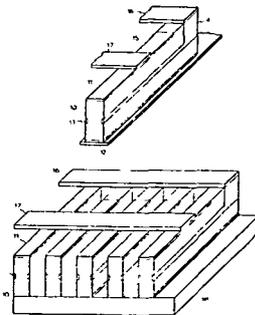
N79-11314* National Aeronautics and Space Administration
Pasadena Office Calif

SPACE-CHARGE-LIMITED SOLID-STATE TRIODE Patent
Alex Shumka inventor (to NASA) (JPL) Issued 14 Jan 1975
7 p Filed 13 Oct 1972 Sponsored by NASA
(NASA-Case-NPO-13064-1 US-Patent-3 860 946

US-Patent-Appl-SN-297436 US-Patent-Class 357-22) Avail
US Patent Office CSCL 09A

A solid-state triode is provided from a wafer of nearintrinsic semiconductor material sliced into filaments of rectangular cross section. Before slicing emitter and collector regions are formed on the narrow sides of the filaments and after slicing gate regions are formed in arrow strips extending longitudinally along the midsections of the wide sides of the filaments. Contacts are then formed on the emitter collector and gate regions of each filament individually for a single filament device or in parallel for an array of filament devices to increase load current.

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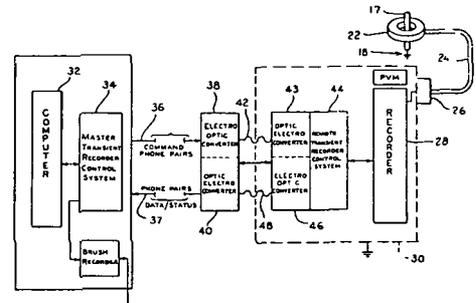


N79-11315* National Aeronautics and Space Administration
John F Kennedy Space Center Cocoa Beach Fla
REMOTE LIGHTNING MONITOR SYSTEM Patent
Carl L Lennon and Thomas O Britt inventors (to NASA) Issued
8 Aug 1978 8 p Filed 29 Mar 1977 Supersedes N77-21319
(15 - 12 p 1577)

(NASA-Case-KSC-11031-1 US-Patent-4 105 966
US-Patent-Appl-SN-782482 US-Patent-Class-324-113
US-Patent-Class-324-102 US-Patent-Class-324-133) Avail US
Patent Office CSCL 09C

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

Official Gazette of the U S Patent Office



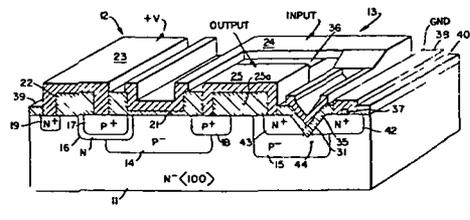
N79-12321* National Aeronautics and Space Administration
Goddard Space Flight Center Greenbelt Md
**COMPLEMENTARY DMOS-VMOS INTEGRATED CIRCUIT
STRUCTURE Patent**

Murzban O Jhabvala inventor (to NASA) Issued 10 Oct 1978
11 p Filed 20 Jul 1977 Supersedes N77-29403 (15 - 20
p 2665)

(NASA-Case-GSC-12190-1 US-Patent-4 119 996,
US-Patent-Appl-SN-817413, US-Patent-Class-357-23
US-Patent-Class-357-22, US-Patent-Class-357-41,
US-Patent-Class-357-45, US-Patent-Class-357-55) Avail
US Patent and Trademark Office CSCL 09A

A high speed CMOS formed on a single semiconductor substrate includes a DMOS having an asymmetric channel and a VMOS with a relatively short channel length. The short channel length of the VMOS is achieved by forming a double diffusion along one edge of a V groove or ion implanting boron into the apex of the V groove and diffusing a single layer to a relatively deep depth along both edges of the groove.

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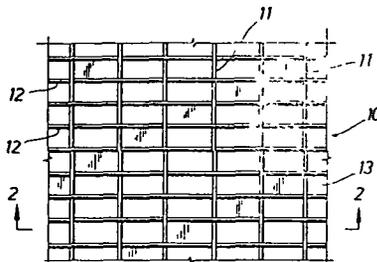


N79-12331* National Aeronautics and Space Administration
Lyndon B Johnson Space Center, Houston Tex
**LIGHTWEIGHT ELECTRICALLY-POWERED FLEXIBLE
THERMAL LAMINATE Patent**

Frederic S Dawn and Dale G Sauers inventors (to NASA) Issued
15 Aug 1978 3 p Filed 14 Jan 1975 Supersedes N75-16635
(13 - 08 p 0865)
(NASA-Case-MS-C-12662-1 US-Patent-4,107,363
US-Patent-Appl-SN-540779 US-Patent-Class-428-109,
US-Patent-Class-428-247 US-Patent-Class-428-258,
US-Patent-Class-428-259) Avail US Patent and Trademark
Office CSCL 09A

Cross-layered woven or unwoven yarns are used to provide an active thermal control mechanism for spacecraft use. One set of yarns is composed of flexible electrically conductive metal fibers which are capable of being resistance heated by the application of voltage. Another set of yarns, nonconductive and flexible provides mechanical strength and precludes the passage of electrical current between the metal yarns by virtue of the spacing between them. A lightweight electrically nonconductive film is bonded to the cross-layered yarns to protect the metal yarns from the elements (minimize electrical shorts from moisture such as rain), to provide additional strength to the fabric, and to prevent conductive loss of heat in nonvacuum applications. The nonconductive film is metalized on its obverse side to provide a more uniform heat load distribution.

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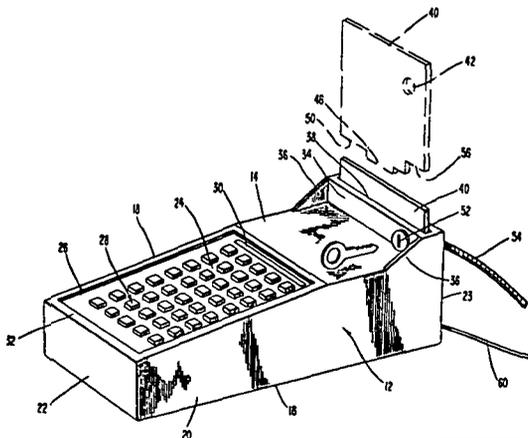


N79-13261* National Aeronautics and Space Administration
Goddard Space Flight Center, Greenbelt, Md
**PORTABLE APPLIANCE SECURITY APPARATUS Patent
Application**

James J Kerley, Jr., inventor (to NASA) Filed 17 Nov 1978
14 p
(NASA-Case-GSC-12399-1, US-Patent-Appl-SN-961831) Avail
NTIS HC A02/MF A01 CSCL 09A

The present invention relates to a heavy gauge case into which a hand held computer or other portable appliance is locked for theft prevention. The case has a rear access opening that is enclosed by a back plate and secured to a desk top or other stationary object by a hold-down cable.

NASA

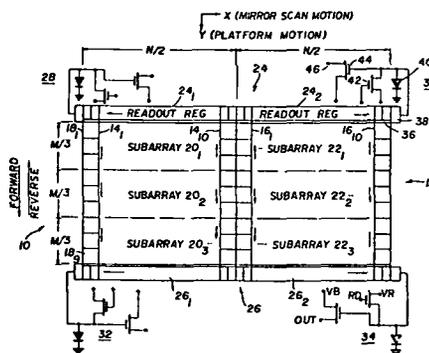


N79-13262* National Aeronautics and Space Administration
Goddard Space Flight Center, Greenbelt, Md
**TIME DELAY AND INTEGRATION DETECTORS USING
CHARGE TRANSFER DEVICES Patent Application**

David H McCann (Westinghouse Electric Corp Baltimore), Marvin H White (Westinghouse Electric Corp , Baltimore), and Alfred P Turly, inventors (to NASA) (Westinghouse Electric Corp , Baltimore) Filed 22 Sep 1978 17 p Sponsored by NASA
(NASA-Case-GSC-12324-1, US-Patent-Appl-SN-945043) Avail
NTIS HC A02/MF A01 CSCL 09A

An imaging system comprising a multichannel matrix array of charge coupled devices (CCD) is described. Sensor cells in each channel are subdivided and operated in discrete intercoupled groups or subarrays with a readout CCD shift register terminating each end of the channels. Clock voltages are applied to the subarrays and are manipulated to selectively cause charge signal flow in each subarray in either direction independent of the other subarrays. The array is divided into six independent subarrays, three on each side of the array such that each channel common to three subarrays is divided into three sections of three sensor cells each. By selective application of four phase clock voltages either one, two or all three of the sections cause charge signal flow in one direction, while the remainder cause charge signal flow in the opposite direction. This creates a form of selective electronic exposure control which provides an effective variable time delay and integration of three, six, or nine sensor cells or integration stages.

NASA



N79-14306* National Aeronautics and Space Administration
John F Kennedy Space Center Cocoa Beach, Fla
LIGHTNING CURRENT DETECTOR Patent

Stephen F Livermore inventor (to NASA) Issued 5 Sep 1978
5 p Filed 22 Sep 1977 Supersedes N78-10435 (16 - 01
p 0065)

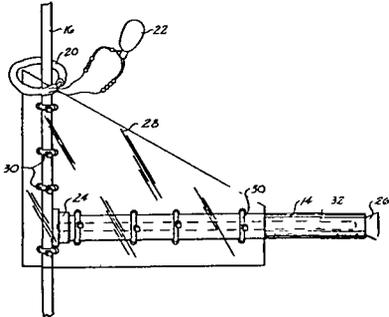
(NASA-Case-KSC-11057-1, US-Patent-4,112,357
US-Patent-Appl-SN-835544, US-Patent-Class-324-72
US-Patent-Class-324-102 US-Patent-Class-324-112
US-Patent-Class-324-113 US-Patent-Class-324-133) Avail US
Patent and Trademark Office CSCL 09A

An apparatus for measuring the intensity of current produced in an elongated electrical conductive member by a lightning strike for determining the intensity of the lightning strike is presented. The apparatus includes an elongated strip of magnetic material that is carried within an elongated tubular housing. A predetermined electrical signal is recorded along the length of said elongated strip of magnetic material. One end of the magnetic

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material is positioned closely adjacent to the electrically conductive member so that the magnetic field produced by current flowing through said electrically conductive member disturbs a portion of the recorded electrical signal directly proportional to the intensity of the lightning strike

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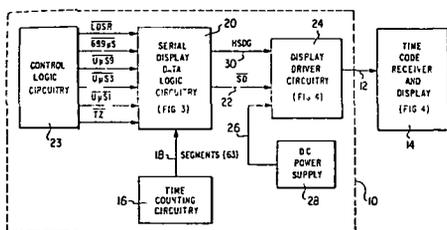
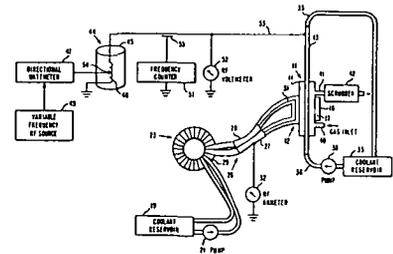
N79-15245* National Aeronautics and Space Administration
Ames Research Center Moffett Field Calif
ELECTRIC DISCHARGE FOR TREATMENT OF TRACE CONTAMINANTS Patent
Daniel L Flamm (Stanford Univ Calif) and Theodore J Wydevon Jr, inventors (to NASA) Issued 19 Dec 1978 9 p Filed 23 May 1977 Supersedes N77-24771 (15 - 15 p 2033) (NASA-Case-ARC-10975-1, US-Patent-4 130 490 US-Patent-Appl-SN-799832, US-Patent-Class-250-531, US-Patent-Class-250-540, US-Patent-Class-250-541) Avail US Patent and Trademark Office CSCL 09C

A radio frequency glow discharge reactor is described for removing trace oxidizable contaminants from an oxygen bearing atmosphere The reaction chamber is defined by an inner metal electrode facing a dielectric backed by an outer conductive electrode In one embodiment a conductive liquid forms the conductor of an outer electrode and cools the dielectric A resonator coupled to a variable radio frequency source generates the high voltages for creating a glow discharge in the chamber at a predetermined pressure whereby the trace contaminants are oxidized into a few simple non-toxic products that may be easily recovered The corresponding process for removal of trace contaminants from an oxygen-bearing atmosphere with high efficiency independent of the concentration level is also disclosed Official Gazette of the U S Patent and Trademark Office

N79-14308*# National Aeronautics and Space Administration
Goddard Space Flight Center Greenbelt Md
A SYSTEM FOR DISPLAYING AT A REMOTE STATION DATA GENERATED AT A CENTRAL STATION AND FOR POWERING THE REMOTE STATION FROM THE CENTRAL STATION Patent Application

James C Perry, inventor (to NASA) Filed 30 Nov 1978 19 p (NASA-Case-GSC-12411-1 US-Patent-Appl-SN-965367) Avail NTIS HC A02/MF A01 CSCL 09C

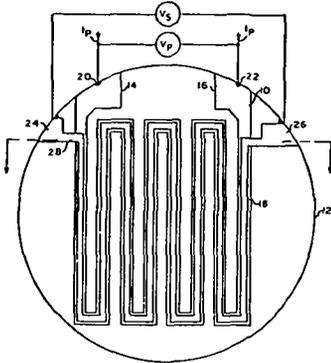
A system having a time display unit remote (up to approximately 200 ft) from a master timing unit is presented The remote display unit is characterized by its simplicity low cost, small size low energy requirements, reliability, and most importantly its lack of a power supply Although the invention is applicable to the remote display of data in general, it is particularly applicable to the remote display of time of day data Novelty is believed to exist in the transmission of the data and power signals from master timing unit to the remote display unit offer a single line and to the simplicity of the circuit design employed to effect not only energization of the components at the remote unit but also to display the transmitted data NASA



N79-17133* National Aeronautics and Space Administration
Marshall Space Flight Center Huntsville Ala
DIRECT CURRENT TRANSFORMER Patent
Shyam M Khanna and Eugene W Urban inventors (to NASA) (NAS-NRC Washington, D C) Issued 16 Jan 1979 4 p Filed 29 Mar 1977 Supersedes N77-20341 (15 - 11, p 1444) (NASA-Case-MFS-23659-1 US-Patent-4 135 127, US-Patent-Appl-SN-782462 US-Patent-Class-323-44F US-Patent-Class-336-DIG 1) Avail US Patent and Trademark Office CSCL 09A

A direct current transformer in which the primary consists of an elongated strip of superconductive material, across the ends of which is direct current potential is described Parallel and closely spaced to the primary is positioned a transformer

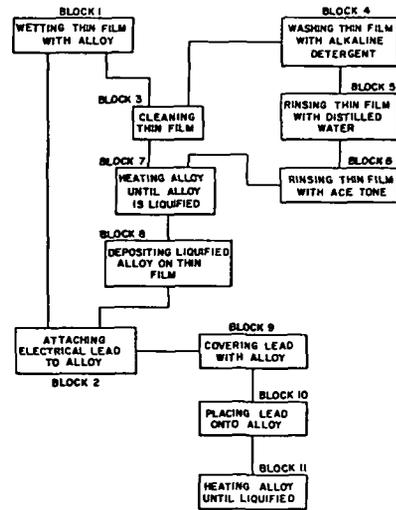
secondary consisting of a thin strip of magnetoresistive material Official Gazette of the U S Patent and Trademark Office



N79-17135*# National Aeronautics and Space Administration
 Goddard Space Flight Center Greenbelt Md
A METHOD AND ALLOY FOR MAKING ELECTRICAL CONNECTIONS TO CONDUCTIVE THIN FILM Patent Application

James A Bass and Edward M Gaddy inventors (to NASA)
 Filed 12 Jan 1979 14 p
 (NASA-Case-GSC-12404-1 US-Patent-Appl-SN-002925) Avail
 NTIS HC A02/MF A01 CSCL 09C

A method for making electrical connections to conductive thin film coatings deposited on a substrate is described. The method involves the steps of wetting a portion of the coating with an indium and metal alloy in which the metal has a resistivity in the range of about 1 50 to 20 microhm-cm at about 20 degrees Celsius and attaching an electrically conductive lead to the alloy. The alloy may include about 90 percent indium and about 10 percent silver or about 50 percent indium and 50 percent tin
 NASA

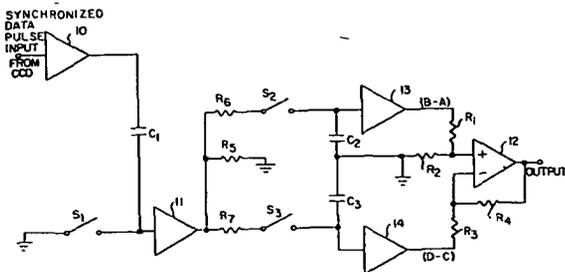


N79-17134*# National Aeronautics and Space Administration
 Pasadena Office Calif

CCD CORRELATED QUADRUPLE SAMPLING PROCESSOR Patent Application

Steve D Gaalema, inventor (to NASA) (JPL) Filed 6 Feb 1979 16 p
 (Contract NAS7-100)
 (NASA-Case-NPO-14426-1 US-Patent-Appl-SN-009889) Avail
 NTIS HC A02/MF A01 CSCL 09C

A correlated quadruple sampling processor for improved signal-to-noise ratio in the output of a charge-coupled device (CCD) is comprised of (1) switching means for momentarily clamping a CCD signal line at a first reference level A before a CCD data pulse and then obtaining a first data sample B with respect to the reference A during a CCD data pulse, and storing the positive sample B-A (2) switching means for momentarily clamping the CCD signal line a second time at the level C during the presence of the CCD data pulse and then obtaining a second data sample D with respect to the reference level C after the CCD data pulse and storing the negative sample D-C and (3) means for obtaining the difference between the stored samples +(B-A) and -(D-C) thus increasing the net signal amplitude by a factor of about 2
 NASA



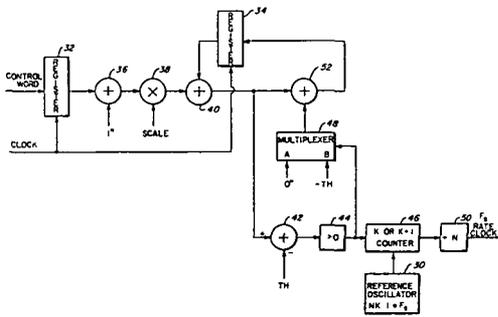
N79-17138*# National Aeronautics and Space Administration
 Lyndon B Johnson Space Center Houston Tex
DIGITAL NUMERICALLY CONTROLLED OSCILLATOR Patent application

Alfred Cellier (TRW Systems Group, Redondo Beach, Calif)
 Douglas C Huey (TRW Systems Group, Redondo Beach, Calif)
 and Lit N Ma, inventors (to NASA) (TRW Systems Group Redondo
 Beach, Calif) 29 Dec 1978 19 p Sponsored by NASA
 (NASA-Case-MSC-16747-1, US-Patent-Appl-SN-974475) Avail
 NTIS HC A02/MF A01 CSCL 09A

The development consists of a numerically controlled oscillator for and method of controlling the frequency and phase of an output signal in response to an input control word indicating an adjustment, which may be either a positive or negative adjustment to be made in the output signal. The translated input control word is then accumulated using a clock which is offset from the desired level. When the threshold is exceeded the phase and thus ultimately the frequency of the output signal is adjusted in a single direction in response to the translated control word.

33 ELECTRONICS AND ELETCRICAL ENGINEERING

The key simplication results from virtual addition of a bias so as to require only carries and never borrows NASA



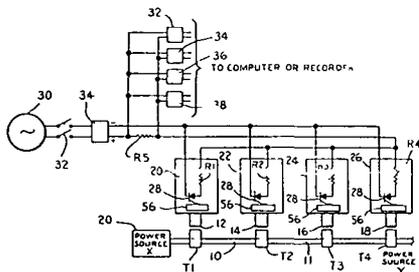
N79-18193* National Aeronautics and Space Administration John F Kennedy Space Center Cocoa Beach Fla APPARATUS INCLUDING A PLURALITY OF SPACED TRANSFORMERS FOR LOCATING SHORT CIRCUITS IN CABLES Patent

Robert L Cason and John J McStay inventors (to NASA) Issued 29 Aug 1978 6 p Filed 8 Jul 1977 Supersedes N77-28394 (15 - 19, p 2525)

(NASA-Case-KSC-10899-1 US-Patent-4 110 683 US-Patent-Appl-SN-814004, US-Patent-Class-324-52, US-Patent-Class-324-127 US-Patent-Class-324-133 US-Patent-Class-340-650 US-Patent-Class-340-664) Avail US Patent and Trademark Office CSCL 09C

A cable fault locator is described for sensing faults such as short circuits in power cables. The apparatus includes a plurality of current transformers strategically located along a cable. Trigger circuits are connected to each of the current transformers for placing a resistor in series with a resistive element responsive to an abnormally high current flowing through that portion of the cable. By measuring the voltage drop across the resistive element, the location of the fault can be determined.

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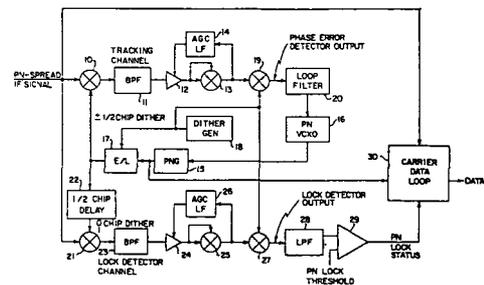
N79-18224*# National Aeronautics and Space Administration Pasadena Office Calif PN LOCK INDICATOR FOR DITHERED PN CODE TRACKING LOOP Patent Application

Lansing M Carson, inventor (to NASA) (Motorola Inc Phoenix, Ariz) Filed 6 Mar 1979 12 p (Contract JPL-954308)

(NASA-Case-NPO-14435-1 US-Patent-Appl-SN-017886) Avail NTIS HC A02/MF A01 CSCL 09A

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

NASA



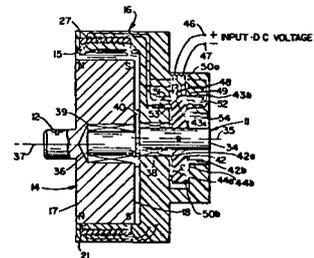
N79-20314* National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt Md ROTARY ELECTRIC DEVICE Patent

Jesse M Madey, inventor (to NASA) Issued 27 Feb 1979 8 p Filed 21 Mar 1977 Supersedes N77-20344 (15 - 11, p 1444)

(NASA-Case-GSC-12138-1 US-Patent-4,142 119, US-Patent-Appl-SN-779871, US-Patent-Class-310-46, US-Patent-Class-310-82, US-Patent-Class-310-231) Avail US Patent and Trademark Office CSCL 09C

An electric motor is described with a low speed shaft that rotates at a speed much slower than the speed of a high speed shaft. It is comprised of a stator having a cylindrical bore with a longitudinal axis and a rotor that carries the low speed shaft which rotates in the bore eccentrically about the axis. There is contact and no magnetic gap between a relatively small portion of the rotor periphery and the periphery of the bore. A magnetic field, rotating at the speed of the high speed shaft is applied to the periphery of the bore. The field has longitudinally extending magnetic field components of opposite polarity so that around approximately 180 deg of the bore the field extends in one direction, while around the other 180 deg of the bore the field extends in the opposite direction. The rotor includes permanent magnet pole faces at opposite ends of the bore.

Official Gazette of the U S Patent and Trademark Office



34 FLUID MECHANICS AND HEAT TRANSFER

N79-13268* National Aeronautics and Space Administration
Lewis Research Center, Cleveland, Ohio

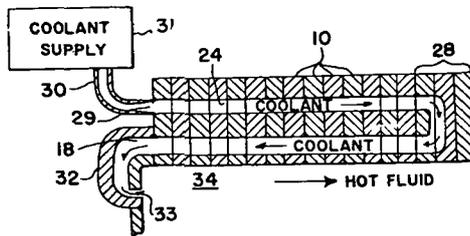
HEAT EXCHANGER Patent

Daniel E Sokolowski inventor (to NASA) Issued 22 Aug 1978
6 p Filed 19 Mar 1975 Supersedes N75-19579 (13 - 11,
p 1244)

(NASA-Case-LEW-12252-1, US-Patent-4 107,919,
US-Patent-Appl-SN-559847 US-Patent-Class-165-169,
US-Patent-Class-60-267 US-Patent-Class-239-127 1) Avail
US Patent and Trademark Office CSCL 20D

A heat exchanger, as exemplified by a rocket combustion chamber, is constructed by stacking thin metal rings having micro-sized openings therein at selective locations to form cooling passages defined by an inner wall, an outer wall and fins. Suitable manifolds are provided at each end of the rocket chamber. In addition to the cooling channel openings, coolant feed openings may be formed in each of rings. The coolant feed openings may be nested or positioned within generally U-shaped cooling channel openings. Compression on the stacked rings may be maintained by welds or the like or by bolts extending through the stacked rings.

