NASA SP-7039(13)
Section 1
Abstracts

NASA SP-7039 (13) NASA Patent Abstracts Bibliography (Sect. 1 • Abstracts) JULY 1978

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

JULY 1978

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ACCESSION NUMBER RANGES

Bibliography Number	*STAR Accession Numbers*
NASA SP-7039(04)	N69-20701–N73-33931
NASA SP-7039(12)	N74-10001–N77-34042
NASA SP-7039(13)	N78-10001–N78-22018

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NASA SP-7039(13)
Section 1
Abstracts

NASA

PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

Annotated references to NASA-owned inventions covered by U S patents and applications for patent that were announced in *Scientific and Technical Aerospace Reports (STAR)* between January 1978 and June 1978.

Scientific and Technical Information Office JULY 1978
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D C

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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 May 1969 Thus a complete set of *NASA PAB* would consist of the Abstract Sections of Issue 04 (January 1974) and Issue 12 (January 1978) and the Abstract and Index Sections for this issue

The 161 citations published in this issue of the Abstract Section cover the period January 1978 through June 1978 The Index Section contains references to the 3386 citations covering the period May 1969 through June 1978

ABSTRACT SECTION (SECTION 1)

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

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

NASA Accession Number
NASA Case Number
Inventor's Name

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

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

TYPICAL CITATION AND ABSTRACT

NASA SPONSORED DOCUMENT

AVAILABLE ON MICROFICHE

NASA ACCESSION NUMBER

N78-19166*# National Aeronautics and Space Administration Hugh L Dryden Flight Research Center Edwards Calif

SOURCE

TITLE

A PORTABLE DEVICE PARTICULARLY SUITED FOR USE IN STARTING AIR-START UNITS FOR AIRCRAFT Patent Application

INVENTOR

William R Rosier and George C Volk inventors (to NASA) Filed 9 Mar 1978 15 p
(Contract NAS4-2272)

US PATENT APPLICATIONS SERIAL NUMBER

NASA CASE NUMBER

(NASA-Case-FRC-10113-1 US-Patent-Appl-SN-885066) Avail NTIS HC A02/MF A01 CSCL 01E

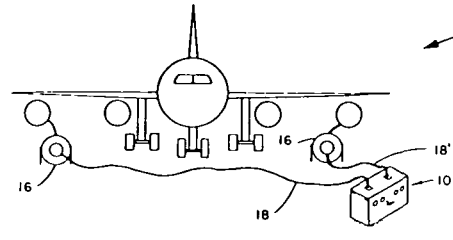
AVAILABILITY

COSATI CODE

ABSTRACT

The invention is embodied in a device including (1) a DC circuit having a pair of terminal plugs each plug being characterized by a first second and third terminal (2) a pair of manually operable switches for connecting the first terminal of each of the plugs to the positive side of a voltage source (3) a circuit lead connecting the second terminal of each plug to the negative side of said source (4) a pair of electrical cables adapted to connect the first and second terminals of each plug to an air-start unit (5) means for connecting each of the cables between the first terminal of one plug and the third terminal of the other plug of the pair and (6) a second pair of manually operable switches for selectively connecting the third terminal of each plug of the pair to the negative side of the voltage source whereby electrical continuity of each cable of the pair may be examined prior to being connected to an air-start unit NASA

KEY ILLUSTRATION



INDEX SECTION (SECTION 2)

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

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

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

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

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

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

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

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

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

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

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

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

PUBLIC AVAILABILITY OF COPIES OF PATENTS AND PATENT APPLICATIONS

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

NASA *patent application specifications* are sold in paper copy by the National Technical Information Service at price code A02 ($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)982-2351
KSC-xxxxx XKS-xxxxx	John F Kennedy Space Center Mail Code AA-PAT Kennedy Space Center, Florida 32899 Telephone (305)867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code 456 Langley Station Hampton, Virginia 23365 Telephone (804)827-3725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code 500-311 21000 Brookpark Road Cleveland, Ohio 44135 Telephone (216)433-6346
MSC-xxxxx XMS-xxxxx	Lyndon B Johnson Space Center Mail Code AM Houston, Texas 77058 Telephone (713)483-4871
MFS-xxxxx XMF-xxxxx	George C Marshall Space Flight Center Mail Code CC01 Huntsville, Alabama 35812 Telephone (205)453-0020
NPO-xxxxx XNP-xxxxx FRC-xxxxx XFR-xxxxx WOO-xxxxx	NASA Resident Legal Office Mail Code 180-601 4800 Oak Grove Drive Pasadena, California 91103 Telephone (213)354-2700

PATENT LICENSING REGULATIONS

Title 14—AERONAUTICS AND SPACE

Chapter V—National Aeronautics and Space Administration

PART 1245—PATENTS

Subpart 2—Patent Licensing Regulations

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

Sec
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 U S C 2457, 2473(b) (3).