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N79-13269* National Aeronautics and Space Administration
Lewis Research Center, Cleveland, Ohio

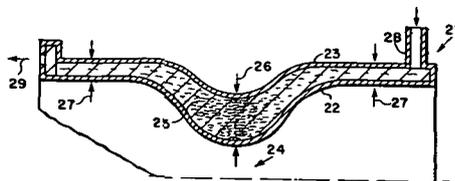
HEAT EXCHANGER AND METHOD OF MAKING Patent

Anthony Fortini and John M Kazaroff, inventors (to NASA) Issued
22 Aug 1978 5 p Filed 19 Mar 1975 Supersedes N75-19580
(13 - 11 p 1244)

(NASA-Case-LEW-12441-1, US-Patent-4,108,241
US-Patent-Appl-SN-559846, US-Patent-Class-165-146,
US-Patent-Class-165-169, US-Patent-Class-60-267,
US-Patent-Class-239-127 1) Avail US Patent and Trademark
Office CSCL 20D

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

Official Gazette of the U S Patent and Trademark Office



N79-20335* National Aeronautics and Space Administration
Pasadena Office, Calif

METHOD AND TURBINE FOR EXTRACTING KINETIC ENERGY FROM A STREAM OF TWO-PHASE FLUID Patent

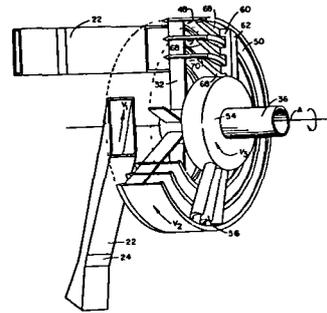
David G Elliott, inventor (to NASA) (JPL) Issued 27 Feb 1979
9 p Filed 31 Oct 1977 Supersedes N78-11398 (16 - 02
p 0198) Sponsored by NASA

(NASA-Case-NPO-14130-1, US-Patent-4,141,219
US-Patent-Appl-SN-847278 US-Patent-Class-60-645

US-Patent-Class-60-649 US-Patent-Class-415-1
US-Patent-Class-415-143) Avail US Patent and Trademark Office
CSCL 20D

An axial flow separator turbine is described which includes a number of nozzles for delivering streams of a two-phase fluid along linear paths. A phase separator which responsively separates the vapor and liquid is characterized by concentrically related annuli supported for rotation within the paths. The separator has endless channels for confining the liquid under the influence of centrifugal forces. A vapor turbine fan extracts kinetic energy from the liquid. Angular momentum of both the liquid phase and the vapor phase of the fluid is converted to torque.

Official Gazette of the U S Patent and Trademark Office



N79-20336* National Aeronautics and Space Administration
Lewis Research Center, Cleveland, Ohio

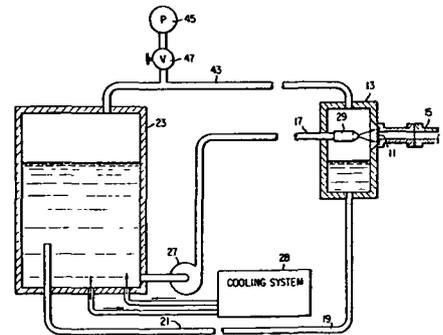
CLOSED LOOP SPRAY COOLING APPARATUS Patent

Donald L Alger, William B Schwab and Edward R Furman
inventors (to NASA) Issued 27 Feb 1979 4 p Filed 31 Aug
1977 Supersedes N77-32434 (15 - 23, p 3075) Division of
US Patent Appl SN-672220, filed 31 Mar 1976 US-Patent-4
068,495

(NASA-Case-LEW-11981-2, US-Patent-4,141,224
US-Patent-Appl-SN-829315, US-Patent-Class-62-514R
US-Patent-Class-62-268 US-Patent-Class-62-376,
US-Patent-Class-250-352 US-Patent-Class-313-22
US-Patent-Class-313-35, US-Patent-Appl-SN-672220,
US-Patent-4,068 495) Avail US Patent and Trademark Office
CSCL 20D

A closed loop apparatus for jet spraying coolant against the back of a radiation target is described. The coolant is circulated through a closed loop with a bubble of inert gas being maintained around the spray. Mesh material is disposed between the bubble and the surface of the liquid coolant which is below the bubble at a predetermined level. In a second arrangement no inert gas is used; the bubble consists of vapor produced when the coolant is sprayed against the target.

Official Gazette of the U S Patent and Trademark Office

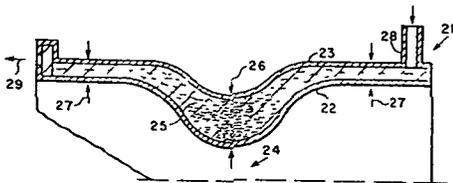


N79-21313* National Aeronautics and Space Administration
Lewis Research Center, Cleveland Ohio
A HEAT EXCHANGER AND METHOD OF MAKING Patent
Application

A Fortini and John M Kazaroff, inventors (to NASA) Filed
30 Nov 1977 14 p
(NASA-Case-LEW-12441-2 US-Patent-Appl-SN-856462) Avail
NTIS HC A02/MF A01 CSCL 20D

A heat exchanger of increased effectiveness is described 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 A specific use is to provide a method of making a rocket chamber with maximum heat transfer at the throat area where inner wall temperatures are the highest

NASA



N79-10390* National Aeronautics and Space Administration
Langley Research Center Hampton Va
PSEUDO CONTINUOUS WAVE INSTRUMENT Patent

Joseph S Heyman inventor (to NASA) Issued 3 Oct 1978
6 p Filed 8 Dec 1977 Supersedes N78-17821 (16 - 8
p 1078)

(NASA-Case-LAR-12260-1 US-Patent-4 117 731
US-Patent-Class-73-579 US-Patent-Class-73-589) Avail US
Patent Office CSCL 14B

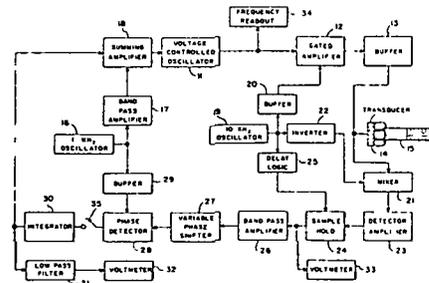
Acoustic properties and their changes in a sample of liquid gas plasma or solid are measured by applying a variable frequency source to the sample by means of a transducer to produce sound waves within the sample The application of the variable frequency source to the sample is periodically interrupted for a short duration Means are connected to the transducer for receiving the resulting acoustic signals during the interruptions for producing a control signal indicative of a difference in the frequency of the output of the variable frequency source and the frequency of a mechanical resonant peak in the sample The control signal is applied to the variable frequency source to maintain its output frequency at the frequency of the mechanical resonant peak The change in frequency of the variable frequency source indicates the shift in frequency of the mechanical resonant peak and the amplitude of the acoustic signals indicates the attenuation of the acoustic signals in the sample

Official Gazette of the U S Patent Office

35 INSTRUMENTATION AND PHOTOGRAPHY

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

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



N79-10389* National Aeronautics and Space Administration
Marshall Space Flight Center, Huntsville Ala

METHOD OF OBTAINING INTENSIFIED IMAGE FROM DEVELOPED PHOTOGRAPHIC FILMS AND PLATES Patent

Barbara S Askins inventor (to NASA) Issued 18 Jul 1978
8 p Filed 9 Jun 1976 Supersedes N76-26449 (14 - 17
p 2189)

(NASA-Case-MFS-23461-1 US-Patent-4 101 780
US-Patent-Appl-SN-694406 US-Patent-Class-250-475
US-Patent-Class-96-27R, US-Patent-Class-96-60R
US-Patent-Class-252-301 1R US-Patent-Class-252-301 16)
Avail US Patent Office CSCL 14E

A method is explained of obtaining intensified images from silver images on developed photographic films and plates The steps involve converting silver of the developed film or plate to a radioactive compound by treatment with an aqueous alkaline solution of an organo-S35 compound placing the treated film or plate in direct contact with a receiver film which is then exposed by radiation from the activated film and developing and fixing the resulting intensified image on the receiver film

Official Gazette of the U S Patent Office

N79-10391* National Aeronautics and Space Administration
Pasadena Office Calif

SURFACE ROUGHNESS MEASURING SYSTEM Patent

Atul Jain inventor (to NASA) (JPL) Issued 18 Jul 1978 15 p
Filed 24 Nov 1976 Supersedes N77-17325 (15 - 08 p 1020)
Sponsored by NASA

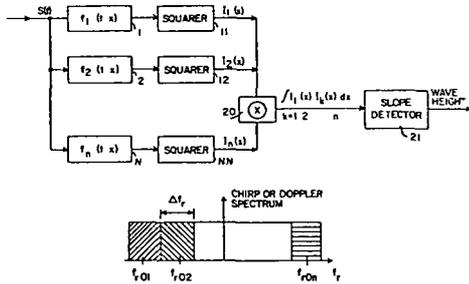
(NASA-Case-NPO-13862-1 US-Patent-4 101 891
US-Patent-Appl-SN-744577 US-Patent-Class-343-17 2PC,
US-Patent-Class-343-5CM US-Patent-Class-343-5W
US-Patent-Class-324-77K) Avail US Patent Office CSCL
14B

Significant height information of ocean waves or peaks of rough terrain is obtained by compressing the radar signal over different widths of the available chirp or Doppler bandwidths and cross-correlating one of these images with each of the others Upon plotting a fixed (eg zero) component of the cross-correlation values as the spacing is increased over some empirically determined range the system is calibrated To measure height with the system a spacing value is selected and a cross-correlation value is determined between two intensity images at a selected frequency spacing The measured height is the slope of the cross-correlation value used Both electronic and optical radar

35 INSTRUMENTATION AND PHOTOGRAPHY

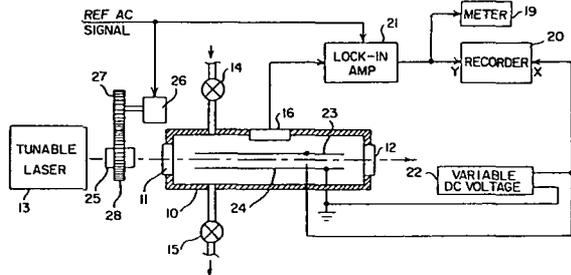
signal data compressors and cross-correlations are disclosed for implementation of the system

Official Gazette of the U S Patent Office



N79-10392*# National Aeronautics and Space Administration Pasadena Office Calif
STARK CELL SPECTROPHONE WITH POLARIZATION MODULATION Patent Application
 Michael J Kavaya (JPL) and Jack S Margolis inventors (to NASA) (JPL) Filed 29 Sep 1978 13 p
 (Contract NAS7-100)
 (NASA-Case-NPO-14362-1 US-Patent-Appl-SN-946995) Avail NTIS HC A02/MF A01 CSCL 14B

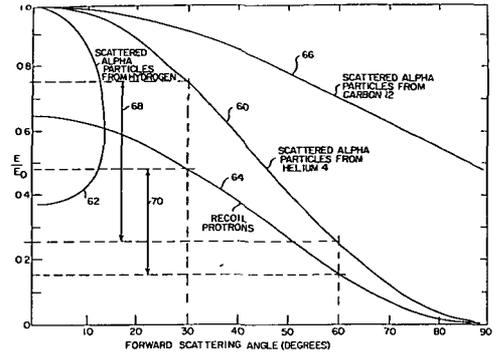
An optoacoustic detector (spectrophone) and more particular a Stark cell spectrophone is presented in which the background noise contributed by the heating effect of the spectrophone windows are to be eliminated. The novelty of the invention resides in rotating the polarization of a laser beam relative to the electric field of a Stark cell spectrophone or vice versa in order to modulate absorption for synchronous detection and thus eliminate heating effects of the laser on the cell windows. NASA



N79-12416*# National Aeronautics and Space Administration Pasadena Office Calif
METHOD AND MEANS FOR HELIUM/HYDROGEN RATIO MEASUREMENT BY ALPHA SCATTERING Patent Application

A Bruce Whitehead (JPL) and Thomas A Trombrello inventors (to NASA) (JPL) Filed 7 Nov 1978 18 p
 (Contract NAS7-100)
 (NASA-Case-NPO-14079-1 US-Patent-Appl-SN-958573) Avail NTIS HC A02/MF A01 CSCL 14B

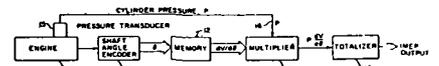
A cylindrically shaped enclosure has a source of alpha particles at one end and detectors mounted in tandem at the other end. Two downward-extending baffles and a blocking shield define a forward-scattering angular range in which scattering products from alpha particle/hydrogen and alpha particle/helium collisions can reach the detector's surface. The thickness of the detectors is sized so that alpha particles resulting from alpha particle helium collisions are absorbed in the first detector and recoil protons resulting from alpha particles/hydrogen collisions pass through the first detector and are absorbed by the second detector. Each scattering product is identified from its ability to penetrate or not penetrate a detection material of predetermined thickness. The output pulses are processed by an electronic processing system. The apparatus could be carried by a planetary probe to one of the outer planets. NASA



N79-14345* National Aeronautics and Space Administration Lewis Research Center, Cleveland Ohio
INDICATED MEAN-EFFECTIVE PRESSURE INSTRUMENT Patent

William J Rice, inventor (to NASA) Issued 5 Sep 1978 5 p
 Filed 29 Sep 1977 Supersedes N77-32461 (15 - 23 p 3080)
 (NASA-Case-LEW-12661-1, US-Patent-4 111,041 US-Patent-Appl-SN-837796 US-Patent-Class-73-115) Avail US Patent and Trademark Office CSCL 14B

An apparatus for measuring indicated mean effective pressure (IMEP) of an internal combustion piston or rotary engine or of an external combustion engine such as a Stirling engine is disclosed. An optical shaft encoder measures crankshaft angle of the engine. Changes in volume with respect to changes in crank angle of one or more cylinders ($dV/d\theta$) is determined either empirically or algebraically from engine geometry and stored in a memory. As the crank angle changes $dV/d\theta$ is read from the memory and multiplied by chamber or cylinder pressure. The product ($P dV/d\theta$) is then added to the total previously accumulated in the cycle. Each time theta changes by an amount equal to delta theta, the process is repeated. At the end of each engine cycle, the total is equal to the IMEP value for that cycle. Official Gazette of the U S Patent and Trademark Office

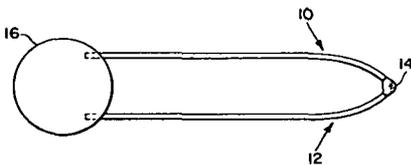


N79-14348* National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio
THERMOCOUPLES OF MOLYBDENUM AND IRIIDIUM ALLOYS FOR MORE STABLE VACUUM-HIGH TEMPERATURE PERFORMANCE Patent

James F Morris, inventor (to NASA) Issued 5 Sep 1978 5 p Filed 21 Nov 1977 Continuation-in-part of abandoned US Patent Appl SN-667929, filed 18 Mar 1976 (NASA-Case-LEW-12174-2, US-Patent-4,111 718, US-Patent-Appl-SN-853679, US-Patent-Class-136-236 US-Patent-Class-136-202 US-Patent-Appl-SN-667929) Avail US Patent and Trademark Office CSCL 14B

Thermocouples providing stability and performance reliability in systems involving high temperatures and vacuums by employing a bimetallic thermocouple sensor are described Each metal of the sensor is selected from a group of metals comprising molybdenum and iridium and alloys containing only those two metals The molybdenum, iridium thermocouple sensor alloys provide bare metal thermocouple sensors having advantageous vapor pressure compatibility and performance characteristics The compatibility and physical characteristics of the thermocouple sensor alloys result in improved emf, temperature properties and thermocouple hot junction performance

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N79-14347* National Aeronautics and Space Administration Langley Research Center, Hampton, Va

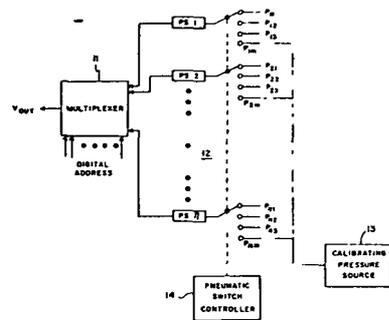
ELECTRONICALLY SCANNED PRESSURE SENSOR MODULE WITH IN SITU CALIBRATION CAPABILITY Patent

Chris Gross, inventor (to NASA) Issued 5 Sep 1978 10 p Filed 22 Sep 1977 Supersedes N78-11370 (16 - 02, p 0193) (NASA-Case-LAR-12230-1 US-Patent-4,111 058, US-Patent-Appl-SN-835628, US-Patent-Class-73-714 US-Patent-Class-73-4R, US-Patent-Class-73-147, US-Patent-Class-73-721 US-Patent-Class-73-756) Avail US Patent and Trademark Office CSCL 14B

This high data rate pressure sensor module helps reduce energy consumption in wind tunnel facilities without loss of measurement accuracy The sensor module allows for nearly a two order of magnitude increase in data rates over conventional electromechanically scanned pressure sampling techniques The module consists of 16 solid state pressure sensor chips and signal multiplexing electronics integrally mounted to a four position pressure selector switch One of the four positions of the pressure selector switch allows the in situ calibration of the 16 pressure sensors, the three other positions allow 48 channels (three sets of 16) pressure inputs to be measured by the sensors The small size of the sensor module will allow mounting within many

wind tunnel models thus eliminating long tube lengths and their corresponding slow pressure response

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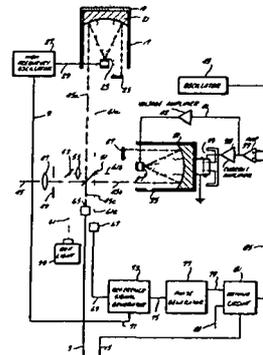


N79-14348 National Aeronautics and Space Administration Pasadena Office, Calif

APPARATUS FOR PROVIDING A SERVO DRIVE SIGNAL IN A HIGH-SPEED STEPPING INTERFEROMETER Patent

Rudolf A Schindler inventor (to NASA) (JPL) Issued 2 Jan 1979 12 p Filed 6 Jun 1977 Supersedes N77-28395 (15 - 19, p 2525) Continuation of abandoned US Patent Appl SN-565162, filed 4 Apr 1975 Sponsored by NASA (NASA-Case-NPO-13569-2, US-Patent-4 132 940, US-Patent-Appl-SN-804035, US-Patent-Class-318-640, US-Patent-Class-318-573, US-Patent-Class-318-594, US-Patent-Appl-SN-565162) Avail US Patent and Trademark Office CSCL 14B

An analog voltage approximately linearly proportional to a desired offset from the present null position of a moving mirror in an interferometer is applied to the mirror moving means As the mirror moves to the next null position as determined by the analog voltage the fringes of a laser reference interference pattern are detected At the occurrence of each fringe the analog voltage is reduced proportionally so that when the next null position is reached, this driving analog is effectively zero A binary up/down counter by its internal count causes a digital/analog converter to supply the analog voltage to the mirror moving means Fringe detection and direction of movement logic cause the binary up/down counter to be decremented from its offset count as the mirror is moved to the new null position Undesirable movement of the mirror due to vibration or other sources causes a correcting drive signal to be applied to the mirror moving means that is proportional to the distance of movement Official Gazette of the U S Patent and Trademark Office



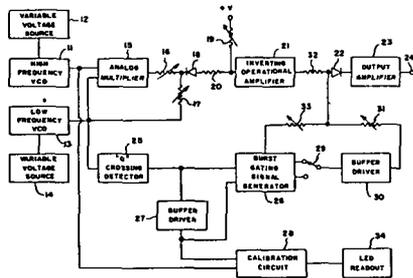
35 INSTRUMENTATION AND PHOTOGRAPHY

N79-14349* National Aeronautics and Space Administration Langley Research Center, Hampton, Va
VERSATILE LDV BURST SIMULATOR Patent
 Otto Youngbluth, Jr inventor (to NASA) Issued 19 Dec 1979 7 p Filed 16 Dec 1977 Supersedes N78-17367 (16 - 08, p 1022)

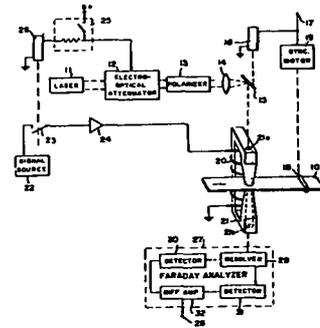
(NASA-Case-Lar-11859-1, US-Patent-4,130,795, US-Patent-Appl-SN-861396, US-Patent-Class-324-57R) Avail US Patent and Trademark Office CSCL 14B

A device for generating burst signals is reported that can be used to determine whether or not a laser Doppler velocimeter is operating properly. A high frequency signal which corresponds to the information frequency of the laser Doppler velocimeter is modulated by a low frequency signal to provide an envelope for the high frequency signal. The high frequency signal is modulated by any modulator means such as, for example, an analog multiplier. The low frequency signal is added to the modulated signal to provide pedestals for the resulting series of burst pulses. The means are provided for selecting different combinations of these burst signals. Also means are provided for making the burst signals asymmetrical as desired. In addition, means are provided for varying the frequencies, and amplitudes of the information, envelope and pedestal frequency signals in the burst signals.

Official Gazette of the U S Patent and Trademark Office



film as it is scanned by the laser beam in the same manner as for recording. A Faraday effect analyzer and photo detector are employed as a transducer for producing an output signal.
 Official Gazette of the U S Patent and Trademark Office



N79-17192* National Aeronautics and Space Administration Lewis Research Center, Cleveland Ohio

FINE PARTICULATE CAPTURE DEVICE Patent
 Victor S Peterson and Robert D Siewert inventors (to NASA) Issued 16 Jan 1979 4 p Filed 8 Nov 1973 Supersedes N74-13199 (12 - 4, p 0420)

(NASA-Case-LEW-11583-1, US-Patent-4,134,744, US-Patent-Appl-SN-414042, US-Patent-Class-55-118, US-Patent-Class-55-122, US-Patent-Class-55-127, US-Patent-Class-55-155, US-Patent-Class-55-241, US-Patent-Class-55-242, US-Patent-Class-55-360, US-Patent-Class-55-407) Avail US Patent and Trademark Office CSCL 14B

To capture fine particulate matter in a gas such as air, a dielectric fluid is directed to the center of whichever face of a rotating disc is exposed to the air flow. The disc is comprised of two or more segments which bear opposite electrostatic potentials. As the dielectric fluid is centrifuged towards the periphery of the rotating disc, the fluid becomes charged to the same potential as the segment over which it is passing. Particulate matter is attracted to the charged segment and is captured by the fluid. The fluid then carries the captured particulate matter to a collection device such as a toroidal container disposed around the periphery of the disc. A grounded electrically-conductive ring may be disposed at the outer periphery of the disc to neutralize the captured particles and the fluid before they enter the container.