§ 1245.200 Scope of subpart.

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

§ 1245.201 Definitions.

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

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

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

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

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

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

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

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

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

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

§ 1245.202 Basic considerations.

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

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

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

(d) All licenses for inventions shall be by express written instruments. No license shall be granted either expressly or by implication, for a NASA invention except as provided for in §§ 1245 203 and 1245 204 and in any existing or future treaty or agreement between the United States and any foreign government

(e) Licenses for inventions covered by NASA-owned foreign patents and patent applications shall be granted in accordance with the NASA Foreign Patent Licensing Regulations (§ 1245 4)

§ 1245.203 Licenses for practical application of inventions.

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

(b) *Nonexclusive licenses* (1) Each invention will be made available to responsible applicants for nonexclusive, revocable licensing in accordance with § 1245 206, consistent with the provisions of any existing exclusive license

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

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

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

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

(c) *Short-form nonexclusive licenses.* A nonexclusive, revocable license for a special invention, as defined in § 1245 201 (d), shall be granted upon written request, to any applicant by the Patent Counsel of the NASA installation having cognizance of the invention

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

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

(ii) Either a notice pursuant to

§ 1245 205 listing the invention as available for licensing has been published in the FEDERAL REGISTER for at least 9 months, or a patent covering the invention has been issued for at least 6 months However, a limited exclusive license may be granted prior to the periods specified above if the Administrator determines that the public interest will best be served by the earlier grant of an exclusive license.

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

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

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

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

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

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

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

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

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

§ 1245.204 Other licenses.

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

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

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

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

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

§ 1245.205 Publication of NASA inventions available for license.

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

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

§ 1245.206 Application for nonexclusive license.

(a) *Submission of application* An application for nonexclusive license under § 1245 203(b) or a short-form nonexclusive license for special inventions under § 1245 203(c) shall be addressed to the NASA Patent Counsel of the NASA installation having cognizance over the NASA invention for which a license is desired or to the NASA Assistant General Counsel for Patent Matters

(b) *Contents of an application for nonexclusive license* An application for nonexclusive license under § 1245 203(b) shall include.

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

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

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

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

(5) Number of employees,

(6) Purpose for which license is desired;

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

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

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

(c) *Contents of an application for a short-form nonexclusive license* An application for a short-form nonexclusive license under § 1245 203(c) for a special invention shall include

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

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

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

§ 1245.207 Application for exclusive license.

(a) *Submission of application* An application for exclusive license under § 1245 203(d) may be submitted to NASA at any time An application for exclusive license shall be addressed to the NASA Assistant General Counsel for Patent Matters.

(b) *Contents of an application for exclusive license* In addition to the requirements set forth in § 1245 206(b), the application for an exclusive license shall include:

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

(i) Small business firm;

(ii) Minority business enterprise;

(iii) Location in a surplus labor area;

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

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

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

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

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

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

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

§ 1245.208 Processing applications for license.

(a) *Initial review* Applications for nonexclusive and exclusive licenses under §§ 1245 206 and 1245 207 will be reviewed by the Patent Counsel of the NASA installation having cognizance for the invention and the NASA Assistant General Counsel for Patent Matters, to determine the conformity and appropriateness of the application for license and the availability of the specific invention for the license requested The Assistant General Counsel for Patent Matters will forward all applications for license conforming to §§ 1245 206(b) and 1245 207(b) to the NASA Inventions and Contributions Board when the invention is available for consideration of the requested license Prior to forwarding applications for exclusive licenses to the Inventions and Contributions Board, notice in writing will be given to each nonexclusive licensee for the specific invention advising of the receipt of the application for the exclusive license and providing each nonexclusive licensee with a 30-day period for submitting either evidence that practical application of the invention has occurred or is about to occur or, an application for an exclusive license for the invention.