Official Gazette of the U S Patent and Trademark Office

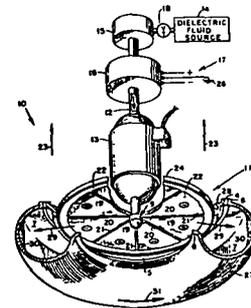
N79-16246* National Aeronautics and Space Administration Pasadena Office, Calif

THERMOMAGNETIC RECORDING AND MAGNETIC-OPTIC PLAYBACK SYSTEM Patent

George W Lewicki (JPL) and John E Guisinger, inventors (to NASA) (JPL) Issued 7 Dec 1971 5 p Filed 10 Mar 1969 Sponsored by NASA

(NASA-Case-NPO-10872-1, US-Patent-3,626,114, US-Patent-Appl-SN-805549, US-Patent-Class-179-100 2CH, US-Patent-Class-340-174 1M, US-Patent-Class-346-74MT) Avail US Patent and Trademark Office CSCL 14E

A magnetic recording and magneto-optic playback system is disclosed wherein thermomagnetic recording is employed. A transparent isotropic film is heated along a continuous path by a focused laser beam. As each successive area of the path is heated locally to the vicinity of its Curie point in the presence of an applied magnetic field, a magneto-optic density is established proportional to the magnetic field and fixed in place as the area cools. Once the laser beam moves on to an adjacent area, to play back the recorded data, the intensity of the laser beam is reduced to avoid reaching the vicinity of the Curie point of the



N79-17196* National Aeronautics and Space Administration
Pasadena Office, Calif

COOLED ECHELLE GRATING SPECTROMETER Patent Application

Reinhard Beer inventor (to NASA) (JPL) Filed 31 Oct 1978
16 p Sponsored by NASA

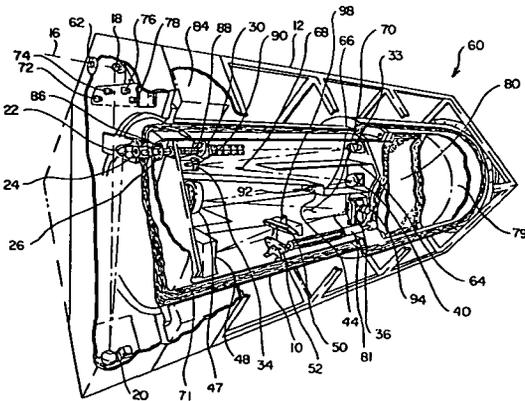
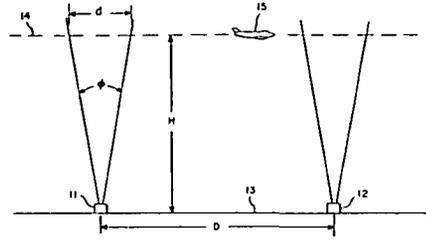
(Contract NAS7-100)

(NASA-Case-NPO-14372-1 US-Patent-Appl-SN-956529) Avail
NTIS HC A02/MF A01 CSCL 14B

A cooled echelle grating spectrometer for detecting wave-lengths between one micron and fifteen microns is described More specifically a spectrometer is disclosed, having a cross-dispersing grating for ordering infrared energy and an echelle grating for further ordering of the infrared energy Means are also disclosed to direct infrared energy to the cross-dispersing grating and then to the echelle grating Ordered radiation from the echelle grating is sensed by a detecting means Means are also provided for cooling the cross-dispersing grating, the echelle grating, and the detecting means so that background radiation can be minimized In a specific embodiment the cross-dispersing grating and echelle grating are in separate enclosed volumes having access to each other through a single intermediate aperture, reflected energy from the cross-dispersing grating being focused so as to pass through the intermediate aperture NASA

zenith crossings as the reference points Height is determined by correlating the speed with the time required to cross the field of view of either of the two cameras

Official Gazette of the U S Patent and Trademark Office



N79-19317* National Aeronautics and Space Administration
Pasadena Office Calif

INTERFEROMETER Patent Application

James B Breckinridge, inventor (to NASA) Filed 30 Nov 1978
16 p

(NASA-Case-NPO-14502-1, US-Patent-Appl-SN-965368) Avail
NTIS HC A02/MF A01 CSCL 14B

An interferometer is presented to measure slight differences in path length of two beams and to enable comparison of the spectrum of an unknown light source with a known source, which is insensitive to tilting One novel feature is the use of largely platelike elements to form a beamsplitter, and with reflector surfaces at the edges of the elements to provide tilt compensation Another feature is that the outer surfaces of the plate-like elements are angled from parallelism with the beamsplitter interface, to avoid the effects from ghost reflections Another feature is the separation of the elements by a thin oil film to permit sliding of one plate relative to the other NASA

N79-18296* National Aeronautics and Space Administration
Langley Research Center Hampton Va

APPARATUS FOR MEASURING AN AIRCRAFT'S SPEED AND HEIGHT Patent

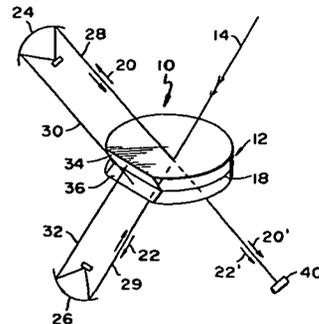
William R Young and Charles W Stump inventors (to NASA)
Issued 23 Jan 1979 7 p Filed 9 Mar 1978 Supersedes
N78-22115 (16 - 13 p 1667)

(NASA-Case-LAR-12275-1 US-Patent-4 135 817

US-Patent-Appl-SN-885065, US-Patent-Class-356-28

US-Patent-Class-358-107) Avail US Patent and Trademark
Office CSCL 14B

An apparatus for measuring aircraft horizontal speed and height above ground without the need for airborne cooperative devices is presented Two ground level TV cameras separated by a measured distance and pointed at zenith are placed in line with the projection of the expected path of the aircraft Speed is determined by measuring the time that it takes the aircraft to travel between the fields of view of the two TV cameras using



35 INSTRUMENTATION AND PHOTOGRAPHY

N79-19319*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex
METHOD FOR APPLYING PHOTOGRAPHIC RESISTS TO OTHERWISE INCOMPATIBLE SUBSTRATES Patent Application

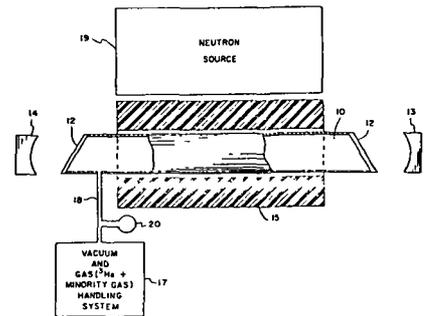
Wolfgang Fuhr inventor (to NASA) (U S Radium, Parsippany, New Jersey) Filed 31 Oct 1978 11 p Sponsored by NASA (NASA-Case-MSC-18107-1, US-Patent-Appl-SN-956168) Avail NTIS HC A02/MF A01 CSCL 14E

An improved method for applying photographic resists to otherwise incompatible substrates, such as a baking enamel paint surface, is described. The uncoated enamel paint surface is coated with noncuring lacquer which is in turn, coated with a partially cured lacquer. The noncuring lacquer adheres to the enamel and a photo resist material will satisfactorily adhere to the partially cured lacquer. Once normal photo etching techniques are employed the lacquer coats are easily removed from the enamel leaving the photo etched image. This invention is particularly applicable to preparation of edge lighted instrument panels. A coat of uncoated enamel is placed over the cured enamel followed by the lacquer coats and the photo resists, which are exposed and developed in the normal way. Once the uncoated enamel is cured, the lacquer coats are removed leaving an etched panel. NASA

N79-18307* National Aeronautics and Space Administration Langley Research Center Hampton Va
VOLUMETRIC DIRECT NUCLEAR PUMPED LASER
 Nelson W Jalufka Frank Hohl Russell J DeYoung (Vanderbilt Univ Nashville Tenn) and Michael D Williams, inventors (to NASA) 29 Aug 1978 7 p Filed 19 Apr 1977 2 Supersedes N77-21424 15 - 12 p 1591
 (NASA-Case-LAR-12183-1 US-Patent-4 110 703
 US-Patent-Class-788-704 US-Patent-Class-331-94 5P
 US-Patent-Class-331-94 5G) Avail US Patent and Trademark Office CSCL 20E

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

Official Gazette of the U S Patent and Trademark Office



36 LASERS AND MASERS

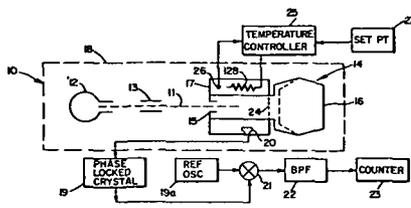
Includes parametric amplifiers

N79-14362* National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt, Md

EXTERNAL BULB VARIABLE VOLUME MASER Patent
 Victor S Reinhardt (Phoenix Corp, McLean, Va) and Peter O Cervenka, inventors (to NASA) (Phoenix Corp, McLean, Va) Issued 5 Dec 1978 10 p Filed 30 Nov 1977 Supersedes N78-15474 (16 - 06, p 0763) Sponsored by NASA (NASA-Case-GSC-12334-1, US-Patent-4 128 814
 US-Patent-Appl-SN-856464, US-Patent-Class-331-94, US-Patent-Class-324-05) Avail US Patent and Trademark Office CSCL 20E

A maser functioning as a frequency standard stable to one part in 10 to the 14th power includes a variable volume, constant surface area storage bulb having a fixed volume portion located in a resonant cavity from which the frequency standard is derived. A variable volume portion of the bulb, exterior to the resonant cavity, has a maximum volume on the same order of magnitude as the fixed volume bulb portion. The cavity has a length to radius ratio of at least 3:1 so that the operation is attained without the need for a feedback loop. A baffle plate, between the fixed and variable volume bulb portions includes apertures for enabling hydrogen atoms to pass between the two bulb portions and is an electromagnetic shield that prevents coupling of the electromagnetic field of the cavity into the variable volume bulb portion.

Official Gazette of the U S Patent and Trademark Office



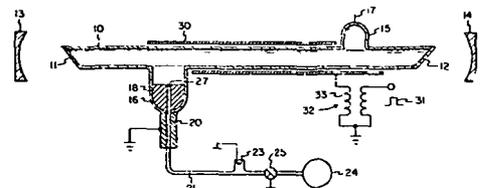
N79-21333* National Aeronautics and Space Administration Marshall Space Flight Center Huntsville, Ala

GAS ION LASER CONSTRUCTION FOR ELECTRICALLY ISOLATING THE PRESSURE GAUGE THEREOF Patent
 Charles E Wood (TRW Inc, Redondo Beach Calif) and Robert S Witte inventors (to NASA) (TRW Inc, Redondo Beach, Calif) Issued 6 May 1975 5 p Filed 10 Sep 1973 Sponsored by NASA

(NASA-Case-MFS-22517-1, US-Patent-3 882 417
 US-Patent-Appl-SN-395895, US-Patent-Class-331-94 5T
 US-Patent-Class-315-108, US-Patent-Class-331-94 5G) Avail US Patent and Trademark Office CSCL 20E

A gas ion laser with a pressure gauge and a gas pressure reservoir connected to the laser through a valve is described. The valve and the pressure gauge are electrically insulated from the laser discharge path by connecting them in series with the cathode of the laser. The laser cathode can be grounded and preferably is a cold cathode although a hot cathode may be used. The cold cathode is provided with a central aperture to which is connected both the pressure gauge and the gas pressure reservoir through the valve. This effectively prevents electric discharges from passing either to the pressure gauge or the valve which would otherwise destroy the pressure gauge.

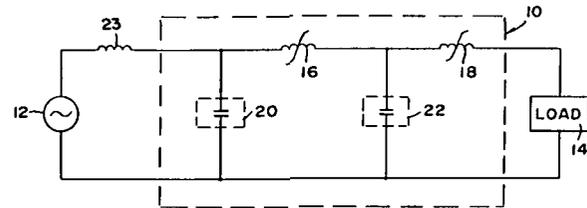
Official Gazette of the U S Patent and Trademark Office



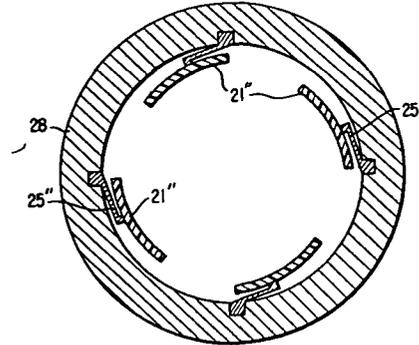
N79-21336* National Aeronautics and Space Administration
Pasadena Office Calif
PULSE SWITCHING FOR HIGH ENERGY LASERS Patent Application

James B Laudenslager (JPL) and Thomas J Pacala, inventors
(to NASA) (JPL) 23 Mar 1979 23 p
(Contract NAS7-100)
(NASA-Case-NPO-14556-1 US-Patent-Appl-SN-023485) Avail
NTIS HC A02/MF A01 CSCL 20E

A pulse forming network for compressing the width and sharpening the rise time of high voltage pulses from relatively slow rise time generators is discussed. The network also provides impedance matching from a high impedance source to a low impedance load for the purpose of efficient energy transfer. Cascaded saturable inductor switches are provided for pulse width compression so that output pulses having rise times of less than one hundred nanoseconds can be obtained. The pulse rise times were determined by the thickness of a high permeability material forming the saturable inductor switch. A means for magnetically biasing the saturable inductor switch so that only pulses from a pulse generator having one polarity are passed and pulses having the opposite polarity are blocked is presented. NASA



beam The bearing is applicable to a wide variety of types of hydrodynamic bearings Official Gazette of the U S Patent Office



N79-10419* National Aeronautics and Space Administration
Hugh L Dryden Flight Research Center Edwards Calif
WIRE STRIPPER Patent

Merle A Economu inventor (to NASA) Issued 3 Oct 1978 5 p
Filed 9 Aug 1976
(NASA-Case-FRC-10111-1 US-Patent-4 117 749
US-Patent-Appl-SN-713027 US-Patent-Class-81-9 5R
US-Patent-Class-30-90 6) Avail US Patent Office CSCL 131

An insulation stripper is described which is especially useful for shielded wire the stripper including a first pair of jaws with blades extending substantially perpendicular to the axis of the wire, and a second pair of jaws with blades extending substantially parallel to the axis of the wire. The first pair of jaws is pressed against the wire so the blades cut into the insulation and the device is turned to form circumferential cuts in the insulation. Then the second pair of jaws is pressed against the wire so the blades cut into the insulation and the wire is moved through the device to form longitudinal cuts that permit easy removal of the insulation. Each of the blades is located within the concave face of a V-block to center the blades on the wire and to limit the depth of blade penetration.

Official Gazette of the U S Patent Office

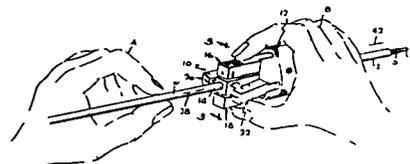
37 MECHANICAL ENGINEERING

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

N79-10418* National Aeronautics and Space Administration
Lewis Research Center, Cleveland, Ohio
CANTILEVER MOUNTED RESILIENT PAD GAS BEARING Patent

Izhak Etsion inventor (to NASA) (NAS-NRC Washington, D C)
Issued 11 Jul 1978 6 p Filed 28 Apr 1977 Supersedes
N77-24496 (15 - 15 p 1998) Sponsored by NASA
(NASA-Case-LEW-12569-1 US-Patent-4,099,799,
US-Patent-Appl-SN-792069 US-Patent-Class-308-5R
US-Patent-Class-308-9, US-Patent-Class-308-121
US-Patent-Class-308-160 US-Patent-Class-308-163,
US-Patent-Class-308-172 US-Patent-Class-308-DIG 1) Avail
US Patent Office CSCL 11A

A gas-lubricated bearing is described employing at least one pad mounted on a rectangular cantilever beam to produce a lubricating wedge between the face of the pad and a moving surface. The load-carrying and stiffness characteristics of the pad are related to the dimensions and modulus of elasticity of the

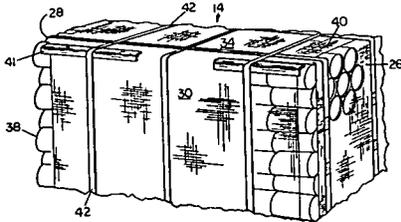


N79-10420* National Aeronautics and Space Administration
Pasadena Office Calif
VEHICULAR IMPACT ABSORPTION SYSTEM Patent

Albert C Knoell (JPL) and Abraham H Wilson inventors (to NASA) (JPL) Issued 3 Oct 1978 5 p Filed 19 Aug 1977
Supersedes N77-31501 (15 - 22 p 2946) Sponsored by NASA
(NASA-Case-NPO-14014-1 US-Patent-4 118 014
US-Patent-Appl-SN-826204 US-Patent-Class-256-1
US-Patent-Class-188-1C US-Patent-Class-256-13 1) Avail US
Patent Office CSCL 13F

37 MECHANICAL ENGINEERING

An improved vehicular impact absorption system characterized by a plurality of aligned crash cushions of substantially cubic configuration is described. Each consists of a plurality of voided aluminum beverage cans arranged in substantial parallelism within a plurality of superimposed tiers and a covering envelope formed of metal hardware cloth. A plurality of cables is extended through the cushions in substantial parallelism with an axis of alignment for the cushions adapted to be anchored at each of the opposite end thereof. Official Gazette of the U S Patent Office



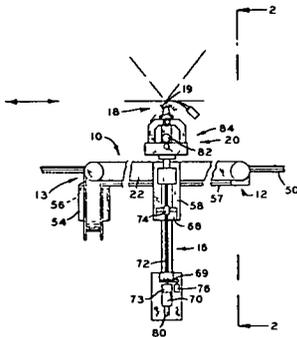
N79-10421* National Aeronautics and Space Administration
Marshall Space Flight Center Huntsville, Ala
COMPUTERIZED SYSTEM FOR TRANSLATING A TORCH HEAD Patent

William A Wall Jr (SCI Systems Inc Huntsville Al) Robert E Ives (SCI Systems Inc Huntsville Al) Miles Melvin Bruce, Jr (SCI Systems Inc, Huntsville Al) Peter Paul Pryor Jr (SCI Systems Inc Huntsville, Al) and Leslie H Gard inventors (to NASA) (SCI Systems Inc Huntsville Al) Issued 3 Oct 1978 11 p Filed 20 May 1977 Supersedes N77-24497 (15 - 15 p 1998)

(NASA-Case-MFS-23620-1 US-Patent-4 118 620
US-Patent-Appl-SN-799023 US-Patent-Class-219-124 32
US-Patent-Class-219-124 2-2 US-Patent-Class-219-125 1
US-Patent-Class-228-8) Avail US Patent Office CSCL 131

The system provides a constant travel speed along a contoured workpiece. It has a driven skate characterized by an elongated bed with a pair of independently pivoted trucks connected to the bed for support. The trucks are mounted on a contoured track of arbitrary configuration in a mutually spaced relation. An axially extensible torch head manipulator arm is mounted on the bed of the carriage and projects perpendicular from the midportion of the carriage and projects perpendicular from the midportion. The torch head is mounted at its distal end. A real-time computerized control drive subsystem is used to advance the skate along the track of a variable rate for maintaining a constant speed for the torch head tip and to position the torch axis relative to a preset angle to the workpiece.

Official Gazette of the U S Patent Office

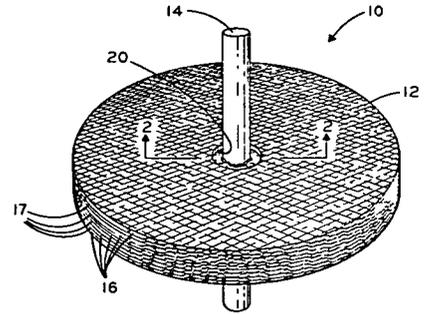


N79-10422* National Aeronautics and Space Administration
Marshall Space Flight Center Huntsville Ala
ROTATABLE MASS FOR A FLYWHEEL Patent
George M Weyler, Jr inventor (to NASA) Issued 4 Jul 1978
4 p Filed 14 Nov 1975 Supersedes N76-13500 (14 - 04, p 0459)

(NASA-Case-MFS-23051-1 US-Patent-4 098 142
US-Patent-Appl-SN-632,111 US-Patent-Class-74-572,
US-Patent-Class-15-230 16 US-Patent-Class-15-230 17
US-Patent-Class-29-125 US-Patent-Class-428-133) Avail US Patent Office CSCL 131

An improved rotatable mass for a flywheel characterized by a plurality of coaxially aligned contiguous disks mounted on a spin shaft is presented. Each disk of the plurality is formed by a plurality of woven fibers disposed in a plane transversely related to an axis of rotation with the fibers of alternate disks being continuous throughout their length. The mid-portion of the fibers of the remaining disks of the plurality is removed for defining annular voids concentrically related to the spin shaft.

Official Gazette of the U S Patent Office

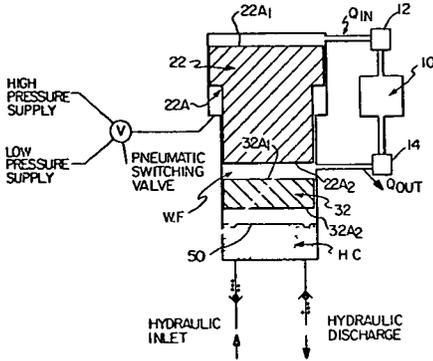


N79-10426*# National Aeronautics and Space Administration
Lewis Research Center, Cleveland Ohio
FREE-PISTON REGENERATIVE HOT GAS HYDRAULIC ENGINE Patent Application

Donald G Beremand, inventor (to NASA) Filed 12 Oct 1978
21 p
(NASA-Case-LEW-12274-1 US-Patent-Appl-SN-950876) Avail
NTIS HC A02/MF A01 CSCL 131

A free piston regenerative hydraulic engine is described including displacer piston which is driven by a high pressure or low pressure gas. Actuation of the displacer piston circulates the working fluid through a heater, a regenerator, and a cooler. This 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 output. The displacer piston may be driven pneumatically, hydraulically or electromagnetically. The

displacer piston and the inertial mass may be positioned on the same side of the diaphragm member or may be separated by the diaphragm member
NASA



N79-11402* National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex
POSITIVE ISOLATION DISCONNECT Patent
Morley V Friedell inventor (to NASA) (Martin Marietta Corp Denver Colo) Issued 1 Aug 1978 8 p Filed 15 Dec 1976 Supersedes N77-15397 (15 - 06 p 0756) Sponsored by NASA

(NASA-Case-MSC-16043-1 US-Patent-4 103 712 US-Patent-Appl-SN-750792 US-Patent-Class-137-637 05 US-Patent-Class 137-614 06 US-Patent-Class-251-149 9 US-Patent-Class-285-326 US-Patent-Class-285-359) Avail US Patent Office CSCL 13K

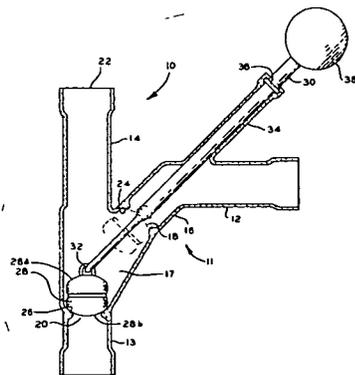
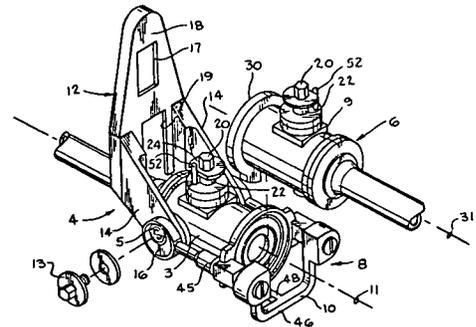
A disconnect composed basically of two halves each consisting of a poppet valve operable to isolate fluid with essentially zero fluid loss is presented. The two halves are coupled together by a quickly releasable coupling which may be either a coupling ring tightened or loosened by a twisting motion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

N79-10427* National Aeronautics and Space Administration Pasadena Office Calif

A QUARTZ BALL VALVE Patent Application
William M Ingle (Motorola, Inc Phoenix Ariz) and Carl Goetz inventors (to NASA) (Motorola Inc Phoenix, Ariz) Filed 31 Aug 1978 12 p
(Contract NAS7-100)

(NASA-Case-NPO-14473-1 US-Patent-Appl-SN-938300) Avail NTIS HC A02/MF A01 CSCL 13K

A ball valve is described particularly suited for use in the handling of highly corrosive fluids. This item is characterized by (1) a valve housing formed of communicating segments of quartz tubing (2) a pair of communicating sockets disposed in coaxial alignment with selected segments of tubing for establishing a pair of inlet ports (3) a ball formed of quartz material supported for displacement between the sockets and (4) a valve actuator with 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
NASA



N79-11403* National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio
FUEL DELIVERY SYSTEM INCLUDING HEAT EXCHANGER MEANS Patent

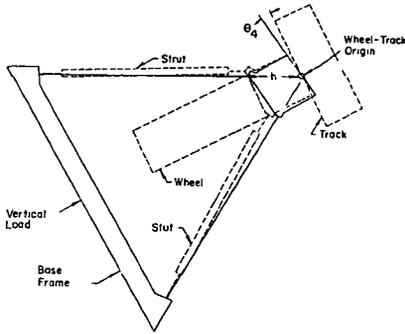
George A Coffinberry inventor (to NASA) (G E Cincinnati Ohio) Issued 8 Aug 1978 6 p Filed 29 Nov 1976 Sponsored by NASA

(NASA-Case-LEW-12793-1 US-Patent-4 104 873 US-Patent-Appl-SN-745766 US-Patent-Class-60-39 28R US-Patent-Class-60 39 08 US-Patent-Class-60-39 66) Avail US Patent Office CSCL 13I

A fuel delivery system is presented wherein first and second heat exchanger means are each adapted to provide the transfer of heat between the fuel and a second fluid such as lubricating oil associated with the gas turbine engine. Valve means are included which are operative in a first mode to provide for flow of the second fluid through both first and second heat exchange

N79-12446* National Aeronautics and Space Administration Pasadena Office Calif
AN IMPROVED SUSPENSION SYSTEM FOR A WHEEL ROLLING ON A FLAT TRACK Patent Application
 Houston D McGinness inventor (to NASA) (JPL) Filed 17 Nov 1978 25 p
 (Contract NAS7-100)
 (NASA-Case-NPO-14395-1, US-Patent-Appl-SN-961833) Avail NTIS HC A02/MF A01 CSCL 13F

A suspension system is described which has particular utility as an azimuth bearing for large track-mounted antennas. The system comprises a wheel frame assembly including at least one uncrowned wheel connected in supporting relation with the assembly and adapted to be seated in rolling engagement with a flat track, a load supporting bed, and a number of flexural struts interconnecting the bed and the assembly. Each of the struts is disposed in an inclined plane passing through the center of the uncrowned wheel surface along the line substantially bisecting the line of contact established between the wheel surface and the track surface and is characterized by a modulus of elasticity sufficient for maintaining the axis of rotation for the wheel in substantial parallelism with the line of contact. NASA

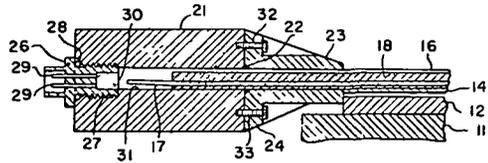


N79-13364* National Aeronautics and Space Administration Langley Research Center Hampton, Va
TOTALLY CONFINED EXPLOSIVE WELDING Patent
 Laurence J Bement inventor (to NASA) Issued 15 Aug 1978 5 p Filed 10 Sep 1973 Supersedes N73-32371 (11 - 23, p 2797) Division of US Patent Appl SN-289048 filed 14 Sep 1972, US-Patent-3,797,098
 (NASA-Case-LAR-10941-2, US-Patent-4,106,687
 US-Patent-Appl-SN-395493, US-Patent-Class-228-2.5,
 US-Patent-Class-29-421E, US-Patent-Class-228-107,
 US-Patent-3,797,098 US-Patent-Appl-SN-289048) Avail US Patent and Trademark Office CSCL 13H

The undesirable by-products of explosive welding are confined and the association noise is reduced by the use of a simple enclosure into which the explosive is placed and in which the explosion occurs. An infrangible enclosure is removably attached to one of the members to be bonded at the point directly opposite the bond area. An explosive is completely confined within the enclosure at a point in close proximity to the member to be bonded and a detonating means is attached to the explosive. The balance of the enclosure, not occupied by explosive, is filled with a shaped material which directs the explosive pressure toward the bond area. A detonator adaptor controls the expansion of the enclosure by the explosive force so that the enclosure at no point experiences a discontinuity in expansion which causes

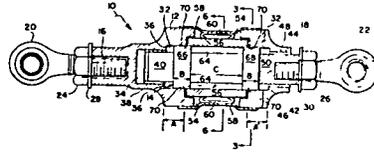
rupture. The use of the technique is practical in the restricted area of a space station.