(b) *Recommendations of Inventions and Contributions Board* The Inventions and Contributions Board shall, in accordance with the basic considerations set forth in §§ 1245.202 and 1245 203, evaluate all applications for license forwarded by the Assistant General Counsel for Patent Matters Based upon the facts presented to the Inventions and Contributions Board in the application and any other facts in its possession, the Inventions and Contributions Board shall recommend to the Administrator· (1) Whether a nonexclusive or exclusive license should be granted, (2) the identity of the licensee, and (3) any special terms or conditions of the license.

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

(d) *Determination of Administrator and grant of exclusive licenses*—(1) *Notice.* If the Administrator determines that the best interest of the United States will be served by the granting of an exclusive license in accordance with the basic considerations set forth in §§ 1245 202 and 1245 203, a notice shall be published in the FEDERAL REGISTER announcing the intent to grant the exclusive license, the identification of the invention, special terms or conditions of the proposed license, and a statement that NASA will grant the exclusive license unless within 30 days of the publication of such notice the Inventions and Contributions Board receives in writing any of the following together with supporting documentation

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

(ii) An application for a nonexclusive license under such invention, in accordance with § 1245 206(b), in which applicant states that he has already brought or is likely to bring the invention to practical application within a reasonable period

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

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

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

§ 1245.209 Royalties and fees.

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

(b) An exclusive license for an invention may require the payment of royalties, fees or other consideration when the licensing circumstances and the basic considerations in § 1245 202, considered together, indicate that it is in the public interest to do so

§ 1245.210 Reports.

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

§ 1245.211 Revocation of licenses.

(a) Any license granted pursuant to § 1245 203 may be revoked, either in part or in its entirety, by the Administrator if in his opinion the licensee at any time shall fail to use adequate efforts to bring to or achieve practical application of the invention in accordance with the terms of the license, or if the licensee at any time shall default in making any report required by the license, or shall make any false report, or shall commit any breach of any covenant or agreement therein contained, and shall fail to remedy any such default, false report, or breach within 30 days after written notice, or if the patent is deemed unenforceable either by the Attorney General or a final decision of a U S court

(b) Any license granted pursuant to § 1245 204(a) may be revoked, either in part or in its entirety, by the Administrator if in his opinion such revocation is necessary to achieve the earliest practical application of the invention pursuant to an application for exclusive license submitted in accordance with § 1245 207, or the licensee at any time shall breach any covenant or agreement contained in the license, and shall fail to remedy any such breach within 30 days after written notice thereof.

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

§ 1245.212 Appeals.

Any person desiring to file an appeal pursuant to § 1245 211(c) shall address the appeal to Chairman, Inventions and Contributions Board Any person filing an appeal shall be afforded an opportunity to be heard before the Inventions and Contributions Board, and to offer evidence in support of his appeal The procedures to be followed in any such matter shall be determined by the Administrator The Board shall make findings of fact and recommendations with respect to disposition of the appeal The decision on the appeal shall be made by the Administrator, and such decision shall be final and conclusive, except on questions of law, unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence

§ 1245.213 Litigation.

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

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

§ 1245.214 Address of communications.

(a) Communications to the Assistant General Counsel for Patent Matters in accordance with §§ 1245 206 and 1245 207 and requests for information concerning licenses for NASA inventions should be addressed to the Assistant General Counsel for Patent Matters, Code GP, National Aeronautics and Space Administration, Washington, D C 20546

(b) *Communications to the Inventions and Contributions Board* in accordance with §§ 1245 208, 1245 211, and 1245 212 should be addressed to Chairman, Inventions and Contributions Board, National Aeronautics and Space Administration, Washington, D C 20546

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

JAMES C FLETCHER,
Administrator.

FOREIGN PATENT LICENSING REGULATIONS

Selected NASA inventions are also available for licensing in countries other than the United States in accordance with the NASA Foreign Patent Licensing Regulation (14 C F R 1245 4), a copy of which is available from any NASA Patent Counsel For abstracts of NASA-owned inventions available for licensing in countries other than the United States, see NASA SP-7038, "Significant NASA Inventions Available for Licensing in Countries Other Than the United States" A copy of this NASA publication is available from NASA Headquarters, Code GP-4, Washington, D C, 20546

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AERONAUTICS

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

For related information see also *Astronautics*

ASTRONAUTICS

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

For related information see also *Aeronautics*

CHEMISTRY AND MATERIALS

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

ENGINEERING

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

GEOSCIENCES

Includes geosciences (general), earth resources, energy production and conversion, environment pollution, geophysics, meteorology and climatology, and oceanography
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45 ENVIRONMENT POLLUTION N.A.
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46 GEOPHYSICS 38
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 N.A
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) 38
Includes genetics