Official Gazette of the U S Patent and Trademark Office



N79-14382* National Aeronautics and Space Administration Langley Research Center Hampton, Va
LOCKING REDUNDANT LINK Patent
 Frank Henry Bonisch inventor (to NASA) (Sikorsky Aircraft, Stratford Conn) Issued 5 Sep 1978 6 p Filed 7 Mar 1977 Supersedes N77-18134 (15 - 09 p 1130) Sponsored by NASA
 (NASA-Case-LAR-11900-1 US-Patent-4,111,068,
 US-Patent-Appl-SN-775239, US-Patent-Class-74-586,
 US-Patent-Class-403-105 US-Patent-Class-416-61) Avail US Patent and Trademark Office CSCL 13I

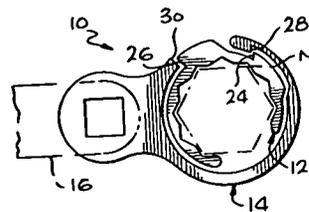
A low-friction axially extensible strut automatically lockable in both tension and compression for use as a secondary load path in helicopter main rotor force measurement systems is described. Official Gazette of the U S Patent and Trademark Office



N79-14383* National Aeronautics and Space Administration Pasadena Office Calif
HIGH-TORQUE OPEN-END WRENCH Patent
 Anthony Giandomenico (JPL), James M Dame (JPL), and Harold Behimer inventors (to NASA) (JPL) Issued 19 Dec 1978 5 p Filed 29 Aug 1977 Supersedes N78-22375 (16 - 13, p 1705) Sponsored by NASA
 (NASA-Case-NPO-13541-1 US-Patent-4,130,032,
 US-Patent-Appl-SN-828262, US-Patent-Class-81-119,
 US-Patent-Class-81-90B, US-Patent-Class-81-180B) Avail US Patent and Trademark Office CSCL 13I

A wrench is described that is usable where limited access normally requires an open-end wrench but which has substantially the high-torque capacity and small radial clearance characteristics of a closed-end wrench. The wrench includes a sleeve forming a nut-engageable socket with a gap in its side, and an adaptor forming a socket with a gap in its side, the adaptor closely surrounding the sleeve and extending across the gap in the sleeve. The sleeve and adaptor have surfaces that become fully engaged when a wrench handle is applied to the adaptor to turn it so as to tighten a nut engaged by the sleeve.

Official Gazette of the U S Patent and Trademark Office



37 MECHANICAL ENGINEERING

N79-14388*# National Aeronautics and Space Administration
Pasadena Office, Calif

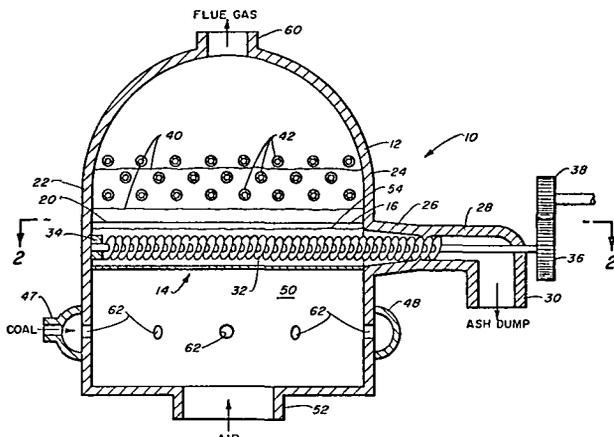
FLUIDIZED BED COAL COMBUSTION REACTOR Patent Application

Philip I Moynihan (JPL) and Donald L Young, inventors (to NASA) (JPL) Filed 15 Dec 1978 13 p
(Contract NAS7-100)

(NASA-Case-NPO-14273-1, US-Patent-Appl-SN-969759) Avail
NTIS HC A02/MF A01 CSCL 13H

A fluidized bed coal reactor which includes a combination nozzle-injector ash-removal unit formed by a grid of closely spaced open channels, each containing a worm screw conveyor, which function as continuous ash removal troughs is presented. A pressurized air-coal mixture is introduced below the unit and is injected through the elongated nozzles formed by the spaces between the channels. The ash build-up in the troughs protects the worm screw conveyors as does the cooling action of the injected mixture. The ash layer and the pressure from the injectors support a fluidized flame holder combustion zone above the grid which heats water in boiler tubes disposed within and/or above the combustion zone and/or within the walls of the reactor.

NASA



N79-17217*# National Aeronautics and Space Administration
Pasadena Office Calif

A PHASE-ANGLE CONTROLLER FOR STIRLING ENGINES

Allan R McDougal inventor (to NASA) (JPL) 31 Jan 1979
34 p

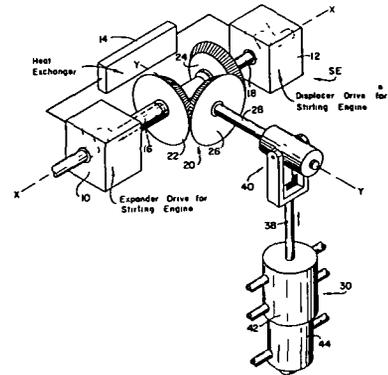
(Contract NAS7-100)

(NASA-Case-NPO-14388-1, US-Patent-Appl-SN-008208) Avail
NTIS HC A03/MF A01 CSCL 10B

Actuators used to control the phase relation between the expander and displacer portions of Stirling engines are proposed. The actuators employ variations in torque requirements of a Stirling engine occurring during each cycle and function as a hydraulic ratchet, whereby minimal external forces are required for varying

phase-angle relations between the cranks for expander and displacer portions of the engine

NASA



N79-17224*# National Aeronautics and Space Administration
Lyndon B Johnson Space Center, Houston Tex

A METHOD OF MAKING HIGH TEMPERATURE SEALS Patent Application

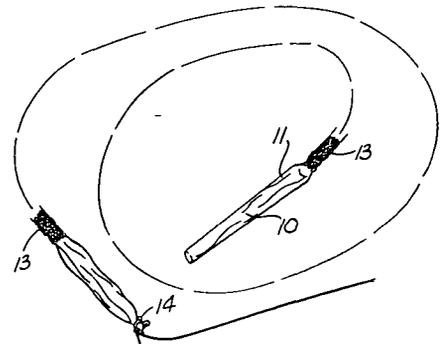
David S Wang (Rockwell Intern Downey Calif) and Aubrey D Warren inventors (to NASA) (Rockwell Intern Downey, Calif)
Filed 15 Dec 1978 10 p

(Contract NAS9-14000)

(NASA-Case-MS-C-16973-1 US-Patent-Appl-SN-696756) Avail
NTIS HC A02/MF A01 CSCL 11A

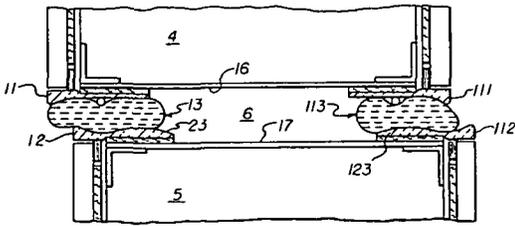
Roughly dimensioned batts of the fragile high temperature insulation material, as saffil, high temperature insulation alumina are wrapped in a plastic polyethylene film to form a sausage casing. Circumferential closure is effected by heat sealing of the film longitudinally as close as reasonably possible to the batting to provide a snug fit of the plastic skin formed over the batting. Drawing through a resilient wire mesh sleeve (spring) of such material as Inconel 750 is then readily accomplished through use of a draw cord attached to an overlapping end portion of the plastic film skin. The plastic skin absorbs the tensile forces produced in the drawing. Subsequent heating to destructively evolve the plastic film leave the insulation fibers unaffected except released for radial expansion in the spring sleeve. The resulting assembly is cross-sectionally deformable and, therefore useful as a door or hatch seal. The method is seen to be also applicable to the drawing of insulation into other restricted spaces, especially if they are of relatively uniform cross-section.

NASA



N79-17226* National Aeronautics and Space Administration
Lyndon B Johnson Space Center Houston Tex
THERMAL BARRIER PRESSURE SEAL Patent Application
John Bellavia, Jr (Rockwell Intern Downey Calif) and John O Kane inventors (to NASA) (Rockwell Intern Downey Calif) Filed 29 Dec 1978 16 p Sponsored by NASA
(NASA-Case-MSC-18134-1 US-Patent-Appl-SN-974472) Avail NTIS HC A02/MF A01 CSCL 11A

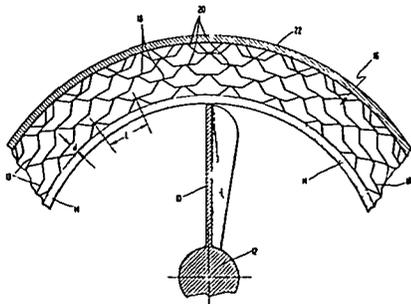
The seal of the present invention is one which performs the dual function of providing a pressure seal and a thermal barrier in a variable space for the extreme pressure and heat conditions encountered for example, in space flight The seal features the ability to roll, compress and expand to maintain a pressure-tight thermal seal for preventing entry of hot gases into spaces between adjacent members of the spacecraft NASA



N79-18318* 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 23 Jan 1979 5 p Filed 27 May 1977 Supersedes N77-24498 (15 - 15 p 1999)
(NASA-Case-LEW-12131-1 US-Patent-4 135 851 US-Patent-Appl-SN-801290 US-Patent-Class-415-174 US-Patent-Class-415-200) 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 protects the rotor blades A compliant backing surrounds the shroud The backing may be made of corrugated sheets or the like with adjacent layers having off-set corrugations, with axes of the folds parallel to the rotor axis The sheets may be bonded together at points of contact by brazing welding or the like In another embodiment a compliant material is covered with a thin ductile layer A mounting fixture surrounds the backing

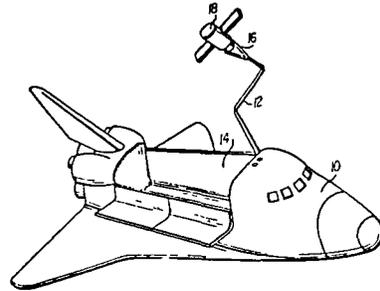
Official Gazette of the U S Patent and Trademark Office



N79-19364* National Aeronautics and Space Administration
Goddard Space Flight Center Greenbelt Md
A COUPLING DEVICE FOR MOVING VEHICLES Patent Application

Arthur A Rudmann inventor (to NASA) 6 Feb 1979 23 p (NASA-Case-GSC-12429-1, US-Patent-Appl-SN-009888) Avail NTIS HC A02/MF A01 CSCL 131

A device is presented for attachment to the arm of a remote manipulator system carried by a first space vehicle for grasping aligning and firmly coupling with a payload in the form of a satellite or other object which is in substantial misalignment and/or rotating with respect to the coupling device The coupling device is characterized by its simplicity, light-weight, small size, low cost and most importantly its reliability Although the device was designed primarily for use in coupling space vehicles smaller versions of the device can conceivably be used on the end of any remote type manipulator arm such as for example those used in handling radioactive materials or in undersea exploration NASA



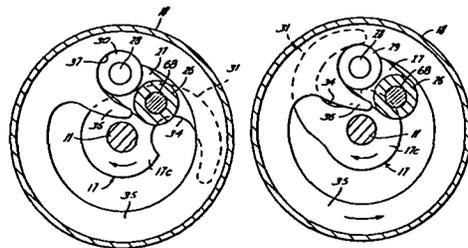
N79-20377* National Aeronautics and Space Administration
Lyndon B Johnson Space Center Houston Tex
SEQUENCING DEVICE UTILIZING PLANETARY GEAR SET Patent

Walter T Appleberry inventor (to NASA) (Rockwell International Downey Calif) Issued 27 Feb 1979 7 p Filed 25 Feb 1977 Supersedes N77-19459 (15 - 10 p 1319) Sponsored by NASA

(NASA-Case-MSC-19514-1, US-Patent-4,141 259, US-Patent-Appl-SN-772 168, US-Patent-Class-74-674 US-Patent-Class-74-705, US-Patent-Class-74-764) Avail US Patent and Trademark Office CSCL 131

A planetary (epicyclic) gear set is provided with a reversible rotating input shaft and individual outputs shafts actuated respectively by the ring gear and planet gear carrier Latch means is positioned to selectively and automatically stop the ring gear or carrier member while releasing the other to provide the desired sequential output operation The output shafts are reversed in sequence and direction of rotation by reversing rotational direction of the input shaft

Official Gazette of the U S Patent and Trademark Office



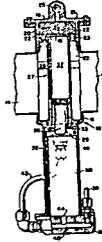
37 MECHANICAL ENGINEERING

N79-21345* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston Tex

WATER SEPARATOR Patent

Winfred F Dunn (Garrett Corp Los Angeles) and Irving G Austin, inventors (to NASA) (Garrett Corp Los Angeles) Issued 28 Apr 1964 4 p Filed 23 Dec 1960 Sponsored by NASA (NASA-Case-XMS-01295-1, US-Patent-3 131,040, US-Patent-Appl-SN-77869, US-Patent-Class-55-159) Avail US Patent and Trademark Office CSCL 131

An apparatus for separating liquids from gases or gaseous fluids is described Features of the apparatus include (1) the collection and removal of the moisture in the fluid is not dependent upon or affected by gravity, (2) all the collected water is cyclically drained from the apparatus irrespective of the attitude of the separator and (3) a fluid actuator is utilized to remove the collected water from the separator JMS



38 QUALITY ASSURANCE AND RELIABILITY

Includes product sampling procedures and techniques and quality control

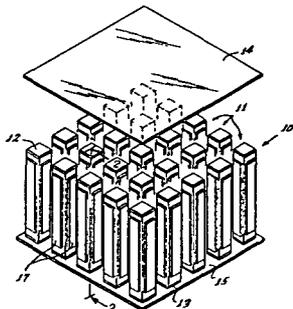
N79-14398* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex

LENGTH MODE PIEZOELECTRIC ULTRASONIC TRANSDUCER FOR INSPECTION OF SOLID OBJECTS Patent

Robert B Thompson, inventor (to NASA) (Rockwell Intern Corp Los Angeles) Issued 31 Oct 1978 7 p Filed 16 Jun 1976 Sponsored by NASA

(NASA-Case-MS-19672-1 US-Patent-4,122,725, US-Patent-Appl-SN-696679, US-Patent-Class-73-632, US-Patent-Class-73-641, US-Patent-Class-73-644, US-Patent-Class-310-326, US-Patent-Class-310-336) Avail US Patent and Trademark Office CSCL 14D

The transducer is constructed from individual transducer elements arranged in an array and configured to exhibit a predominant, longitudinal mode transversely to the array The elements are interconnected through thin flexible sheets Each element is individually damped, and the transducer as a whole is electrically damped through resonance with the clamped capacitance and dissipation Electrical control permits inphase operation of all transducer elements or control with preselected phase differences Official Gazette of the U S Patent and Trademark Office



43 EARTH RESOURCES

Includes remote sensing of earth resources by aircraft and spacecraft, photogrammetry, and aerial photography For instrumentation see 35 Instrumentation and Photography

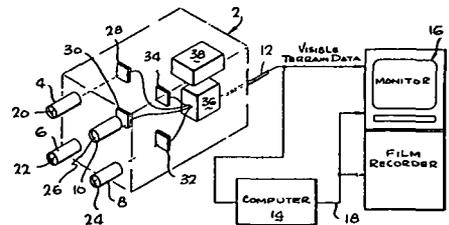
N79-17288* National Aeronautics and Space Administration Pasadena Office Calif

MULTISPECTRAL IMAGING AND ANALYSIS SYSTEM Patent

Alexander F H Goetz (JPL) and Frederick P Landawer Jr, inventors (to NASA) (JPL) Issued 16 Jan 1979 8 p Filed 5 Mar 1976 Supersedes N78-22890 (16 - 15 p 1778) Sponsored by NASA

(NASA-Case-NPO-13691-1 US-Patent-4 134 683, US-Patent-Appl-SN-664091 US-Patent-Class-356-407, US-Patent-Class-250-226 US-Patent-Class-356-300, US-Patent-Class-356-416) Avail US Patent and Trademark Office CSCL 14E

Arrays of charge coupled devices or linear detector arrays simultaneously obtain spectral reflectance data of different wavelengths for a target area Several accommodating a particular bandwidth are individually associated with each array Data from the arrays are read out in parallel and applied to a computer or microprocessor for processing The microprocessor serves to analyze the data in real time and if possible in accordance with hard-wired algorithms The data are then displayed as an image on an appropriate display unit and also recorded for further use The display system may be operationally connected to receive a terrain image such that the target area and the analyzed spectral reflectance data are superimposed and simultaneously displayed Official Gazette of the U S Patent and Trademark Office

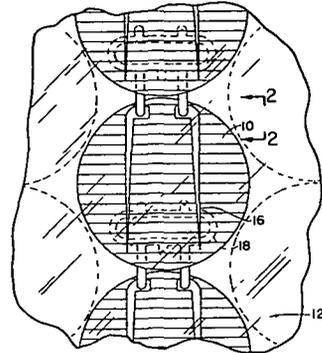


44 ENERGY PRODUCTION AND CONVERSION

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

the cover plate until incident upon the active surface of the solar cell occurs
NASA



N79-11467* National Aeronautics and Space Administration
Lewis Research Center Cleveland Ohio
SOLAR CELLS HAVING INTEGRAL COLLECTOR GRIDS
Patent

John C Evans Jr inventor (to NASA) Issued 1 Aug 1978
7 p Filed 6 Jun 1977 Supersedes N77-24593 (15 - 15 p 2011)

(NASA-Case-LEW-12819-1 US-Patent-4 104 084
US-Patent-Appl-SN-803823 US-Patent-Class-136-89CC
US-Patent-Class 136-89SJ US-Patent-Class-357-15
US-Patent-Class 357-16 US-Patent-Class-357-30
US-Patent-Class 357-65 US-Patent-Class 357 67) Avail US Patent Office CSCL 10A

A heterojunction or Schottky barrier photovoltaic device is described comprising a conductive base metal layer. A back surface field region was formed at the interface between the device and the base metal layer, a transparent conductive mixed metal oxide layer in integral contact with the n-type layer of the heterojunction or Schottky barrier device. A metal alloy grid network was included. An insulating layer prevented electrical contact between the conductive metal base layer and the transparent conductive metal oxide layer.

Official Gazette of the U S Patent Office

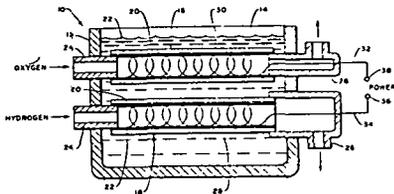
N79-10513* National Aeronautics and Space Administration
Pasadena Office Calif

DUAL MEMBRANE HOLLOW FIBER FUEL CELL AND METHOD OF OPERATING SAME Patent

John D Ingham (JPL) and Daniel D Lawson, inventors (to NASA) (JPL) Issued 11 Jul 1978 5 p Filed 3 Feb 1977 Supersedes N77-19581 (15 - 10 p 1336) Sponsored by NASA (NASA-Case-NPO-13732-1 US-Patent-4 100 331 US-Patent-Appl-SN-765138, US-Patent-Class-429-13, US-Patent-Class-429-41, US-Patent-Class-429-42) Avail US Patent Office CSCL 10A

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

Official Gazette of the U S Patent Office

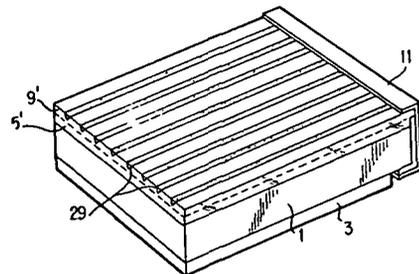


N79-10529*# National Aeronautics and Space Administration
Pasadena Office Calif

AN IMPROVED SOLAR CELL MODULE Patent Application

Neal Franklin Shepard Jr inventor (to NASA) (GE Corp Philadelphia) Filed 29 Sep 1978 10 p Sponsored by NASA (Contract JPL-954607) (NASA-Case-NPO-14467-1 US-Patent-Appl-SN-946994) Avail NTIS HC A02/MF A01 CSCL 10A

A concentrator for a solar cell module with the capability of achieving significant concentration of incidence flux without resorting to the use of ancillary concentration devices is described. The concentrator is adapted to employ repeated internal reflection for effectively concentrating solar energy onto the active surfaces of the solar cells of the module. The solar cell module is characterized by an internally reflective transparent cover plate, a planar surface of incidence, and a diffusively reflective textured surface with at least one silicon solar cell bonded at its active surface to a portion of the textured surface. Thus incident solar flux striking the surface of incidence is re-reflected internally off



N79-11468* National Aeronautics and Space Administration
Lewis Research Center Cleveland Ohio

APPLICATION OF SEMICONDUCTOR DIFFUSANTS TO SOLAR CELLS BY SCREEN PRINTING Patent

John C Evans Jr Henry W Brandhorst Jr George A Mazaris and Larry R Scudder inventors (to NASA) Issued 1 Aug 1978 5 p Filed 20 May 1977 Supersedes N77-24589 (15 - 15 p 2010)

44 ENERGY PRODUCTION AND CONVERSION

(NASA-Case-LEW-12775-1 US-Patent-4 104 091
US-Patent-Appl-SN-799026 US Patent-Class-148-188
US-Patent-Class-29-572 US-Patent-Class-136-89
US-Patent-Class-427-75) Avail US Patent Office CSCL 10A

Diffusants were applied onto semiconductor solar cell substrates using screen printing techniques. The method was applicable to square and rectangular cells and can be used to apply dopants of opposite types to the front and back of the substrate. Then simultaneous diffusion of both dopants can be performed with a single furnace pass.

Official Gazette of the U S Patent Office

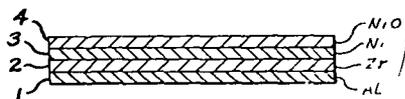
N79-11469* National Aeronautics and Space Administration
Marshall Space Flight Center Huntsville Ala

METHOD FOR MAKING AN ALUMINUM OR COPPER SUBSTRATE PANEL FOR SELECTIVE ABSORPTION OF SOLAR ENERGY Patent

Marion L Roberts Max H Sharpe and Albert C Krupnick inventors (to NASA) Issued 1 Aug 1978 7 p Filed 31 Aug 1977 Supersedes N77-31610 (15 - 22 p 2960)
(NASA-Case MFS-23518 1 US-Patent-4 104 134
US-Patent Appl-SN-829390 US-Patent Class-204-37R
US-Patent-Class-204-32 US-Patent-Class-204-33
US-Patent-Class-204-38B) Avail US Patent Office CSCL 10A

A panel is described for selectively absorbing solar energy comprising an aluminum substrate. A zinc layer was covered by a layer of nickel and an outer layer of solar energy absorbing nickel oxide or a copper substrate with a nickel layer. A layer of solar energy absorbing nickel oxide distal from the copper substrate was included. A method for making these panels is disclosed.

Official Gazette of the U S Patent Office



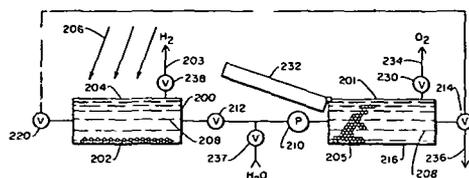
N79-11470* National Aeronautics and Space Administration
Pasadena Office Calif

SOLAR PHOTOLYSIS OF WATER Patent

Porter R Ryason inventor (to NASA) (JPL) Issued 8 Aug 1978 7 p Filed 30 Sep 1977 Supersedes N78-11500 (16 - 02 p 0212) Sponsored by NASA
(NASA-Case-NPO-14126-1 US-Patent-4 105 517
US-Patent-Appl-SN-838336 US-Patent-Class-204-157 1R
US-Patent-Class-250-527) Avail US Patent Office CSCL 10A

A cyclic process is described for the solar photolysis of water including a first stage in which water is reduced in the presence of a Eu^{+2} photooxidizable reagent producing hydrogen and spent oxidized Eu^{+3} reagent. The spent reagent Eu^{+3} is reduced by means of a transition metal ligand complex reductant RuL^{+3} in a photoexcited state such as a ruthenium pyridyl complex. Due to competing reactions between the photolysis and regeneration products the photooxidation reaction must be separated from the regeneration in space and time by supporting the reagent and/or the reductant on solid supports and utilizing pH wavelength and flow control to maximize hydrogen and oxygen production.

Official Gazette of the U S Patent Office



N79-11471* National Aeronautics and Space Administration
Pasadena Office Calif

NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM Patent

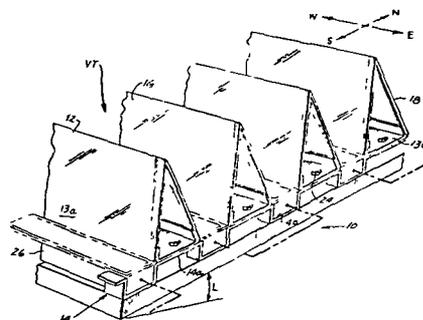
M Kudret Selcuk inventor to NASA (JPL) Issued 31 Oct 1978 8 p Filed 27 May 1977 Supersedes N77-28583 (15 - 19 p 2550) Continuation-in part of US Patent Appl SN-765129 filed 3 Feb 1977 US Patent 4 091 798 Sponsored by NASA

(NASA-Case-NPO-13817-1 US-Patent-4 122 833
US-Patent-Appl-SN-801452 US-Patent-Class-126-271
US-Patent-Class-29-270 US-Patent-Class-350 288

US-Patent-Class-350-299 US-Patent-4 091 798 US-Patent-Appl-SN-765139) Avail US Patent Office CSCL 10A

A solar energy collector system is described characterized by an improved concentrator for directing incident rays of solar energy on parallel strip-like segments of a flatplate receiver. Individually mounted reflector modules of a common asymmetrical triangular cross-sectional configuration supported for independent orientation are asymmetric included with vee-trough concentrators for deflecting incident solar energy toward the receiver.

Official Gazette of the U S Patent Office



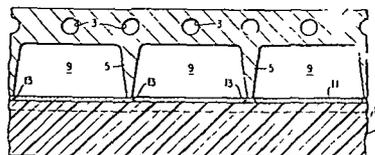
N79-11472* National Aeronautics and Space Administration
Lewis Research Center Cleveland Ohio

SOLAR CELL COLLECTOR AND METHOD FOR PRODUCING SAME Patent

John C Evans Jr inventor (to NASA) Issued 24 Oct 1978 5 p Filed 21 Oct 1977 Division of US Patent Appl SN-770869 Filed 22 Feb 1977 US Patent-4 082 569
(NASA-Case-LEW-12552-2 US-Patent-4 122 214
US-Patent-Appl-SN-844346 US-Patent-Class-427-75
US-Patent-Class-427-84 US-Patent-Class-427-123
US-Patent-Class-427-126 US-Patent-Class-427-261
US-Patent-Class-427-343 US-Patent-Class-427-398A
US-Patent-Class-427-399 US-Patent-Class-29-572
US-Patent-4 082 569 US-Patent-Appl-SN-770869) Avail US Patent Office CSCL 10A

A transparent conductive collector layer containing conductive metal channels is formed as a layer on a photovoltaic substrate by coating a photovoltaic substrate with a conductive mixed metal layer. A heat sink having portions protruding from one of its surfaces is attached. These protruding portions define a continuous pattern in combination with recessed regions among them such that they are in contact with the conductive layer of the photovoltaic substrate. Heating the substrate while simultaneously oxidizing the portions of the conductive layer exposed to a gaseous oxidizing substance forced into the recessed regions of the heat sink creates a transparent metal oxide layer on the substrate. A continuous pattern of highly conductive metal channels is contained in the metal oxide layer.

Official Gazette of the U S Patent Office



44 ENERGY PRODUCTION AND CONVERSION

N79-12541* National Aeronautics and Space Administration
Pasadena Office Calif

METHOD AND APPARATUS FOR MEASURING MINORITY CARRIER LIFETIMES AND BULK DIFFUSION LENGTH IN P-N JUNCTION SOLAR CELLS Patent

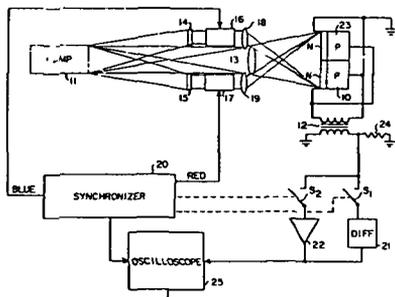
Oldwig vonRoos H inventor (to NASA) (JPL) Issued 24 Oct 1978 8 p Filed 16 Dec 1977 Supersedes N78-19608 (16 - 10 p 1324) Sponsored by NASA

(NASA-Case-NPO-14100-1 US-Patent-4 122 383

US-Patent-Appl-SN-861391 US-Patent-Class-324-20R

US-Patent-Class-324-22) Avail US Patent and Trademark Office CSCL 10A

Carrier lifetimes and bulk diffusion length are qualitatively measured as a means for qualification of a P-N junction photovoltaic solar cell. High frequency (blue) monochromatic light pulses and low-frequency (red) monochromatic light pulses were alternately applied to the cell while it was irradiated by light from a solar simulator and synchronously displaying the derivative of the output voltage of the cell on an oscilloscope. The output voltage is a measure of the lifetimes of the minority carriers (holes) in the diffused N layer and majority carriers (electrons) in the bulk P material and of the diffusion length of the bulk silicon. By connecting a reference cell in this manner with a test cell to be tested in reverse parallel the display of a test cell that matches the reference cell will be a substantially zero output. Official Gazette of the U S Patent and Trademark Office



N79-14526* National Aeronautics and Space Administration
Pasadena Office Calif

SUN TRACKING SOLAR ENERGY COLLECTOR Patent

Gerald S Perkins, inventor (to NASA) (JPL) Issued 5 Sep 1978 6 p Filed 6 Apr 1977 Supersedes N77-24590 (15 - 15 p 2010) Sponsored by NASA

(NASA-Case-NPO-13921-1 US-Patent-4,111,184.

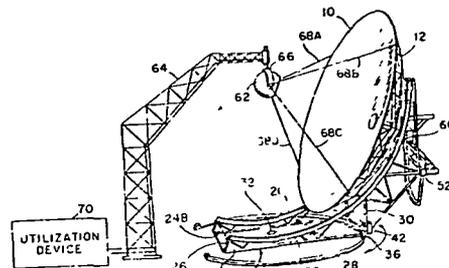
US-Patent-Appl-SN-785257, US-Patent-Class-126-270.

US-Patent-Class-126-271) Avail US Patent and Trademark Office CSCL 10A

A parabolic reflector is supported so that it can track the sun. The support for this reflector comprises an azimuth frame supported on two wheels and a central pivotal point which are positioned in a substantially triangular configuration. On top of the azimuth frame, there is provided an elevation frame. The reflector rides on wheels captured within curved rails. The wheels of the azimuth frame are driven by an azimuth actuator. The reflector structure is counterbalanced about its elevation axis by a pendulum cable system which is driven by a motor. At the focal point of the parabolic reflector a heat engine or receiver is mounted independently on the reflector. Suitable means are

provided for moving the reflector about its two axes

Official Gazette of the U S Patent and Trademark Office



N79-14527* National Aeronautics and Space Administration
Washington D C

SAFETY FLYWHEEL Patent

Richard T Schneider inventor (to NASA) (Univ of Florida, Gainesville) Issued 2 Jan 1979 4 p Filed 17 Jan 1977 Supersedes N77-22484 (15 - 13, p 1729) Sponsored by NASA

(NASA-Case-HQN-10888-1 US-Patent-4 132 130

US-Patent-Appl-SN-760057 US-Patent-Class-74-572

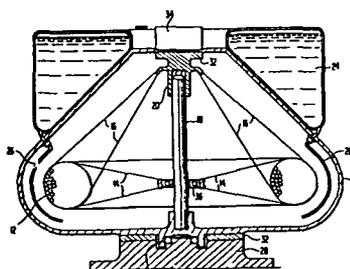
US-Patent-Class-415-9, US-Patent-Class-416-2

US-Patent-Class-303-92 US-Patent-Class-188-151A

US-Patent-Class-188-269) Avail US Patent and Trademark Office CSCL 10A

An inertial energy storage device is disclosed which uses flywheel made of flexible material such as a twisted rope ring. A small number of the strands of the rope ring have a tensile strength that is lower than that of most of the other strands so that should any of these strands fail, they will begin to whiplash allowing such a failure to be detected and braked before a catastrophic failure occurs. This is accomplished by the inclusion of glass tubes located around the periphery of the flywheel. The tubes are in communication with a braking fluid reservoir. The flywheel and glass tubes are enclosed within a vacuum-tight housing. The whiplashing of a broken strand breaks one or more glass tubes. This causes the housing to be flooded with the braking fluid thereby braking the rotation of the flywheel.

Official Gazette of the U S Patent and Trademark Office



N79-14528* National Aeronautics and Space Administration
Lewis Research Center, Cleveland Ohio

BACK WALL SOLAR CELL Patent

Henry W Brandhorst, Jr inventor (to NASA) Issued 26 Dec 1978 5 p Filed 24 Apr 1978 Supersedes N78-25556 (16 - 16, p 2137) Continuation-in-part of abandoned US Patent Appl SN-760771, filed 19 Jan 1977

(NASA-Case-LEW-12236-2, US-Patent-4 131 486

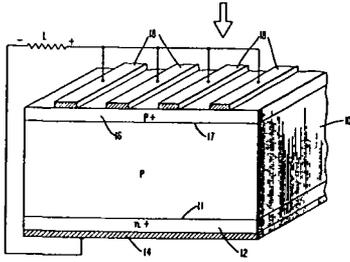
US-Patent-Appl-SN-899123, US-Patent-Class-136-89SJ,

US-Patent-Class-357-30 US-Patent-Appl-SN-760771) Avail

US Patent and Trademark Office CSCL 10A

44 ENERGY PRODUCTION AND CONVERSION

A solar cell is disclosed which comprises a first semiconductor material of one conductivity type with one face having the same conductivity type but more heavily doped to form a field region arranged to receive the radiant energy to be converted to electrical energy, and a layer of a second semiconductor material preferably highly doped of opposite conductivity type on the first semiconductor material adjacent the first semiconductor material at an interface remote from the heavily doped field region. Instead of the opposite conductivity layer, a metallic Schottky diode layer may be used in which case no additional back contact is needed. A contact such as a gridded contact previous to the radiant energy may be applied to the heavily doped field region of the more heavily doped, same conductivity material for its contact. Official Gazette of the U S Patent and Trademark Office



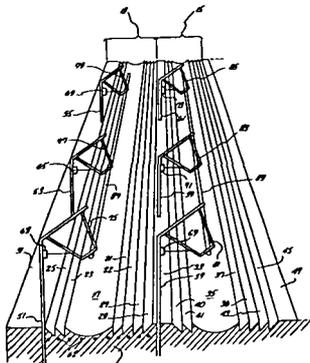
N79-14529* National Aeronautics and Space Administration Pasadena Office, Calif

PRIMARY REFLECTOR FOR SOLAR ENERGY COLLECTION SYSTEMS Patent

Charles G Miller inventors (to NASA) (JPL) and James B Stephens (JPL) Issued 26 Dec 1978 9 p Filed 15 May 1978 Supersedes N78-25559 (16 - 16, p2138) Division of US Patent Appl SN-762363, filed 25 Jan 1977 which is a division of US Patent Appl SN-598969, filed 24 Jul 1975 US Patent-4 065 053 Sponsored by NASA (NASA-Case-NPO-13579-4, US-Patent-4,131,336 US-Patent-Appl-SN-906297, US-Patent-Class-350-292 US-Patent-Class-126-271, US-Patent-Class-350-293 US-Patent-Class-350-320 US-Patent-4 065,053 US-Patent-Appl-SN-762363 US-Patent-Appl-SN-598969) Avail US Patent and Trademark Office CSCL 10A

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

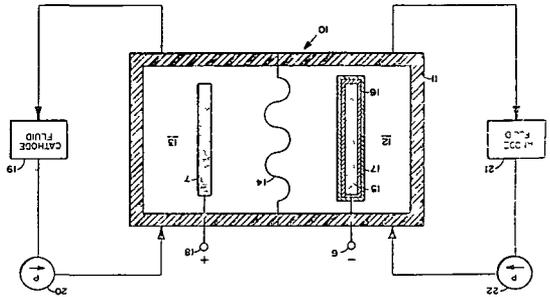
Official Gazette of the U S Patent and Trademark Office



N79-14538*# National Aeronautics and Space Administration Lewis Research Center Cleveland, Ohio
CATALYST SURFACES FOR THE CHROMOUS/CHROMIC REDOX COUPLE Patent Application

Jose D Giner (Giner, Inc., Waltham, Mass) and Kathleen J Cahill inventors (to NASA) (Giner, Inc., Waltham, Mass) Filed 29 Nov 1978 13 p Sponsored by NASA (NASA-Case-LEW-13148-1 US-Patent-Appl-SN-964754) Avail NTIS HC A02/MF A01 CSCL 10A

An electricity-producing cell of the reduction-oxidation (REDOX) type is presented. The cell comprises a container divided into anode and cathode compartments by an ion permeable membrane. The novelty of the invention appears to lie in the provision of selected catalytic coatings with lead on the anode electrode of a REDOX cell to greatly increase current density. NASA



N79-17313* National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

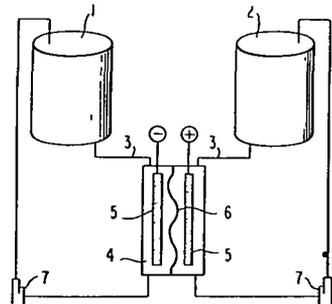
FORMULATED PLASTIC SEPARATORS FOR SOLUBLE ELECTRODE CELLS Patent

Dean W Sheibley inventor (to NASA) Issued 9 Jan 1979 8 p Filed 10 Mar 1977 Supersedes N77-18560 (15 - 09 p 1194)

(NASA-Case-LEW-12358-1 US-Patent-4 133 941 US-Patent-Appl-SN-776146 US-Patent-Class-429-33, US-Patent-Class-429-101) Avail US Patent and Trademark Office CSCL 10A

The fabrication and milling of membranes comprising a hydrochloric acid-insoluble sheet of a mixture of a rubber and a powdered ion transport material are described. The sheet can be present as a coating upon a flexible and porous substrate. These membranes can be used in oxidation-reduction electrical accumulator cells wherein the reduction of one member of a couple is accompanied by the oxidation of the other member of the couple on the other side of the cell and this must be accompanied by a change in chloride ion concentration in both sides.

Official Gazette of the U S Patent and Trademark Office



44 ENERGY PRODUCTION AND CONVERSION

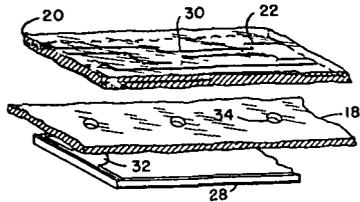
N79-17314* National Aeronautics and Space Administration
Pasadena Office Calif
SOLAR ARRAY STRIP AND A METHOD FOR FORMING THE SAME Patent

Robert L Mueller (JPL) and Robert K Yasui inventors (to NASA)
(JPL) Issued 9 Jan 1979 7 p Filed 24 Jun 1977 Sponsored by NASA

(NASA-Case-NPO-13652-1. US-Patent-4 133 697
US-Patent-Appl-SN-809890 US-Patent-Class-136-89P
US-Patent-Class-136-89CC, US-Patent-Class-29-572) Avail US Patent and Trademark Office CSCL 10A

A flexible solar array strip is formed by providing printed circuitry between flexible layers of a nonconductive material depositing solder pads on the printed circuitry and storing the resulting substrate on a drum from which it is then withdrawn and advanced along a linear path. Solderless solar cells are serially transported into engagement with the pads and are infrared radiation to melt the solder and attach the cells to the circuitry. Excess flux is cleaned from the solar cells which are then encapsulated in a protective coating. The resulting array is then wound on a drum.

Official Gazette of the U S Patent and Trademark Office



N79-17315*# National Aeronautics and Space Administration
Pasadena Office Calif

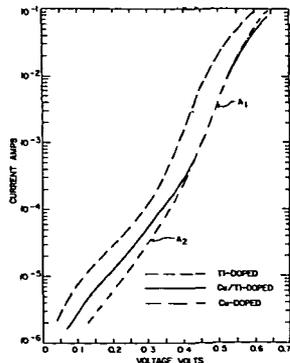
METHOD OF MITIGATING TITANIUM IMPURITIES EFFECTS IN P-TYPE SILICON MATERIAL FOR SOLAR CELLS Patent Application

Amal M Salama, inventor (to NASA) (JPL) Filed 31 Jan 1979 17 p

(Contract NAS7-100)
(NASA-Case-NPO-14635-1 US-Patent-Appl-SN-008212) Avail NTIS HC A02/MF A01 CSCL 10A

A technique is presented for reducing the deleterious effect of titanium impurities (commonly found in metallurgical grade silicon) on silicon solar cells. The novelty of the invention resides in the technique of adding copper to silicon melt for the Czochralski crystal growth process when titanium impurities are present. The copper added is of at least the same concentration as titanium impurities present, but not greater than 10 to the 16th power atoms/cu cm. This mitigates the deleterious effects of the titanium impurities when the silicon crystal growth is used for solar cells.

NASA



N79-18443* National Aeronautics and Space Administration
Pasadena Office Calif

THERMAL ENERGY TRANSFORMER Patent

C Martin Berdahl (JPL) and Carl L Thiele inventors (to NASA)
(JPL) Issued 23 Jan 1979 5 p Filed 12 Aug 1977 Supersedes N77-30616 (15 - 21 p 2824) Sponsored by NASA

(NASA-Case-NPO-14058-1 US-Patent-4 135 367

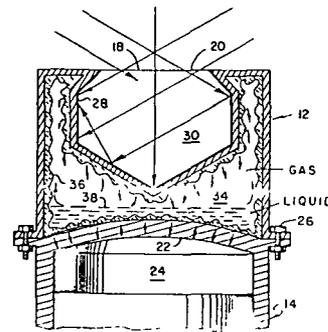
US-Patent-Appl-SN-824024 US-Patent-Class-60-641

US-Patent-Class-60-508 US-Patent-Class-60-572

US-Patent-Class-126-271 US-Patent-Class-165-105) Avail US Patent and Trademark Office CSCL 10A

For use in combination with a heat engine a thermal energy transformer is presented. It is comprised of a flux receiver having a first wall defining therein a radiation absorption cavity for converting solar flux to thermal energy and a second wall defining an energy transfer wall for the heat engine. There is a heat pipe chamber interposed between the first and second walls having a working fluid disposed within the chamber and a wick lining the chamber for conducting the working fluid from the second wall to the first wall. Thermal energy is transferred from the radiation absorption cavity to the heat engine.

Official Gazette of the U S Patent and Trademark Office



N79-18444* National Aeronautics and Space Administration
Lewis Research Center Cleveland Ohio

METHOD FOR FABRICATING SOLAR CELLS HAVING INTEGRATED COLLECTOR GRITS Patent

John C Evans Jr inventor (to NASA) Issued 23 Jan 1979 6 p Filed 23 Dec 1977 Supersedes N78-25558 (16 - 16 p 2138) Division of US Patent Appl SN-803823 filed 6 Jun 1977 US-Patent-4 104 084

(NASA-Case-LEW-12819-2 US-Patent-4 135 290

US-Patent-Appl-SN-863770 US-Patent Class-29-572

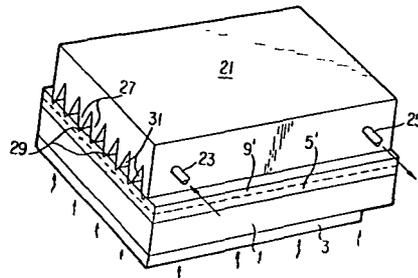
US-Patent-Class-29-578 US-Patent-Class-29-591

US-Patent-Class-148-6 3 US-Patent-4 104 084

US-Patent-Appl-SN-803823) Avail US Patent and Trademark Office CSCL 10A

The photovoltaic devices of the invention are heterojunction or Schottky barrier devices which possess an integral mixed metal oxide coating in which is embedded a metallic network which functions as an efficient collector of electrons set in motion by the photovoltaic process. The metal grid system is formed from the metal elements of the transparent conductive mixed metal oxide coating which is in contact with the oxide coating which constitutes the barrier of the devices with the semiconductor substrate.

Official Gazette of the U S Patent and Trademark Office



44 ENERGY PRODUCTION AND CONVERSION

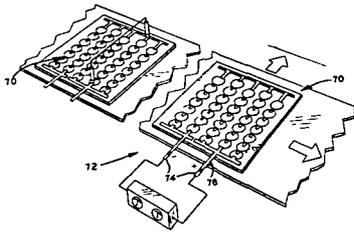
N79-18445*# National Aeronautics and Space Administration Pasadena Office Calif

AN IMPROVED SOLAR PANEL AND METHOD FOR FABRICATING THE SAME Patent Application

Joseph Bonacquisti (RCA Corp Princeton New Jersey) and Marvin S Crouthanel inventors (to NASA) (RCA Corp Princeton New Jersey) Filed 6 Mar 1979 19 p Sponsored by NASA (Contract JPL-954352)

(NASA-Case-NPO-14490-1 US-Patent-Appl-SN-017884) Avail NTIS HC A02/MF A01 CSCL 10A

A method for the fabrication of solar panels and in particular laminated solar panels is presented. The method has steps which are particularly adaptable for automation. The solar panel is fabricated by electrically interconnecting a plurality of individual solar cells into a plurality of strings and connecting the plurality of strings into an array. The array is laminated between a pair of transparent plates. NASA



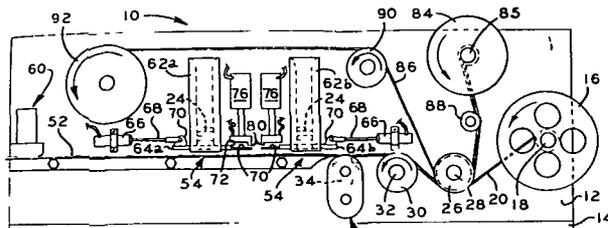
N79-18446*# National Aeronautics and Space Administration Pasadena Office Calif

METHOD AND APPARATUS FOR FABRICATING IMPROVED SOLAR CELL MODULES Patent Application

Joseph T Bloch (Boeing Aerospace Seattle Wash) Randolph T Hanger (Boeing Aerospace Seattle Wash) and Frank W Nichols inventors (to NASA) (Boeing Aerospace Seattle) Filed 23 Feb 1979 16 p (Contract JPL-953984)

(NASA-Case-NPO-14416-1 US-Patent-Appl-SN-014664) Avail NTIS HC A02/MF A01 CSCL 10A

The apparatus includes a supply drum for feeding a flexible strip having deposited thereon etched electrical circuitry. NASA



N79-18455*# National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

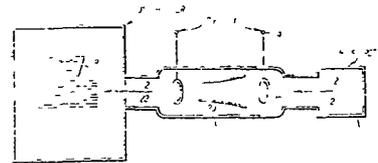
ATOMIC HYDROGEN STORAGE METHOD AND APPARATUS Patent Application

John A Woolam inventor (to NASA) Filed 6 Feb 1979 10 p

(NASA-Case-LEW-12081-3 US-Patent-Appl-SN-009887) Avail NTIS HC A02/MF A01 CSCL 10B

Atomic hydrogen for use as a fuel or an explosive is stored in the presence of a strong magnetic field in exfoliated layered compounds such as molybdenum disulfide or an elemental layer material such as graphite. The compound is maintained at liquid helium temperatures and the atomic hydrogen is collected on

the surfaces of the layered compound which are exposed during delamination (exfoliation). The strong magnetic field and the low temperature combine to prevent the atoms of hydrogen from combining to form molecules. NASA



N79-19447* National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt Md

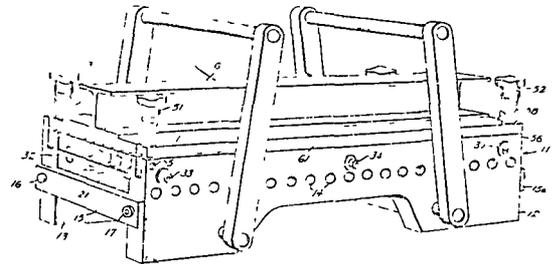
SOLAR CELL MODULE ASSEMBLY JIG Patent

Herbert W OFarrell inventor (to NASA) (TRW Inc., Redondo Beach, Calif) Issued 26 Jul 1966 8 p Filed 10 Jun 1963 (NASA-Case-XGS-00829-1, US-Patent-3 262,694)

US-Patent-Appl-SN-286824 US-Patent-Class-269-153) Avail US Patent and Trademark Office CSCL 10A

The invention relates to the manufacture of solar cell modules and more particularly to a jig for assembling positioning and maintaining the components under resilient pressure while the entire assembly and the jig is subjected to heat for simultaneously soldering all of the various circuit connections, as well as structurally bonding the layers into a strong light weight structure which minimizes the tendency of the solar cells to crack and the other components and electrical connections to fracture.