52 AEROSPACE MEDICINE 38
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 40
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 43
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61 COMPUTER PROGRAMMING AND SOFTWARE N.A.
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62 COMPUTER SYSTEMS N A.
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63 CYBERNETICS N.A.
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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*

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

Section 2 • Indexes

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NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

02 AERODYNAMICS

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

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

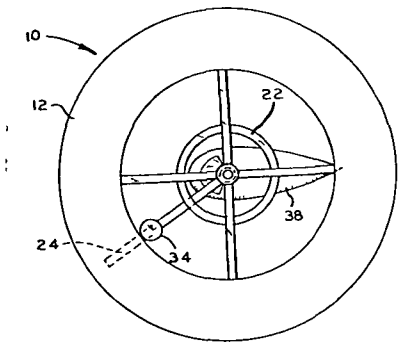
N78-19055*# National Aeronautics and Space Administration Hugh L Dryden Flight Research Center Edwards, Calif

AN ANNULAR WING Patent Application

Harold J Walker, inventor (to NASA) Filed 24 Feb 1978 21 p

(NASA-Case-FRC-11007-1, US-Patent-Appl-SN-880725) Avail NTIS HC A02/MF A01 CSCL 01A

An annular wing is described for the purpose of supporting an aircraft in flight without the use of directional stabilizer surfaces The wing comprises an annular body of substantially uniform symmetrical configuration characterized by an annular positive lifting surface and a chord line The wing is highly maneuverable, simple in concept, economic to fabricate and characterized by stable horizontal flight properties at subsonic speeds 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*

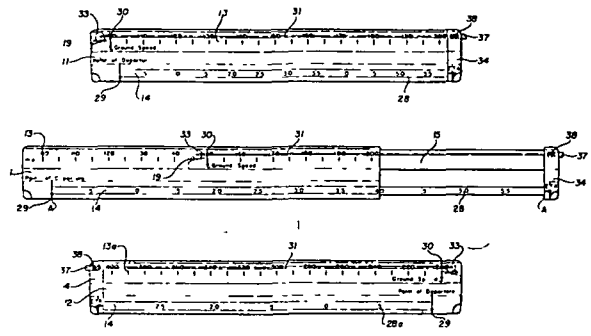
N78-17031* National Aeronautics and Space Administration Pasadena Office Calif

RULER FOR MAKING NAVIGATIONAL COMPUTATIONS Patent

Lawrence Holmes Jr inventor (to NASA) (TRW Inc Redondo Beach, Calif) Issued 18 Jan 1966 7 p Filed 18 Dec 1961 Sponsored by NASA

(NASA-Case-XNP-01458 US-Patent-3 229 905 US-Patent-Appl-SN-160093 US-Patent-Class-235-70) Avail US Patent Office CSCL 17G

An extensivle ruler used as a computer in navigation to calculate travel time between map points or to calculate ground speed is described The ruler has a time scale that can be adjusted at length to equal map distances travelled at a designated speed in a time period such as sixty minutes A means for fixing the length of the ruler is also provided B B



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*

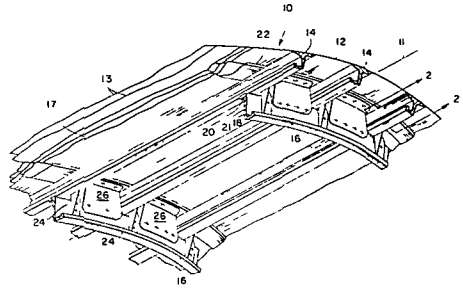
N78-18045*# National Aeronautics and Space Administration Langley Research Center, Langley Station, Va

FUSELAGE STRUCTURE USING ADVANCED TECHNOLOGY METAL MATRIX FIBER REINFORCED COMPOSITES Patent Application

Robert K Robinson (Boeing Commercial Airplane Co Seattle) and Harry M Tomlinson inventors (to NASA) (Boeing Commercial Airplane Co Seattle) Filed 16 Feb 1978 15 p Sponsored by NASA

(NASA-Case-LAR-11688-1 US-Patent-Appl-SN-878540) Avail NTIS HC A02/MF A01 CSCL 01C