Official Gazette of the U S Patent and Trademark Office



N79-20496*# National Aeronautics and Space Administration Pasadena Office, Calif

MULTI-CHANNEL ROTATING OPTICAL INTERFACE FOR DATA TRANSMISSION Patent Application

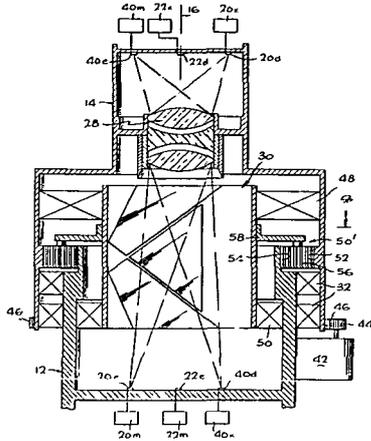
Charles V Olivie inventor (to NASA) (JPL) Filed 25 Aug 1977 12 p Sponsored by NASA

(NASA-Case-NPO-14066-1 US-Patent-Appl-SN-827464) Avail NTIS HC A02/MF A01 CSCL 10C

An apparatus is presented for transmitting multiple channels of data across a rotating interface such as between an antenna that rotates with respect to a platform. It includes a plurality of light-emitter elements and light detector elements located on the two bodies that rotate relative to each other. A lens for focusing light from each emitter element onto a corresponding

45 ENVIRONMENT POLLUTION

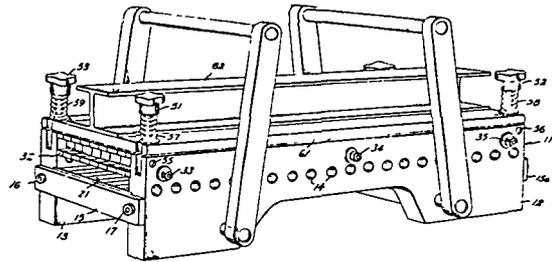
detector element, and an image rotating means which is turned as one of the objects rotates is also included to derotate the images of the emitter elements that are to be focused on the detector elements
NASA



N79-21639* National Aeronautics and Space Administration
Goddard Space Flight Center, Greenbelt Md
SOLAR CELL MODULE ASSEMBLY JIG Patent
Herbert W Farrell inventor (to NASA) (TRW, Inc Redondo Beach, Calif.) Issued 26 Jul 1966 7 p Filed 10 Jun 1963 Sponsored by NASA
(NASA-Case-XGS-00829-1 US-Patent-3 262,694, US-Patent-Appl-SN-286824, US-Patent-Class-269-153) Avail US Patent and Trademark Office CSCL 10A

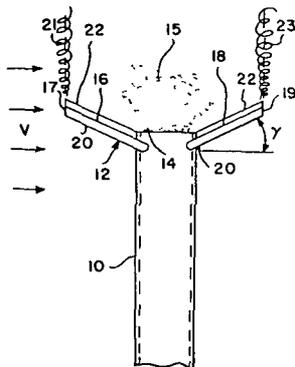
The invention relates to the manufacture of solar cell modules and more particularly to a jig for assembling positioning and maintaining the components under resilient pressure, while the entire assembly and the jig is subjected to heat for simultaneously soldering all of the various circuit connections, as well as structurally bonding the layers into a strong light weight structure which minimizes the tendency of the solar cells to crack and the other components and electrical connections to fracture

Official Gazette of the U S Patent and Trademark Office



45 ENVIRONMENT POLLUTION

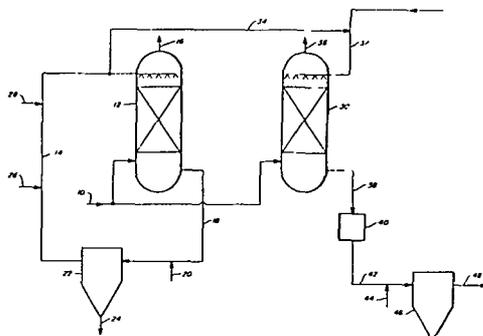
and angle of ascension is controlled in order to achieve optimum effluent dispersal by varying the airfoil angle of attack
 Official Gazette of the U S Patent Office



N79-12584* National Aeronautics and Space Administration
 Lyndon B Johnson Space Center Houston Tex
SIMULTANEOUS TREATMENT OF SO2 CONTAINING STACK GASES AND WASTE WATER Patent
 Jerry C Poradek and Dwight D Collins inventors (to NASA)
 (Chemsoil Corp Bakersfield Calif) Issued 31 Oct 1978 6 p
 Filed 21 Nov 1977 Supersedes N78-15954 (16 - 06 p 0829)
 (NASA-Case-MS-C-16258-1 US-Patent-4 123 355
 US-Patent-Appl-SN-853705 US-Patent-Class-210-50
 US-Patent-Class-55-73 US-Patent-Class-210-60
 US-Patent-Class-210-63R US-Patent-Class-423-242) Avail US
 Patent and Trademark Office CSCL 13B

A process for simultaneously removing sulfur dioxide from stack gases and the like and purifying waste water such as derived from domestic sewage is described. A portion of the gas stream and a portion of the waste water the latter containing dissolved iron and having an acidic pH are contacted in a closed loop gas-liquid scrubbing zone to effect absorption of the sulfur dioxide into the waste water. A second portion of the gas stream and a second portion of the waste water are controlled in an open loop gas-liquid scrubbing zone. The second portion of the waste water contains a lesser amount of iron than the first portion of the waste water. Contacting in the open loop scrubbing zone is sufficient to acidify the waste water which is then treated to remove solids originally present

Official Gazette of the U S Patent and Trademark Office



46 GEOPHYSICS

Includes aeronomy upper and lower atmosphere studies, ionospheric and magnetospheric physics, and geomagnetism

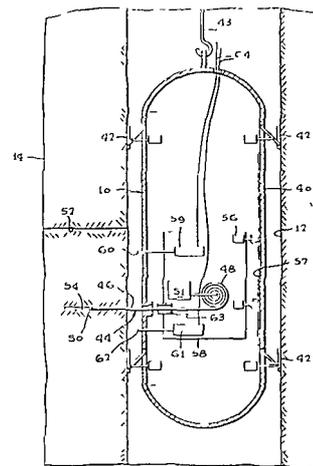
For space radiation see 93 Space Radiation

N79-19521*# National Aeronautics and Space Administration
 Pasadena Office, Calif

BOREHOLE GEOLOGICAL ASSESSMENT Patent Application

William Spuck III inventor (to NASA) (JPL) Filed 4 May 1978
 19 p Sponsored by NASA
 (NASA-Case-NPO-14231-1, US-Patent-Appl-SN-903019) Avail
 NTIS HC A02/MF A01 CSCL 08G

A method and apparatus are provided for performing geological assessments of a formation located along a borehole which includes a boring tool that bores a pair of holes into the walls of the borehole and into the surrounding strata, and a pair of probes installed in the holes. One of the probes applies an input such as a current or pressured fluid and the other probe senses a corresponding input which it receives from the strata. The boring tool can include a series of rigid bore segments that can be easily installed in a housing that lies in the borehole and apparatus for connecting the bore segments in series while also advancing them into the strata surrounding the borehole, so that a straight hole can be bored in the strata. NASA



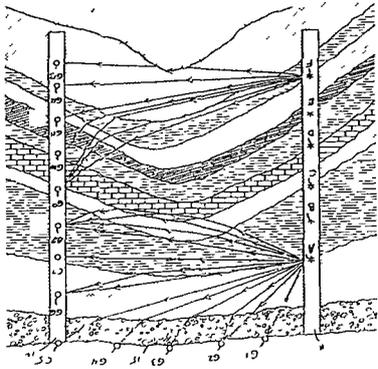
N79-20555*# National Aeronautics and Space Administration
 Pasadena Office, Calif

A SYSTEM FOR PLOTTING SUBSOIL STRUCTURE AND METHOD THEREFOR Patent Application

Keshavayengar Y Narashimhan (JPL), Shakkottai P Parthasarathy (JPL), and Robert Nathan, inventors (to NASA) (JPL) Filed 6 Sep 1977 19 p Sponsored by NASA
 (NASA-Case-NPO-14191-1, US-Patent-Appl-SN-830846) Avail
 NTIS HC A02/MF A01 CSCL 08G

Data for use in producing a tomograph of subsol structure between boreholes is derived by placing spaced geophones in one borehole, and if desired also on the earth surface 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

(pixels) between the boreholes Such information is useable to produce a tomograph of the subsoil structure between the boreholes
NASA



48 OCEANOGRAPHY

Includes biological dynamic and physical oceanography and marine resources

N79-10689*# National Aeronautics and Space Administration Marshall Space Flight Center Huntsville Ala
OCEANIC WAVE MEASUREMENT SYSTEM Patent Application

John F Holmes (Computer Sciences Corp Bay St Louis Miss) and Ronald T Miles, inventors (to NASA) (Computer Sciences Corp Bay St Louis Miss) Filed 16 Oct 1978 13 p Sponsored by NASA

(NASA-Case-MFS-23862-1 US-Patent-Appl-SN-951423) Avail NTIS HC A02/MF A01 CSCL 08C

A system which utilizes a barometer to measure oceanic waves is presented The basic novelty of the invention lies in combining the technique of obtaining a height signal by barometric measurement and effecting crest-to-trough measurements each half cycle of wave motion whereby a complete history of crest-to-trough and trough-to-crest measurements is recorded The invention conveniently provides for the additional measurements of average wave frequency and significant wave height
NASA

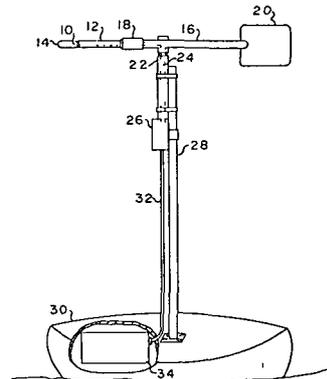
N79-20556*# National Aeronautics and Space Administration Pasadena Office Calif

A SYSTEM FOR DETECTING SUBSTRUCTURE MICRO-FRACTURES AND METHOD THEREFOR Patent Application

Shakkottai P Parthasarathy (JPL) and Keschavaiyengar Y Narashimhan, inventors (to NASA) (JPL) Filed 6 Sep 1977 13 p Sponsored by NASA

(NASA-Case-NPO-14192-1 US-Patent-Appl-SN-830562) Avail NTIS HC A02/MF A01 CSCL 08G

A system to determine substructure permeability is described Bursts of signals at different frequencies are induced into substructure, adjacent a borehole The return signals from each burst of signals are normalized to compensate for the attenuation, experienced by more distant return signals The peak amplitudes of return signals above a selected level, are cut off, and an average signal is produced from the normalized amplitude-limited return signals of each burst The averaged signals of the return signals of all the signal bursts at the different frequencies are processed, to provide a combined signal whose amplitude is related to the microfracture density of the substructure adjacent to the borehole
Author



51 LIFE SCIENCES (GENERAL)

Includes genetics

N79-10693* National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville Ala

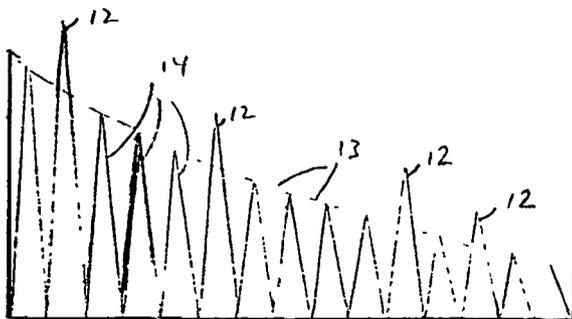
WATER SYSTEM VIRUS DETECTION Patent

Alan S Fraser (Organon Diagnostics El Monte Calif) Arthur F Wells (Organon Diagnostics El Monte, Calif) and Harold J Tenoso inventors (to NASA) (Organon Diagnostics El Monte Calif) Issued 3 Oct 1978 7 p Filed 28 Apr 1977 Sponsored by NASA

(NASA-Case-MS-C-16098-1 US-Patent-4 118 315

US-Patent-Class-210-96M US-Patent-Class-210-433M) Avail US Patent Office CSCL 06M

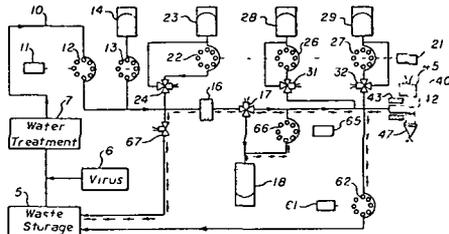
The performance of a waste water reclamation system is monitored by introducing a non-pathogenic marker virus bacteriophage F2 into the waste-water prior to treatment and thereafter testing the reclaimed water for the presence of the marker virus A test sample is first concentrated by absorbing any marker virus onto a cellulose acetate filter in the presence of a trivalent cation at low pH and then flushing the filter with a limited quantity of a glycine buffer solution to desorb any



51 LIFE SCIENCES (GENERAL)

needed at any time during the freezing process. The temperature of the bag and hence of the tissue is compared with a time programmed desired value for the tissue temperature to derive an error indication. The heater is activated in response to the error indication so that the temperature of the tissue follows the desired value for the time programmed tissue temperature. The tissue is heated to compensate for excessive cooling of the tissue as a result of the cooling by the refrigerating gas. In response to the error signal the heater is deactivated while the latent heat of fusion is being removed from the tissue while the tissue is changing phase from liquid to solid.

Official Gazette of the U S Patent Office

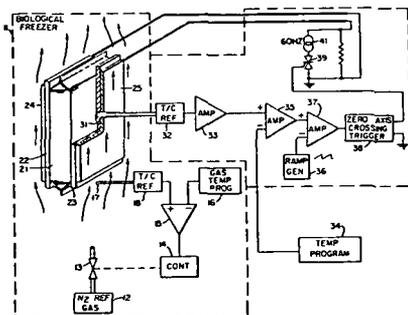


N79-10694* National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt Md **SYSTEM FOR AND METHOD OF FREEZING BIOLOGICAL TISSUE Patent**

Thomas E Williams and Thomas A Cygnarowicz inventors (to NASA) issued 3 Oct 1978 7 p Filed 14 Jun 1977 Supersedes N77-27693 (15 - 18 p 0789)
(NASA-Case-GSC-12173-1 US-Patent-4 117 881
US-Patent-Appl-SN-806440 US-Patent-Class-165-2
US-Patent-Class-165-30 US-Patent-Class-62-78
US-Patent-Class-62-514R US-Patent-Class-195-1 8,
US-Patent-Class-219-299 US-Patent-Class-219-302) Avail US Patent Office CSCL 06B

Biological tissue is frozen while a polyethylene bag placed in abutting relationship against opposed walls of a pair of heaters. The bag and tissue are cooled with refrigerating gas at a time programmed rate at least equal to the maximum cooling rate marker virus present on the filter. Photo-optical detection of indirect passive immune agglutination by polystyrene beads indicates the performance of the water reclamation system in removing the marker virus. A closed system provides for concentrating any marker virus initiating and monitoring the passive immune agglutination reaction and then flushing the system to prepare for another sample.

Official Gazette of the U S Patent Office



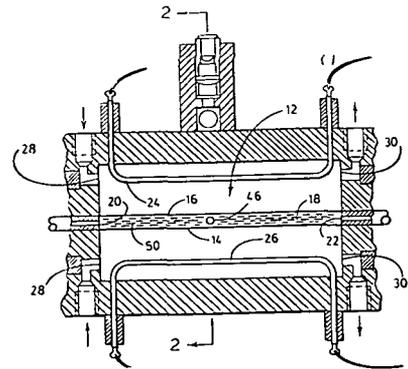
N79-21743*# National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala

A METHOD FOR SEPARATING BIOLOGICAL CELLS Patent Application

D E Brooks, inventor (to NASA) 6 Mar 1979 11 p
(NASA-Case-MFS-23883-1, US-Patent-Appl-SN-017888) Avail NTIS HC A02/MF A01 CSCL 06C

A method for separating biological cells by suspending a mixed cell population in a body of aqueous polymer is described. The system consists of phases for which these cells exhibit an affinity including at least one droplet phase with a surface potential and one droplet phase characterized by another surface potential. The system is subjected to an electrostatic field established between a pair of electrodes with the field being of sufficient intensity for causing some of the droplets to migrate toward one of the electrodes with an attendant separation of the cells.

NASA



52 AEROSPACE MEDICINE

Includes physiological factors biological effects of radiation, and weightlessness

N79-10724* National Aeronautics and Space Administration Ames Research Center Moffett Field Calif

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

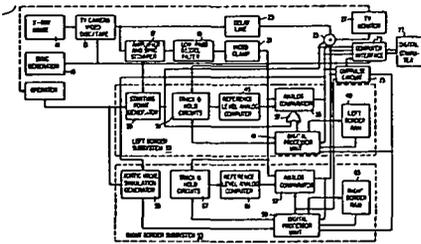
Johan H C Reiber inventor (to NASA) Issued 18 Jul 1978 19 p Filed 16 Feb 1977 Supersedes N77-17701 (15 - 08 p 1069)

(NASA-Case-ARC-10985-1, US-Patent-4 101 961
US-Patent-Appl-SN-769148 US-Patent-Class-364-417,
US-Patent-Class-358-96 US-Patent-Class-358-111
US-Patent-Class-128-2 05R) Avail US Patent Office CSCL 06B

A real-time contour detector and data acquisition system is described for an angiographic apparatus having a video scanner for converting an X-ray image of a structure characterized by a change in brightness level compared with its surrounding into video format and displaying the X-ray image in recurring video fields. The real-time contour detector and data acquisition system includes track and hold circuits, a reference level analog computer,

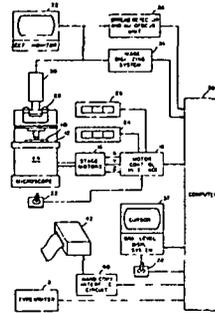
circuit, an analog comparator, a digital processor, a field memory, and a computer interface.

Official Gazette of the U S Patent Office



An automatic chromosome analysis system is provided wherein a suitably prepared slide with chromosome spreads thereon is placed on the stage of an automated microscope. The automated microscope stage is computer operated to move the slide to enable detection of chromosome spreads on the slide. The X and Y location of each chromosome spread that is detected is stored. The computer measures the chromosomes in a spread, classifies them by group or by type, and also prepares a digital karyotype image. The computer system can also prepare a patient report summarizing the result of the analysis and listing suspected abnormalities.

Official Gazette of the U S Patent and Trademark Office

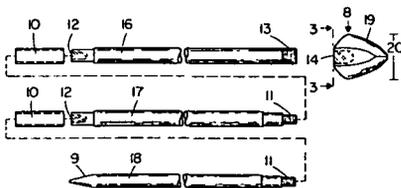


N79-11684* National Aeronautics and Space Administration
Ames Research Center Moffett Field Calif
SUBCUTANEOUS CHANNELING PROBE Patent Application

Gordon F Lund (NAC-NRC) Richard C Simmonds and Bill A Williams inventors (to NASA) Filed 31 Oct 1978 12 p (NASA-Case-ARC-11091-1 US-Patent-Appl-SN-956162) Avail NTIS HC A02/MF A01 CSCL 06B

The subcutaneous channeling probe 15 provided an instrument for use in the placement of biosensors with long leads in animals. The probe channeled subcutaneously through connective tissue from the site of lead entry 4 to the site of biosensor placement. After securing a sensor to the end of the probe, the probe was pulled out of an exit incision 5, guiding the biosensor and lead into place. The probe was constructed of flexible rod material such as standard 9.5 mm (3/8 inch) nylon rod and was provided with blunted pointed tips: spearhead tip 8 and tapered end tip 9. This design permitted the efficient channeling of the instrument through connective tissue when force was exerted through the rod. However, because of the blunted edges 19 and tips, the actual cutting of the connective tissue was kept to a minimum. Further, the probe was constructed in sections 16, 17, and 18.

NASA



N79-14749* National Aeronautics and Space Administration
Pasadena Office, Calif
GAS DIFFUSION LIQUID STORAGE BAG AND METHOD OF USE FOR STORING BLOOD Patent

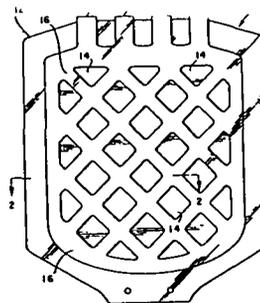
Herman Bank (JPL) and Edward L Cleland inventors (to NASA) (JPL) Issued 2 Jan 1979 5 p Filed 28 Jun 1976 Supersedes N78-25760 (16 - 16, p 2164) Sponsored by NASA (NASA-Case-NPO-13930-1, US-Patent-4 132 594, US-Patent-Appl-SN-700467, US-Patent-Class-195-1 8, US-Patent-Class-422-41, US-Patent-Class-422-48, US-Patent-Class-55-15-8, US-Patent-Class-128-214D, US-Patent-Class-128-272, US-Patent-Class-150-1, US-Patent-Class-206-439, US-Patent-Class-210-DIG 23) Avail US Patent and Trademark Office CSCL 06B

The shelf life of stored whole blood may be doubled by adding a buffer which maintains a desired pH level. However, this buffer causes the generation of CO₂ which, if not removed at a controlled rate, causes the pH value of the blood to decrease, which shortens the useful life of the blood. A blood storage bag is described which permits the CO₂ to be diffused out at a controlled rate into the atmosphere, thereby maintaining the desired pH value and providing a bag strong enough to permit handling. Official Gazette of the U S Patent and Trademark Office

N79-12694* National Aeronautics and Space Administration
Pasadena Office Calif
AUTOMATED CLINICAL SYSTEM FOR CHROMOSOME ANALYSIS Patent

Kenneth R Castleman (JPL), Howard J Friedan (JPL), Elbert T Johnson (JPL), Paul A Rennie (JPL) and Raymond J Wall, inventors (to NASA) (JPL) Issued 24 Oct 1978 141 p Filed 17 May 1976 Supersedes N77-19750 (15 - 10, p 1357) Sponsored by NASA

(NASA-Case-NPO-13913-1 US-Patent-4,122,518, US-Patent-Appl-SN-687251, US-Patent-Class-364-300, US-Patent-Class-128-2R, US-Patent-Class-364-120, US-Patent-Class-364-415, US-Patent-Class-364-900) Avail US Patent and Trademark Office CSCL 06B



N79-14750* National Aeronautics and Space Administration
Goddard Space Flight Center, Greenbelt Md

DETERMINATION OF ANTIMICROBIAL SUSCEPTIBILITIES ON INFECTED URINES WITHOUT ISOLATION Patent

Grace L. Picciolo, Emmett W. Chappelle, Jody W. Deming (New England Medical Ctr., Boston, Mass.), Christian G. Shrock (New England Med Ctr. Boston Mass), Hillar Vellend (New England Med Ctr., Boston, Mass), Michael J. Barza (New England Med Ctr., Boston Mass) and Louis Weinstein, inventors (to NASA) (New England Med Ctr. Boston, Mass) Issued 2 Jan 1979 7 p Filed 23 Apr 1976 Supersedes N77-26797 (15 - 17, p 2306) Sponsored by NASA

(NASA-Case-GSC-12046-1, US-Patent-4,132,599, US-Patent-Appl-SN-680015, US-Patent-Class-195-103.5K US-Patent-Class-195-103.5L) Avail US Patent and Trademark Office CSCL 06A

A method is described for the quick determination of the susceptibilities of various unidentified bacteria contained in an aqueous physiological fluid sample, particularly urine to one or more antibiotics. A bacterial adenosine triphosphate (ATP) assay is carried out after the elimination of non-bacterial ATP to determine whether an infection exists. If an infection does exist, a portion of the sample is further processed including subjecting parts of the portion to one or more antibiotics. Growth of the bacteria in the parts are determined, again by an ATP assay, to determine whether the unidentified bacteria in the sample are susceptible to the antibiotic or antibiotics under test.

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

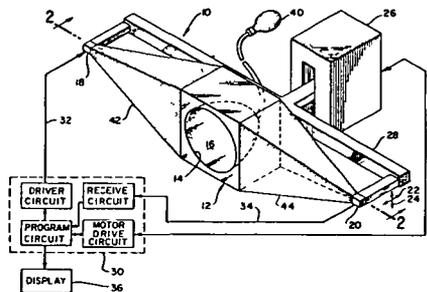
N79-14751* National Aeronautics and Space Administration
Pasadena Office, Calif

COUPLING APPARATUS FOR ULTRASONIC MEDICAL DIAGNOSTIC SYSTEM Patent

Robert E. Frazer, inventor (to NASA) (JPL) Issued 19 Dec 1978 5 p Filed 15 Nov 1976 Supersedes N78-25761 (16 - 16, p 2164) Sponsored by NASA

(NASA-Case-NPO-13935-1, NASA-Case-NPO-13944-1 US-Patent-4,130,112, US-Patent-Appl-SN-741749 US-Patent-Class-128-2V, US-Patent-Class-73-633, US-Patent-Class-73-644) Avail US Patent and Trademark Office CSCL 06B

An apparatus for the ultrasonic scanning of a breast or other tissue is reported that contains a cavity for receiving the breast a vacuum for drawing the breast into intimate contact with the walls of the cavity, and transducers coupled through a fluid to the cavity to transmit sound waves through the breast. Each transducer lies at the end of a tapered chamber which has flexible walls and which is filled with fluid, so that the transducer can be moved in a raster pattern while the chamber walls flex accordingly with sound transmission always occurring through the fluid. Official Gazette of the U.S. Patent and Trademark Office



N79-14755*# National Aeronautics and Space Administration
Ames Research Center, Moffett Field, Calif

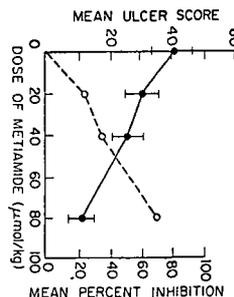
INDOMETHACIN-ANTIHISTAMINE COMBINATION FOR GASTRIC ULCERATION CONTROL Patent Application

Patricia A. Brown (San Jose State Univ., Calif) and Joan Vernikos-Danellis, inventors (to NASA) Filed 29 Dec 1978 19 p

(NASA-Case-ARC-11118-2, US-Patent-Appl-SN-974476) Avail NTIS HC A02/MF A01 CSCL 06E

Gastric ulcers caused by the ingestion of indomethacin by subjects under stress are significantly reduced by administering to the subjects, together or in sequence such antihistaminic drugs as pyrilamine, promethazine, metiamide, or cimetidine. The dosages may range from 25 to 200 mg daily for the indomethacin and from 200 mg to 15 g daily for the antihistamine.

NASA



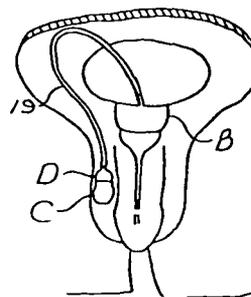
N79-14756*# National Aeronautics and Space Administration
Marshall Space Flight Center, Huntsville, Ala

PROSTHETIC URINARY SPHINCTER Patent Application

Curtis R. Helms and Harold M. Smyly, inventors (to NASA) Filed 12 Oct 1978 11 p (NASA-Case-MFS-23717-1 US-Patent-Appl-SN-950877) Avail NTIS HC A02/MF A01 CSCL 06B

A pump/valve unit which requires a minimum of implant area and surgery is described for controlling bladder function by regulating the inflation and deflation of a urethral collar in a prosthetic urinary sphincter device. The pump has a press bulb of silicone elastomer which provides a reservoir for fluid solution. The valve unit includes a movable member which operates by depression of a flexible portion of the valve unit housing in order to control fluid flow between the reservoir and the collar. A pressure sensing means operates the valve member in order to relieve excess pressure in the collar should too much pressure be applied by the patient.

NASA

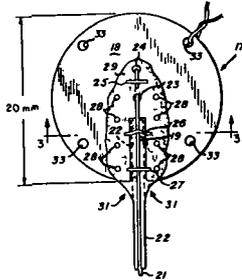


N79-15576* National Aeronautics and Space Administration
Ames Research Center, Moffett Field Calif
IMPROVED SUBCUTANEOUS ELECTRODE STRUCTURE
Patent Application

Gordon F Lund inventor (to NASA) (NAC-NRC) Filed 16 Jan 1979 16 p Sponsored by NASA
(NASA-Case-ARC-11117-1 US-Patent-Appl-SN-003693) Avail NTIS HC A02/MF A01 CSCL 06B

The invention relates in general to a subcutaneous electrode structure useful as a chronic implant for taking electrocardiograms of active animals. The electrode comprises a thin inflexible smooth disc of stainless steel having a diameter as of 5 to 30 millimeters which is sutured in place to the tissue of the animal being monitored by means of a plurality of sutures passing through suture holes in the periphery of the disc. An electrical connection is made to the disc by means of a flexible lead wire that extends longitudinally of radially directed slot in the disc and held there at the terminal end by means of a spotwelded tab. An electrically insulative sleeve, such as silicon rubber, is placed over the wire. The wire with the sleeve is captured in the plane of the disc and within the slot by means of crimping tabs extending laterally across the slot and over the insulated wire.

NASA

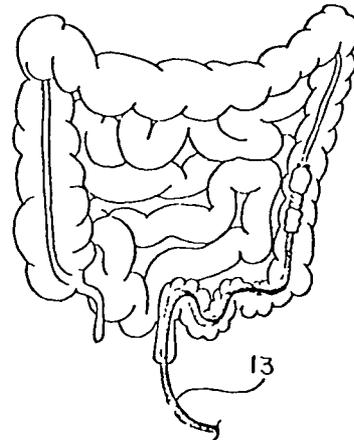


N79-19678* National Aeronautics and Space Administration
Pasadena Office Calif
APPARATUS FOR ENDOSCOPIC EXAMINATION Patent Application

Robert E Frazer inventor (to NASA) (JPL) 17 Jun 1977 20 p Sponsored by NASA
(NASA-Case-NPO-14092-1, US-Patent-Appl-SN-807597) Avail NTIS HC A02/MF A01 CSCL 06B

An endoscope is disclosed having a propulsion mechanism and at least one transmitter at the distal end transmitting bursts of energy waves (radio frequency or ultrasonic) for tracking the position of the distal end through the use of two or more transducers on the anterior or lateral surfaces of a patient. The propulsion mechanism may consist of two radially expandable bladders separated by an axially expandable bellows with only the forward bladder attached to the distal end so that by expanding and contracting them in proper sequence propulsion of the endoscope is achieved. Alternate mechanisms comprise compliant paddles on the distal end directly on an articulated section, or compliant paddles on a rotatable sleeve on the distal end. The endoscope has a sheath which includes material having a sharp melting point slightly above body temperature so that the sheath may be made flexible at selected sections by applying current to separate heating wires in the sections of the sheath.

NASA



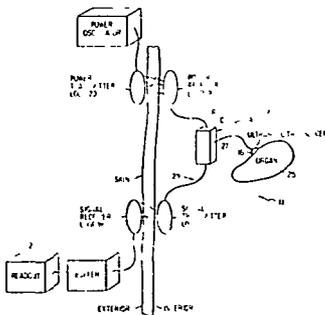
N79-18580* National Aeronautics and Space Administration
Ames Research Center, Moffett Field Calif
MINIATURE IMPLANTABLE ULTRASONIC ECHOSONOMETER Patent

Gilbert K Kojima inventor (to NASA) Issued 29 Aug 1978 7 p Filed 12 Jan 1977 Supersedes N77-15621 (15 - 06 p 20786)

(NASA-Case-ARC-11035-1 US-Patent-4 109 644
US-Patent-Appl-SN-758721 US-Patent-Class-128-2V
US-Patent-Class-128-2 05Z US-Patent-Class-128-2 1A) Avail US Patent and Trademark Office CSCL 06B

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

Official Gazette of the U S Patent and Trademark Office



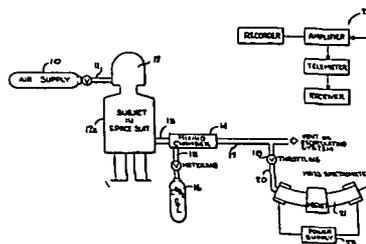
N79-21750* National Aeronautics and Space Administration
Lyndon B Johnson Space Center Houston Tex
METABOLIC RATE METER AND METHOD Patent

Thomas Ivan Taylor (Isomet Corp Palisades Park N J) and Irving Warren Ruderman inventors (to NASA) Issued 13 Aug 1968 3 p Filed 2 Jul 1963 Sponsored by NASA

(NASA-Case-MS-C-12239-1, US-Patent-3 396 719
US-Patent-Appl-SN-292340 US-Patent-Class-128 2 07) Avail US Patent and Trademark Office CSCL 06B

A method is described for measuring the dynamic metabolic rate of a human or animal. The ratio of the exhaled carbon dioxide to a known amount of C(13)O2 introduced into the exhalation is determined by mass spectrometry. This provides an instantaneous measurement of the carbon dioxide generated.

F O S



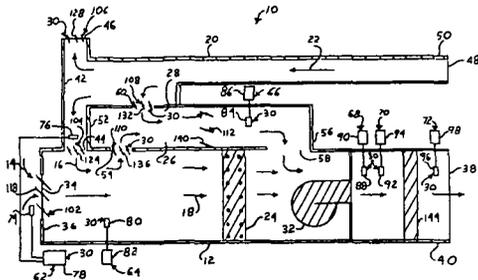
54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering, biotechnology and space suits and protective clothing

N79-19688*# National Aeronautics and Space Administration
Goddard Space Flight Center, Greenbelt, Md
APPARATUS FOR SUPPLYING CONDITIONED AIR AT A SUBSTANTIALLY CONSTANT TEMPERATURE AND HUMIDITY Patent Application

Henry D Obler, inventor (to NASA) Filed 6 Feb 1979 29 p (NASA-Case-GSC-12191-1, US-Patent-Appl-SN-009886) Avail NTIS HC A03/MF A01 CSCL 06K

An air conditioning system is described which does not require expensive and energy consuming equipment to maintain constant air temperature and humidity. A by-pass duct coupled to a supply duct selectively directs proportions of supplied and return conditioned air around a temperature reducing device. Another by-pass duct coupled to the return duct selectively directs portions of the return circulated air around both the supply duct and the temperature reducing device. A controller device selectively regulates the amount of flow and the mixing of the supplied and return conditioned air flowing through the temperature reducing device and within the supply duct, the return duct, and the two by-pass ducts. A circulating mechanism within the supply duct moves the supply air, the return conditioned air, and the conditioned air through the various ducts. The apparatus is designed to uniformly control temperature and humidity in computer facilities. NASA

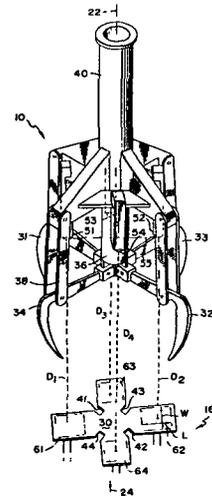


N79-20746*# National Aeronautics and Space Administration
Pasadena Office Calif
TERMINAL GUIDANCE SENSOR SYSTEM Patent Application

Antal K Bejczy, inventor (to NASA) (JPL) Filed 23 Mar 1979 20 p (Contract NAS7-100) (NASA-Case-NPO-14521-1, US-Patent-Appl-SN-023439) Avail NTIS HC A02/MF A01 CSCL 05H

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

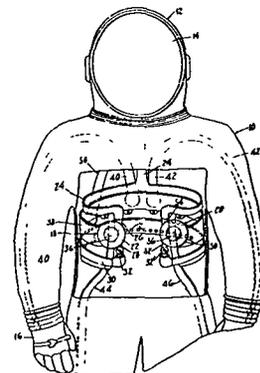
about a corresponding axis with respect to the plane of the grappling fixture NASA



N79-21765* National Aeronautics and Space Administration
Lyndon B Johnson Space Center, Houston, Tex
PROTECTIVE GARMENT VENTILATION SYSTEM Patent

Ronald Lang, inventor (to NASA) (United Aircraft Corp., E Hartford, Conn) issued 6 Jan 1970 8 p Filed 6 Oct 1966 Sponsored by NASA

(NASA-Case-XMS-04928-1, US-Patent-3,487,765, US-Patent-Appl-SN-584914, US-Patent-Class-98-1) Avail US Patent and Trademark Office CSCL 06B
A method of and apparatus for ventilating a protective garment wherein the direction of flow of a ventilating and purging gas within portions of the garment may be reversed in order to compensate for changes in environment and activity of the wearer, is presented. The method and apparatus also contemplates the establishment of a condition wherein the entire flow of ventilating gas is first directed to a helmet associated with the garment. Official Gazette of the U S Patent and Trademark Office



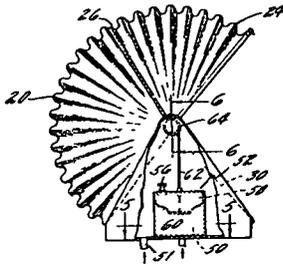
N79-21786* National Aeronautics and Space Administration
Marshall Space Flight Center, Huntsville, Ala

EMERGENCY SPACE-SUIT HELMET Patent

Harvey A Smith inventor (to NASA) (United Aircraft Corp E Hartford, Conn) issued 2 Jun 1970 4 p Filed 24 Feb 1966 Sponsored by NASA

(NASA-Case-XMS-04673-1, US-Patent-3 514 785, US-Patent-Appl-SN-529884, US-Patent-Class-2-2 1) Avail US Patent and Trademark Office CSCL 06B

A collapsible automatically extensible, emergency space helmet is described The unit when deflated is carried on the back of the wearer, attached to the suit, so as not to interfere with normal activities When inflated the head of the wearer is completely incapsulated FOS



N79-20751* National Aeronautics and Space Administration
Pasadena Office, Calif

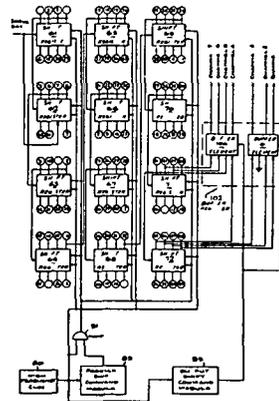
DIGITAL DATA REFORMATTER/DESERIALIZER Patent

Alexander Engel (JPL) and L Richard Springer inventors (to NASA) (JPL) issued 13 Feb 1979 9 p Filed 18 Mar 1977 Supersedes N77-24781 (15 - 15, p 2034) Sponsored by NASA

(NASA-Case-NPO-13676-1, US-Patent-4,139,839, US-Patent-Appl-SN-779415, US-Patent-Class-340-347DD, US-Patent-Class-364-900) Avail US Patent and Trademark Office CSCL 09B

A method and apparatus is presented for reformatting and de-serializing a serially-received sequence of data words each consisting of a fixed number of binary data bits A block of nm bits is serially fed into a shift register or serially-connected group of shift registers In lieu of the(nm-1)th shifts the bits are rearranged within the shift register in parallel fashion, according to a prescribed scheme Shifting then continues, until the first bit of each data word appears in the last bit position in the shift register at which time that data word is shifted in parallel into an output buffer stage from which it is outputted in parallel, after a fixed delay

Official Gazette of the U S Patent and Trademark Office



60 COMPUTER OPERATIONS AND HARDWARE

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

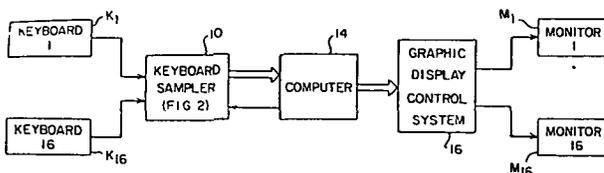
N79-14797*# National Aeronautics and Space Administration
Pasadena Office, Calif

HIGH-SPEED MULTIPLEXING OF KEYBOARD DATA INPUTS Patent Application

Tage O Anderson inventor (to NASA) (JPL) Filed 29 Dec 1978 18 p Sponsored by NASA (Contract NAS7-100)

(NASA-Case-NPO-14554-1 US-Patent-Appl-SN-974473) Avail NTIS HC A02/MF A01 CSCL 09B

A method and apparatus are provided for a high speed multiplexing system in which keyboard entered data is sequentially and automatically sampled by a multiplexer for input to a computer A sequencer is provided which sequentially and automatically controls the multiplexer so that each keyboard data input is sampled in accordance with a predetermined sampling NASA



71 ACOUSTICS

Includes sound generation transmission and attenuation

For noise pollution see 45 Environment Pollution

N79-14871* National Aeronautics and Space Administration
Lewis Research Center Cleveland, Ohio

SOUND-SUPPRESSING STRUCTURE WITH THERMAL RELIEF Patent

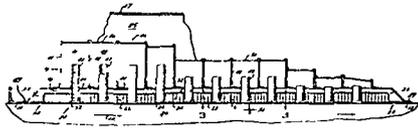
Dudley O Nash (GE, Cincinnati) and Joseph Holowach, inventors (to NASA) issued 15 Aug 1978 5 p Filed 2 Jul 1976 Sponsored by NASA

(NASA-Case-LEW-12658-1, US-Patent-4,106,587, US-Patent-Appl-SN-702115, US-Patent-Class-181-213, US-Patent-Class-181-222, US-Patent-Class-181-190, US-Patent-Class-181-293) Avail US Patent and Trademark Office CSCL 20A

Sound-suppressing structure comprising stacked acoustic panels wherein the inner high frequency panel is mounted for thermal expansion with respect to the outer low frequency panel is discussed Slip joints eliminate the potential for thermal stresses, and a thermal expansion gap between the panels provides for

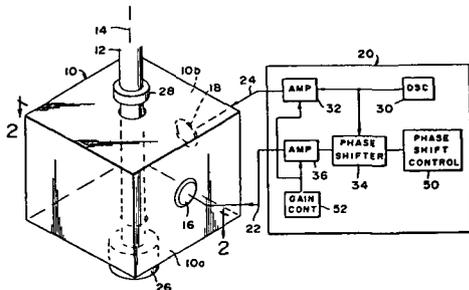
71 ACOUSTICS

additional relative thermal growth while reducing heat convection into the low frequency panel
 Official Gazette of the U S Patent and Trademark Office



N79-20827* National Aeronautics and Space Administration Pasadena Office, Calif
ACOUSTIC DRIVING OF ROTOR Patent
 Hilda Kanber (JPL), Isadore Rudnick (JPL), and Taylor G Wang inventors (to NASA) (JPL) Issued 13 Feb 1979 4 p Filed 5 Jul 1977 Supersedes N78-22859 (16 - 13 p 1773) Sponsored by NASA
 (NASA-Case-NPO-14005-1 US-Patent-4,139 806
 US-Patent-Appl-SN-812447, US-Patent-Class-318-116,
 US-Patent-Class-60-721 US-Patent-Class-73-505
 US-Patent-Class-310-322, US-Patent-Class-310-334,
 US-Patent-Class-310-20, US-Patent-Class-310-26) Avail US Patent and Trademark Office CSCL 20A

Sound waves are utilized to apply torque to a body in an enclosure of square cross section, by driving two transducers located on perpendicular walls of an enclosure at the same frequency but at a predetermined phase difference such as 90 degrees The torque is a first order effect so that large and controlled rotational speeds can be obtained
 Official Gazette of the U S Patent and Trademark Office



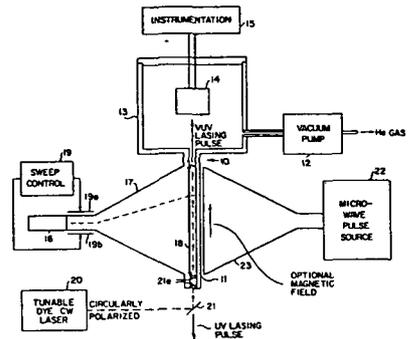
72 ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure and molecular spectra

N79-13826* National Aeronautics and Space Administration Pasadena Office, Calif
STABILIZATION OF He2(a 3 SIGMA u+ MOLECULES IN LIQUID HELIUM BY OPTICAL PUMPING FOR VACUUM UV LASER 6 Patent
 Jonas S Zmuidzinas, inventor (to NASA) (JPL) Issued 15 Aug 1978 5 p Filed 29 Mar 1977 Supersedes N77-24468 (15 - 15, p 1994) Sponsored by NASA

(NASA-Case-NPO-13993-1, US-Patent-4,107,627, US-Patent-Appl-SN-782463, US-Patent-Class-331-94 5PE, US-Patent-Class-331-94 5L, US-Patent-Class-331-94 5P) Avail US Patent and Trademark Office CSCL 20H

A technique is disclosed for achieving large populations of metastable spin-aligned He2(a 3 Sigma u+) molecules in superfluid helium to obtain lasing in the vacuum ultraviolet wavelength regime around 0.0800 micron m by electronically exciting liquid (superfluid) helium with a comparatively low-current electron beam and spin aligning the metastable molecules by means of optical pumping with a modestly-powered (100mW) circularly-polarized continuous wave laser operating at, for example, 0.9096 or 0.4650 micron m Once a high concentration of spin-aligned He2 (a 3 Sigma u+) is achieved with lifetimes of a few milliseconds, a strong microwave signal destroys the spin alignment and induces a quick collisional transition of He2 (a 3 Sigma u+) molecules to the a 1 Sigma u+ state and thereby a lasing transition to the X 1 Sigma g+ state
 Official Gazette of the U S Patent and Trademark Office



74 OPTICS

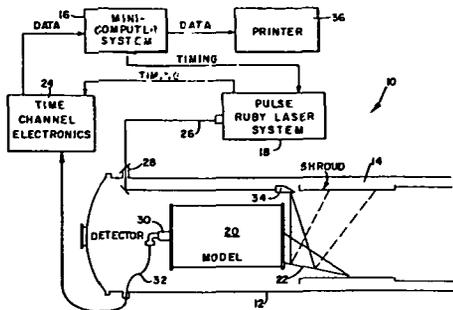
Includes light phenomena

N79-11865* National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville Ala
SYSTEM FOR THE MEASUREMENT OF ULTRA-LOW STRAY LIGHT LEVELS Patent
 Charles L Wyman, Donald B Grner, William A Hurd (Sperry Rand Corp, Huntsville Ala), Glenn B Shelton (Sperry Rand Corp, Huntsville Ala), Gary H Hunt (Sperry Rand Corp, Huntsville Ala), Bill B Fannin (Ariz Univ Tucson), Robert P Brealt (Ariz Univ Tucson) and Charles A Hawkins inventors (to NASA) Issued 25 Jul 1978 9 p Filed 29 Dec 1976 Supersedes N77-14842 (15 - 05 p 0675)
 (NASA-Case-MFS-23513-1 US-Patent-4,102 580
 US-Patent-Appl-SN-755323 US-Patent-Class-356-210
 US-Patent-Class-356-124) Avail US Patent Office CSCL 20F

An apparatus is described for measuring the effectiveness of stray light suppression light shields and baffle arrangements used in optical space experiments and large space telescopes The light shield and baffle arrangement and a telescope model are contained in a vacuum chamber A source of short high-powered light energy illuminates portions of the light shield and baffle arrangement and reflects a portion of same to a photomultiplier tube by virtue of multipath scattering The resulting signal is transferred to time-channel electronics timed by the firing of the high energy light source allowing time discrimination of the signal thereby enabling the light scattered and

suppressed by the model to be distinguished from the walls and holders around the apparatus

Official Gazette of the U S Patent Office



US-Patent-Class-200-61 US-Patent-Class-200-46
US-Patent-Class-250-214AL US-Patent-Class-315-153) Avail
US Patent and Trademark Office CSCL 20F

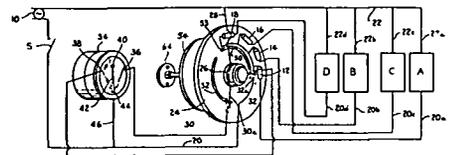
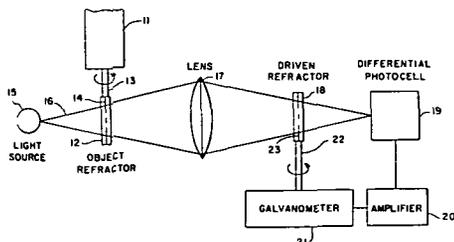
An illumination control apparatus is presented for supplementing light from solar radiation with light from an artificial light source to compensate for periods of insufficient levels of solar light. The apparatus maintains a desired illumination level within an interior space comprising an artificial light source connected to an electrical power source with a switch means for selectively energizing said light source. An actuator means for controlling the on-off operation of the switch means is connected to a light sensor which responds to the illumination level of the interior space. A limit switch carried adjacent to the actuator limits the movement of the actuator within a predetermined range so as to prevent further movement thereof during detection of erroneous illumination conditions.

Official Gazette of the U S Patent and Trademark Office

N79-11866* National Aeronautics and Space Administration
Langley Research Center Hampton, Va
NONCONTACTING METHOD FOR MEASURING ANGULAR DEFLECTION Patent Application
Emmett L Bryant, inventor (to NASA) Filed 23 Oct 1978
8 p
(NASA-Case-LAR-12178-1, US-Patent-Appl-SN-953390) Avail
NTIS HC A02/MF A01 CSCL 20F

An electro-optical means for measuring instantaneous angular deflections of an object without requiring mechanical contact with the object is described. A flat refractor is attached to the object whose angular deflections are to be measured. Light from a light source is passed through the first refractor onto a converging lens which converges the light through a second refractor onto a differential photocell. The output of the differential photocell is applied through a high gain amplifier to a galvanometer which is attached to the second refractor so that it rotates about an axis that is parallel to the axis of the first refractor. Any deflection of the object about the axis of the first refractor generates a current at the output of the photocell causing the galvanometer to rotate the second refractor to make the output of the photocell approach zero. This results in the galvanometer current being substantially proportional to the angular deflection of the object.