A fuselage structure in which the skin is comprised of layers of a metal matrix fiber reinforced composite is described The plies of the composite material are built up so as to take advantage of the unidirectional properties of strength and stiffness of the composite material with alternate plies of material oriented at approximately 45 deg and approximately 315 deg to the fuselage longitudinal axis The stringers which run longitudinally and support the skin are also reinforced with layers of metal matrix fiber reinforced material oriented at approximately 0 deg relative to the fuselage longitudinal axis The metal matrix fiber reinforced composite used in the preferred embodiment is borsic aluminum Borsic aluminum is comprised of silicone coated boron fibers embedded in an aluminum matrix which results in a fuselage structure that is significantly lighter than a similar fuselage of titanium NASA



07 AIRCRAFT PROPULSION AND POWER

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

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

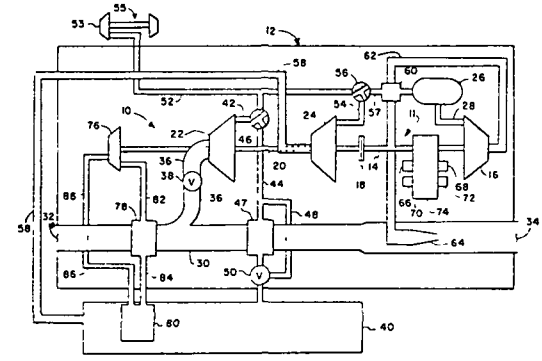
N78-10096*# National Aeronautics and Space Administration Langley Research Center, Langley Station Va

INDEPENDENT POWER GENERATOR Patent Application

Richard N Young inventor (to NASA) Filed 30 Jul 1976 16 p

(NASA-Case-LAR-11208-1, US-Patent-Appl-SN-710036) Avail NTIS HC A02/MF A01 CSCL 21E

A gas turbine powered aircraft auxiliary power system is described The system is capable of efficiently supplying all aircraft auxiliary services both in flight and on the ground It is capable also of operating independently of the aircraft main engines The system employs multiple gas turbine compressor stages and utilizes the aircraft cabin as a plenum chamber between the first and second compressor stages thereby accomplishing cabin pressurization ventilation and heating NASA



N78-17055* National Aeronautics and Space Administration Lewis Research Center Cleveland, Ohio

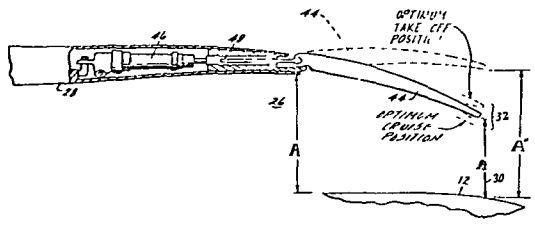
VARIABLE THRUST NOZZLE FOR QUIET TURBOFAN ENGINE AND METHOD OF OPERATING SAME Patent

Arthur P Adamson, inventor (to NASA) (GE Cincinnati Ohio) Issued 17 Jan 1978 7 p Filed 29 May 1975 Sponsored by NASA

(NASA-Case-LEW-12317-1 US-Patent-4,068 469, US-Patent-Appl-SN-581750 US-Patent-Class-60-204 US-Patent-Class-60-226R US-Patent-Class-60-271) Avail US Patent Office CSCL 21E

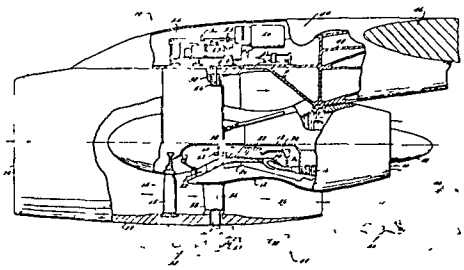
An improved method of operating a gas turbine engine is presented wherein engine-generated noise is maintained at a reduced level during reduced thrust operation Fan speed was maintained at a constant level while fan nozzle area was increased This maintained high inlet Mach numbers for reduced forward noise propagation and also permited reduced nozzle exhaust velocity for reduced shear noise In another embodiment airflow was increased by means of a fan blade pitch change or speed

increase while the fan nozzle area was increased, yielding both a net reduction in engine thrust and noise
Official Gazette of the U S Patent Office



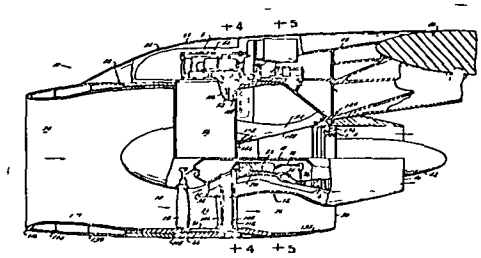
N78-17056* National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio
GAS TURBINE ENGINE WITH CONVERTIBLE ACCESSORIES Patent
Donald F Sargisson (GE Cincinnati, Ohio) and Arthur P Adamson, inventors (to NASA) Issued 17 Jan 1978 6 p Filed 8 Nov 1974 Sponsored by NASA
(NASA-Case-LEW-12390-1 US-Patent-4,068 470
US-Patent-Appl-SN-522109 US-Patent-Class-60-226R
US-Patent-Class-74-385 US-Patent-Class-74-417) Avail US Patent Office CSCL 21E

Drive means for connecting a gas turbine engine to its accessories are so constructed as to allow the accessories to be selectively positioned to any one of several predetermined circumferential positions about the perimeter of the engine This feature permits convenient mounting of the same engine upon vehicles demanding radically different engine mounting arrangements
Official Gazette of the U S Patent Office



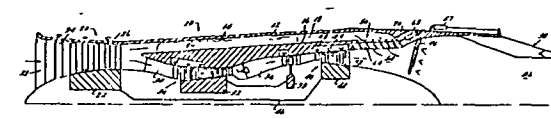
N78-18066* National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio
INTEGRATED GAS TURBINE ENGINE-NACELLE Patent
Arthur P Adamson, Donald F Sargisson, and Charles L Stotler, Jr inventors (to NASA) Issued 25 Oct 1977 9 p Filed 3 Nov 1975 Division of US Patent Appl SN-522108 filed 8 Nov 1974
(NASA-Case-LEW-12389-2, US-Patent-4,055 041,
US-Patent-Appl-SN-628221 US-Patent-Class-60-226R,
US-Patent-Class-60-39 31, US-Patent-Class-244-53A,
US-Patent-Class-244-54) Avail US Patent Office CSCL 21E

A nacelle for use with a gas turbine engine is presented An integral webbed structure resembling a spoked wheel for rigidly interconnecting the nacelle and engine provides lightweight support The inner surface of the nacelle defines the outer limits of the engine motive fluid flow annulus while the outer surface of the nacelle defines a streamlined envelope for the engine
Official Gazette of the U S Patent Office



N78-18067* National Aeronautics and Space Administration Lewis Research Center, Cleveland Ohio
VARIABLE MIXER PROPULSION CYCLE Patent
Dan Joseph Rundell (GE Cleveland), Donald Patrick McHugh (GE Cleveland), Tom Foster (GE Cleveland) and Ralph Harold Brown, inventors (to NASA) (GE Cleveland) Issued 24 Jan 1978 10 p Filed 2 Jun 1975 Sponsored by NASA
(NASA-Case-LEW-12917-1, US-Patent-4,069 661,
US-Patent-Appl-SN-583055 US-Patent-Class-60-204,
US-Patent-Class-60-262) Avail US Patent Office CSCL 21E

A design technique, method and apparatus are delineated for controlling the bypass gas stream pressure and varying the bypass ratio of a mixed flow gas turbine engine in order to achieve improved performance The disclosed embodiments each include a mixing device for combining the core and bypass gas streams The variable area mixing device permits the static pressures of the core and bypass streams to be balanced prior to mixing at widely varying bypass stream pressure levels The mixed flow gas turbine engine therefore operates efficiently over a wide range of bypass ratios and the dynamic pressure of the bypass stream is maintained at a level which will keep the engine inlet airflow matched to an optimum design level throughout a wide range of engine thrust settings
Official Gazette of the U S Patent Office

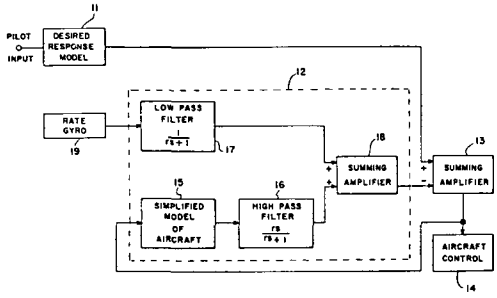


08 AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities piloting flight controls and autopilots

N78-17070*# National Aeronautics and Space Administration Langley Research Center Langley Station Va
FILTERING TECHNIQUE BASED ON HIGH-FREQUENCY PLANT MODELING FOR HIGH-GAIN CONTROL Patent Application
Frank R Niesson and John F Garren Jr inventors (to NASA) Filed 8 Dec 1977 14 p
(NASA-Case-LAR-12215-1 US-Patent-Appl-SN-858762) Avail NTIS HC A02/MF A01 CSCL 01C