NASA



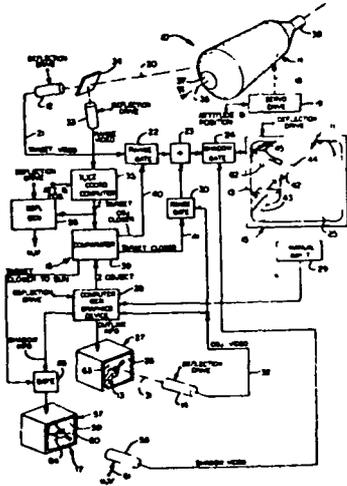
N79-13855* National Aeronautics and Space Administration
Marshall Space Flight Center, Huntsville, Ala
SIMULATOR METHOD AND APPARATUS FOR PRACTICING THE MATING OF AN OBSERVER-CONTROLLED OBJECT WITH A TARGET Patent
Walter K Polstorff Issued 15 Aug 1978 10 p Filed 25 Feb 1977 Supersedes N77-18179 (15 - 09, p 1139) Continuation-in-part of abandoned US Patent Appl SN-590183 filed 25 Jun 1975
(NASA-Case-MFS-23052-2, US-Patent-4 106,218, US-Patent-Appl-SN-772165 US-Patent-Class-35-12C, US-Patent-Class-35-12N, US-Patent-Class-358-104, US-Patent-Appl-SN-590183) Avail US Patent and Trademark Office CSCL 20F

A servo controlled target replica, and a surface bearing a computer generated line drawing of an object are individually viewed by separate television cameras allowing a two-dimensional composite of the target replica and the object to be displayed on a monitor simulating what an observer would see through a window in a spacecraft. The target replica is coded along one self coordinate axis in such a way that the distance of an elemental area on the target along the axis is capable of being remotely readout by a television camera. A third television camera responsive to the code reads out this information by which the Z-coordinate, relative to the observer

N79-12890* National Aeronautics and Space Administration
John F Kennedy Space Center Cocoa Beach, Fla
ILLUMINATION CONTROL APPARATUS FOR COMPENSATING SOLAR LIGHT Patent
Lester J Owens, inventor (to NASA) Issued 24 Oct 1978
8 p Filed 23 Dec 1976 Supersedes N77-15493 (15 - 06 p 0769)
(NASA-Case-KSC-11010-1 US-Patent-4 122,334 US-Patent-Appl-SN-753977, US-Patent-Class-250-214R,

74 OPTICS

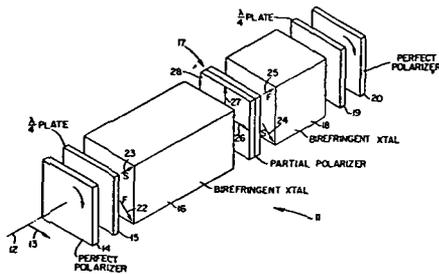
can be calculated, on-line with the scan, for the contents of each picture element of the scene televised by the target camera Official Gazette of the U S Patent and Trademark Office



N79-14891* National Aeronautics and Space Administration
Goddard Space Flight Center, Greenbelt Md
PARTIAL POLARIZER FILTER Patent
Alan M Title inventor (to NASA) (Lockheed Missiles and Space Co., Sunnyvale Calif) Issued 12 Dec 1978 6 p Filed 11 Aug 1977 Supersedes N77-30935 (15 - 21, p 2865) Sponsored by NASA
(NASA-Case-GSC-12225-1, US-Patent-4,129 357 US-Patent-Appl-SN-823566, US-Patent-Class-350-157) Avail US Patent and Trademark Office CSCL 20F

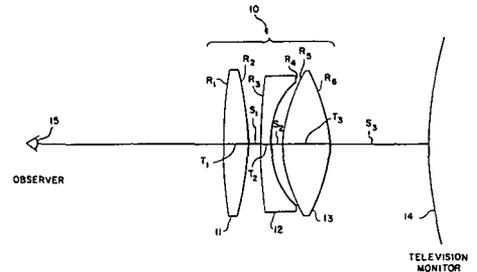
A birefringent filter module comprises, in *seriatim* (1) an entrance polarizer (2) a first birefringent crystal responsive to optical energy exiting the entrance polarizer (3) a partial polarizer responsive to optical energy exiting the first polarizer (4) a second birefringent crystal responsive to optical energy exiting the partial polarizer, and (5) an exit polarizer. The first and second birefringent crystals have fast axes disposed + or -45 deg from the high transmittivity direction of the partial polarizer. Preferably, the second crystal has a length 1/2 that of the first crystal and the high transmittivity direction of the partial polarizer is nine times as great as the low transmittivity direction. To provide tuning the polarizations of the energy entering the first crystal and leaving the second crystal are varied by either rotating the entrance and exit polarizers, or by sandwiching the entrance and exit polarizers between pairs of half wave plates that are rotated relative to the polarizers. A plurality of the filter modules may be cascaded

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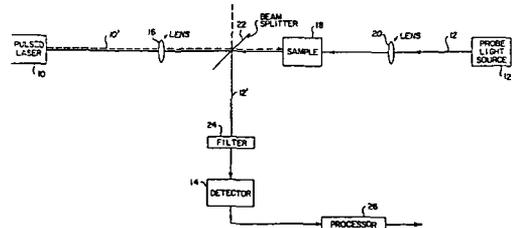
N79-14892*# National Aeronautics and Space Administration
Langley Research Center, Hampton, Va
CHROMATICALLY CORRECTED VIRTUAL IMAGE DISPLAY Patent Application
William M Kahlbaum, Jr inventor (to NASA) Filed 23 Oct 1978 8 p
(NASA-Case-LAR-12251-1, US-Patent-Appl-SN-953389) Avail NTIS HC A02/MF A01 CSCL 20F

An in-line optical display lens comprising a front convex-convex element a central convex-concave element, and a rear convex-convex element was designed for use in the flight simulators, which require presentation of a realistic visual display to the pilot operating the flight simulator. The lens, located between the pilot operating the simulator and a closed circuit television monitor or similar device, serves to magnify the image and causes the image to appear to be at a distance. The specific radius of curvature of the lens elements precise lens element spacing and thickness and the indices of refraction for the lens elements, relieve eye strain on a pilot during operation of a flight simulator. The use of acrylic and polystyrene elements results in a lens that is both lighter in weight and less expensive than similar lens made with glass elements NASA



N79-17683*# National Aeronautics and Space Administration
Pasadena Office Calif
DOUBLE-BEAM OPTICAL METHOD AND APPARATUS FOR MEASURING THERMAL DIFFUSIVITY AND OTHER MOLECULAR DYNAMIC PROCESSES IN UTILIZING THE TRANSIENT THERMAL LENS EFFECT Patent Application
Jovan Moacanin (JPL), Amitava Gupta (JPL), and Su-Don Hong inventors (to NASA) (JPL), and Su-Don Hong (Contract NAS7-100) Filed 31 Jan 1979 24 p
(NASA-Case-NPO-14657-1, US-Patent-Appl-SN-008211) Avail NTIS HC A02/MF A01 CSCL 20F

Thermal diffusivity and molecular relaxation processes in a sample material are measured by using a pulsed laser light beam which forms a thermal lens in the sample material, and a relatively low power probe light beam which detects changes in the refractive index of the sample material during formation and dissipation of the thermal lens. By integrating a large number of successive formation and dissipation cycles, a composite curve can be developed and used to accurately determine thermal diffusivity and molecular relaxation characteristics of the sample material. The use of thermo-optical techniques provides a means for conducting nondestructive tests using both isotropic and anisotropic materials which can be either transparent or opaque to the light sources being utilized. Thermal diffusivity and molecular relaxation characteristics can be measured using a sample undergoing stress test or a sample which is shock-sensitive NASA

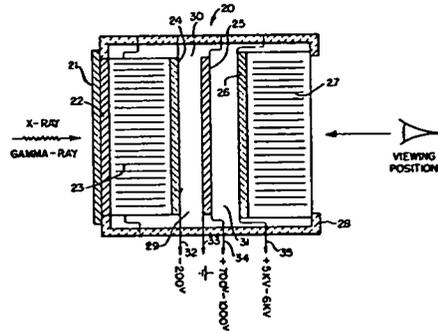


N79-20856* National Aeronautics and Space Administration Pasadena Office Calif
SYSTEM AND METHOD FOR OBTAINING WIDE SCREEN SCHLIEREN PHOTOGRAPHS Patent
 Shakkottar P Parthasarathy inventor (to NASA) (JPL) Issued 13 Feb 1979 4 p Filed 9 Feb 1978 Supersedes N78-18396 (16 - 09 p 1160) Sponsored by NASA (NASA-Case-NPO-14174-1 US-Patent-4,139,291, US-Patent-Appl-SN-876441, US-Patent-Class-354-77 US-Patent-Class-250-237G, US-Patent-Class-356-129) Avail US Patent and Trademark Office CSCL 20F

A system for use in Schlieren photography includes (1) a viewing screen adjacently related to a large grating, (2) a small grating disposed in spaced relation with the large grating (3) a transparent retainer for confining a transparent medium between the gratings, and (4) optics for imaging the small grating on the large grating A light source and optically aligned lens are used to project a beam of light along axes extending through the small grating and strike the large grating subsequent to passing through the medium A Schlieren image of striations resulting from distortions of light rays proposed by the medium are formed on the screen A camera is used to photograph the Schlieren image projected on the large screen

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its own radiation source or used with an independent source
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75 PLASMA PHYSICS

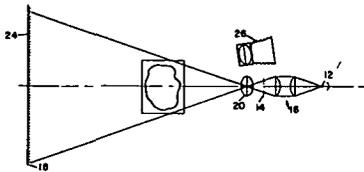
Includes magnetohydrodynamics and plasma fusion
 For ionospheric plasmas see 46 Geophysics For space plasmas see 90 Astrophysics

N79-10894*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio
HYDROGEN HOLLOW CATHODE ION SOURCE Patent Application

M Mirtich J Sovey and R Roman inventors (to NASA) 23 Oct 1978 8 p (NASA-Case-LEW-12940-1, US-Patent-Appl-SN-953391) Avail NTIS HC A02/MF A01 CSCL 20I

A hydrogen source is disclosed which 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 placed 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 The source provides hydrogen or deuterium ions at a beam current density exceeding 0.1 amperes (A)/sq cm and has a discharge current which can exceed 100A for duty cycles of several minutes

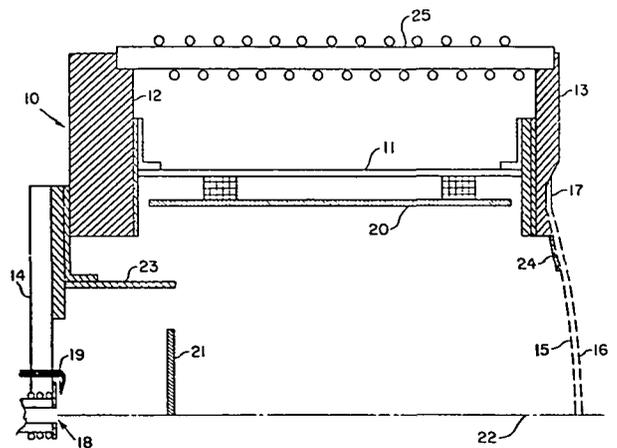
NASA



N79-20857* National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt Md
LOW INTENSITY X-RAY AND GAMMA-RAY IMAGING DEVICE Patent

Lo I Yin, inventor (to NASA) Issued 27 Feb 1979 9 p Filed 20 Jul 1977 Supersedes N77-29471 (15 - 20, p 2674) (NASA-Case-GSC-12263-1, US-Patent-4,142,101 US-Patent-Appl-SN-817415, US-Patent-Class-250-363R, US-Patent-Class-250-483) Avail US Patent and Trademark Office CSCL 20F

A radiation to visible light converter is combined with a visible light intensifier The converter is a phosphor or scintillator material which is modified to block ambient light The intensifier includes fiber optics input and output face plates with a photocathode-microchannel plate amplifier-phosphor combination Incoming radiation is converted to visible light by the converter which is piped into the intensifier by the input fiber optics face plate The photocathode converts the visible light to electrons which are amplified by a microchannel plate amplifier The electrons are converted back to light by a phosphor layer and piped out for viewing by the output fiber optics faces plate The converter-intensifier combination may be further combined with



76 SOLID-STATE PHYSICS

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

N79-10917*# National Aeronautics and Space Administration Pasadena Office Calif

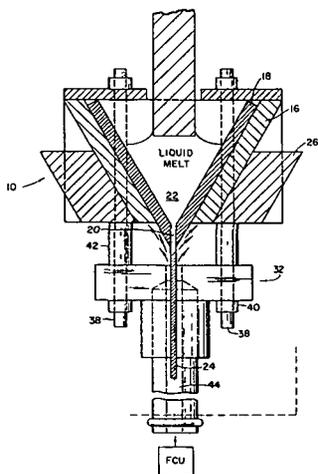
A METHOD AND MEANS FOR GROWING RIBBON CRYSTALS WITHOUT SUBJECTING THE CRYSTALS TO THERMAL SHOCK-INDUCED STRAINS Patent Application

Samuel Berkman (RCA Corp Princeton, N J) Harold E Temple (RCA Corp Princeton N J) and Kyong-Min Kim inventors (to NASA) (RCA Corp Princeton, N J) Filed 31 Aug 1978 12 p

(Contract JPL-954465)

(NASA-Case-NPO-14298-1 US-Patent-Appl-SN-938579) Avail NTIS HC A02/MF A01 CSCL 20B

A susceptor particularly suited for use in growing crystal ribbons is described which employs edge-defined film-fed growth techniques and is characterized by a die through which a melt is drawn for forming a crystal ribbon. A pair of jets are adjacently related to the die for directing streams of fluid coolant along paths extended to impinge on the susceptor in close proximity with the die but in non-incident relation with the crystal ribbon being formed. The growth of a crystal is stabilized without subjecting the resulting crystal to strain-inducing effects of thermal shock. NASA



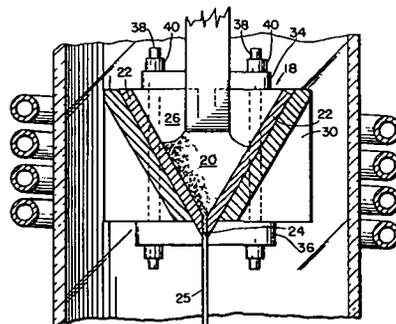
N79-10918*# National Aeronautics and Space Administration Pasadena Office Calif

AN IMPROVED APPARATUS FOR USE IN THE PRODUCTION OF RIBBON-SHAPED CRYSTALS FROM A SILICON MELT Patent Application

Samuel Berkman (RCA Corp Princeton, N J) and Harold E Temple inventors (to NASA) (RCA Corp Princeton, N J) Filed 31 Aug 1978 12 p (Contract JPL-954465)

(NASA-Case-NPO-14297-1 US-Patent-Appl-SN-938299) Avail NTIS HC A02/MF A01 CSCL 20B

An apparatus employed in the production of ribbon-shaped crystals is characterized by an R-F coil, a crucible for confining a silicon melt, and a susceptor for supporting the crucible and facilitating an electrical coupling of the coil with the melt. The susceptor comprises a pair of susceptor halves of a thickness less than two skin depths each being the mirror image of the other disposed in mutually opposed electrically insulated relation, while the crucible comprises a quartz body including side plates and end plates supported by the graphite susceptor whereby the R-F coil is electrically coupled with the melt. A higher average temperature is attained for the melt than that attained for the susceptor walls so that thermal gradients are easier to control and the input energy to the system is conserved. NASA



N79-11920* National Aeronautics and Space Administration Pasadena Office Calif

METHOD OF CONTROLLING DEFECT ORIENTATION IN SILICON CRYSTAL RIBBON GROWTH Patent

Martin H Leopold inventor (to NASA) (JPL) Issued 24 Oct 1978 4 p Filed 16 Jul 1976 Supersedes N78-23969 (16 - 14 p 1921) Sponsored by NASA

(NASA-Case-NPO-13918-1 US-Patent-4 121 965

US-Patent-Appl-SN-706073 US-Patent-Class-156-608

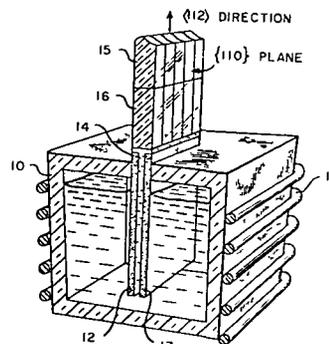
US-Patent-Class-156-617SP US-Patent-Class-156-DIG 64

US-Patent-Class-156-DIG 65 US-Patent-Class-156-DIG 88)

Avail US Patent Office CSCL 20B

The orientation of twinning and other effects in silicon crystal ribbon growth is controlled by use of a starting seed crystal having a specific (110) crystallographic plane and (112) crystallographic growth direction.

Official Gazette of the U S Patent Office



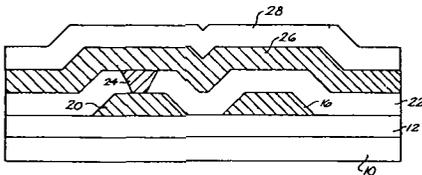
N79-14908* National Aeronautics and Space Administration
Marshall Space Flight Center, Huntsville Ala
MULTILEVEL METALLIZATION METHOD FOR FABRICATING A METAL OXIDE SEMICONDUCTOR DEVICE

Patent
Ben R Hollis, Jr William R Feltner, David L Bouldin, and Donald E Routh inventors (to NASA) Issued 5 Sep 1978 8 p Filed 8 Jul 1977 Supersedes N77-27308 (15 - 18 p 2377)

(NASA-Case-MFS-23541-1 US-Patent-4 111,775
US-Patent-Appl-SN-814005, US-Patent-Class-204-192C) Avail
US Patent and Trademark Office CSCL 20L

An improved method is described of constructing a metal oxide semiconductor device having multiple layers of metal deposited by dc magnetron sputtering at low dc voltages and low substrate temperatures. The method provides multilevel interconnections and cross over between individual circuit elements in integrated circuits without significantly reducing the reliability or seriously affecting the yield

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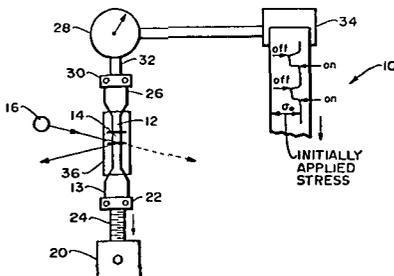
N79-14908*# National Aeronautics and Space Administration
Pasadena Office Calif

PHOTOMECHANICAL TRANSDUCER Patent Application
Robert F Fedors (JPL) and Mohammad N Sarbolouki, inventors (to NASA) (JPL) Filed 15 Dec 1978 14 p
(Contract NAS7-100)

(NASA-Case-NPO-14363-1 US-Patent-Appl-SN-969760) Avail
NTIS HC A02/MF A01 CSCL 20L

A single low cost, non-electrical photomechanical transducer is described which comprises an ultrathin strip of polymeric or metallic film having an efficient absorptive surface. When the strip is held under small and constant strain in a stress-strain analyzer, the strip responds to light in a quick and reversible manner. The absorptive face of a rectangular test strip is mounted toward an illumination source. One end of the strip is clamped and screwed to a movable support, the other is attached to a strain gage by a clamp and a lead. The strain gage is connected to a chart recorder which contains typical amplification and graphic instrumentation. A mask placed across the strip provides a controlled illumination area. Many different measuring switching and prime mover devices can be constructed based on this simple transduction

NASA



N79-16678* National Aeronautics and Space Administration
Pasadena Office Calif

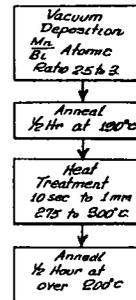
MANGANESE BISMUTH FILMS WITH NARROW TRANSFER CHARACTERISTICS FOR CURIE-POINT SWITCHING

Patent
George W Lewicki (JPL) and John E Guisinger inventors (to NASA) (JPL) Issued 24 Sep 1974 9 p Filed 1 Nov 1972
Continuation-in-part of abandoned US Patent Appl SN-57439
filed 23 Jul 1970 sponsored by NASA

(NASA-Case-NPO-11336-1, NASA-Case-NPO-13247-1
US-Patent-3 837,908, US-Patent-Appl-SN-302913
US-Patent-Class-117-239, US-Patent-Class-75-134D,
US-Patent-Class-117-107 US-Patent-Class-117-119
US-Patent-Class-117-234 US-Patent-Class-117-235
US-Patent-Class-117-237, US-Patent-Class-117-240
US-Patent-Class-148-6 US-Patent-Class-148-121) Avail US
Patent and Trademark Office CSCL 20L

Manganese bismuth films having improved characteristics for recording information in analogue form, can be produced by a vacuum deposition of Bi and Mn with an atomic ratio of Mn to Bi between 2 and 3.5 or 1.4 and 1.6, followed by a specialized heat treatment which includes very brief exposure to a temperature between about 275 deg and 300 C. Similar MnBi films can be produced more reliably and reproducibly if the initial Bi layer is annealed prior to deposition of the Mn layer. Such an annealing step renders most other factors of the processing relatively non-critical. Deposition of both initial layers is preferably carried out in a vacuum approaching 10 to the -8th power Torr

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N79-21910* National Aeronautics and Space Administration
Lewis Research Center, Cleveland, Ohio

METHOD FOR THE PREPARATION OF INORGANIC SINGLE CRYSTAL AND POLYCRYSTALLINE ELECTRONIC MATERIALS

Patent
Warren O Groves, inventor (to NASA) (Monsanto Co, St Louis, Mo) Issued 25 Feb 1969 3 p Filed 5 Feb 1965 Sponsored by NASA

(NASA-Case-XLE-02545-1, US-Patent-3 429,756
US-Patent-Appl-SN-430748 US-Patent-Class-156-17) Avail
US Patent and Trademark Office CSCL 20B

Large area semiconductor crystals selected from group 3-5 compounds and alloys are provided for semiconductor device fabrication by the use of a selective etching operation which completely removes the substrate on which the desired crystal was deposited. The substrate selected from the same group as the single crystal, has a higher solution rate than the epitaxial single crystal which is essentially unaffected by the etching solution. The preparation of gallium phosphide single crystals using a gallium arsenide substrate and a concentrated nitric acid etching solution is described

A R H

85 URBAN TECHNOLOGY AND TRANSPORTATION

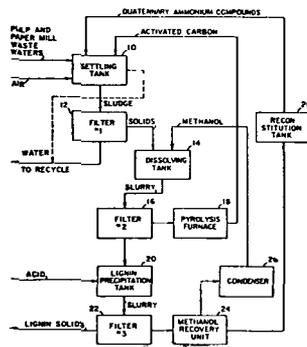
Includes applications of space technology to urban problems technology transfer technology assessment and surface and mass transportation

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

N79-17747* National Aeronautics and Space Administration Pasadena Office, Calif
PROCESS FOR PURIFICATION OF WASTE WATER PRODUCED BY A KRAFT PROCESS PULP AND PAPER MILL Patent

Marshall F Humphrey, inventor (to NASA) (JPL) Issued 16 Jan 1979 6 p Filed 15 Dec 1976 Supersedes N77-17949 (15 - 08, p 1101) Sponsored by NASA (NASA-Case-NPO-13847-2, NASA-Case-NPO-13848-2 US-Patent-4,134,786 US-Patent-Appl-SN-750798, US-Patent-Class-162-14 US-Patent-Class-162-29 US-Patent-Class-210-28, US-Patent-Class-210-40, US-Patent-Class-210-45, US-Patent-Class-210-54, US-Patent-Class-210-66, US-Patent-Class-210-67, US-Patent-Class-210-70, US-Patent-Class-210-73R) Avail US Patent and Trademark Office CSCL 13B

The water from paper and pulp wastes obtained from a mill using the Kraft process is purified by precipitating lignins and lignin derivatives from the waste stream with quaternary ammonium compounds, removing other impurities by activated carbon produced from the cellulosic components of the water and then separating the water from the precipitate and solids. The activated carbon also acts as an aid to the separation of the water and solids. If recovery of lignins is also desired, then the precipitate containing the lignins and quaternary ammonium compounds is dissolved in methanol. Upon acidification, the lignin is precipitated from the solution. The methanol and quaternary ammonium compound are recovered for reuse from the remainder. Official Gazette of the U S Patent and Trademark Office



89 ASTRONOMY

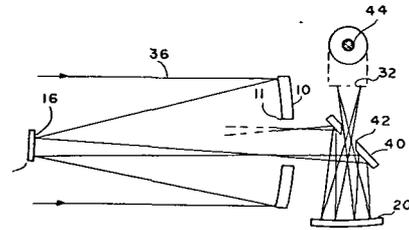
Includes radio and gamma-ray astronomy, celestial mechanics and astrometry

N79-10969* National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville Ala
ANASTIGMATIC THREE-MIRROR TELESCOPE Patent
 Dietrich G Korsch inventor (to NASA) (Sperry Rand Corp Huntsville Ala) Issued 18 Jul 1978 6 p Filed 29 Jul 1977 Supersedes N77-28937 (15 - 19, p 2599) Sponosred by NASA

(NASA-Case-MFS-23675-1 US-Patent-4,101 195 US-Patent-Appl-SN-820498 US-Patent-Class-350-55 US-Patent-Class-350-294) Avail US Patent Office CSCL 20F

A three-mirror telescope for extraterrestrial observations is described. An ellipsoidal primary mirror, a hyperbolic secondary mirror and an ellipsoidal tertiary mirror produce an image in a conveniently located finite plane for viewing.

Official Gazette of the U S Patent Office



99 GENERAL

N79-10995*# National Aeronautics and Space Administration Hugh L Dryden Flight Research Center Edwards, Calif
ANTI-AIRCRAFT SYSTEM AND METHOD EMPLOYING SMALL PROJECTILES Patent Application
 Ming H Tang inventor (to NASA) Filed 14 Feb 1978 16 p (NASA-Case-FRC-11006-1, US-Patent-Appl-SN-877786) Avail NTIS HC A02/MF A01 CSCL 15C

A system and method are presented for disabling low flying aircrafts without the need to aim destructive matter at the aircrafts. The novelty of the invention is believed to be based on the dispersion of elements in an airspace which an acquired aircraft has to traverse, without having to aim the elements at the specific aircraft. The elements by coming in contact with the aircraft, contribute to its destruction. NASA



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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 240 patents and applications for patent introduced into the NASA scientific and technical information system during the period of January 1979 through June 1979. Each entry of the Abstract Section consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or application for patent.			
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