An aircraft control system which utilized feedback motion sensors to generate a control signal to control the aircraft is illustrated The use of a complementary filter permitted a substantial increase in frequency bandwidth due to the simultaneous reduction in noise amplification and control limit cycle tendencies NASA



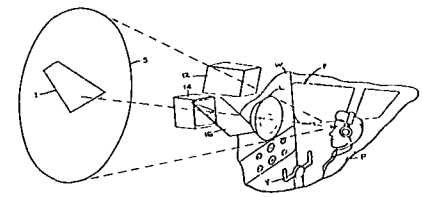
09 RESEARCH AND SUPPORT FACILITIES (AIR)

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)*

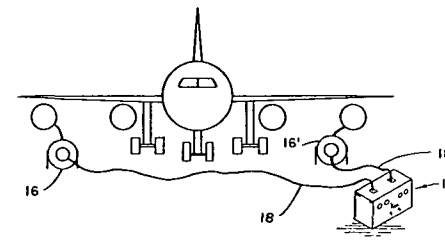
N78-18083* National Aeronautics and Space Administration Ames Research Center Moffett Field Calif
FULL COLOR HYBRID DISPLAY FOR AIRCRAFT SIMULATORS Patent
Wendell D Chase inventor (to NASA) Issued 25 Oct 1977 11 p Filed 17 Oct 1975 Supersedes N76-10148 (14 - 01 p 0021)
(NASA-Case-ARC-10903-1, US-Patent-4,055 004 US-Patent-Appl-SN-623536, US-Patent-Class-35-12N, US-Patent-Class-358-104) Avail US Patent Office CSCL 14B

A full spectrum color monitor connected to the camera and lens system of a television camera supported by a gantry frame over a terrain model simulating an aircraft landing zone, projects the monitor image onto a lens or screen visually accessible to a trainee in the simulator A digital computer produces a pattern corresponding to the lights associated with the landing strip onto a monochromatic display and an optical system projects the calligraphic image onto the same lens so that it is superposed on the video representation of the landing field The optical system includes a four-color wheel which is rotated between the calligraphic display and the lens, and an apparatus for synchronizing the generation of a calligraphic pattern with the color segments on the color wheel A servo feedback system responsive to the servo motors on the gantry frame produces an input to the computer so that the calligraphically generated signal corresponds in shape, size and location to the video signal *Official Gazette of the U S Patent Office*



N78-19166*# National Aeronautics and Space Administration Hugh L Dryden Flight Research Center Edwards Calif
A PORTABLE DEVICE PARTICULARLY SUITED FOR USE IN STARTING AIR-START UNITS FOR AIRCRAFT Patent Application
William R Rosier and George C Volk inventors (to NASA) Filed 9 Mar 1978 15 p
(Contract NAS4-2272)
(NASA-Case-FRC-10113-1 US-Patent-Appl-SN-885066) Avail NTIS HC A02/MF A01 CSCL 01E

The invention is embodied in a device including (1) a DC circuit having a pair of terminal plugs each plug being characterized by a first second and third terminal (2) a pair of manually operable switches for connecting the first terminal of each of the plugs to the positive side of a voltage source, (3) a circuit lead connecting the second terminal of each plug to the negative side of said source (4) a pair of electrical cables adapted to connect the first and second terminals of each plug to an air-start unit (5) means for connecting each of the cables between the first terminal of one plug and the third terminal of the other plug of the pair and (6) a second pair of manually operable switches for selectively connecting the third terminal of each plug of the pair to the negative side of the voltage source whereby electrical continuity of each cable of the pair may be examined prior to being connected to an air-start unit NASA

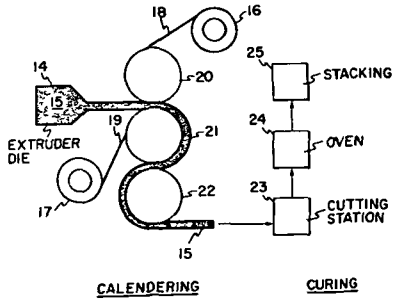


15 LAUNCH VEHICLES AND SPACE VEHICLES

Includes boosters manned orbital laboratories reusable vehicles and space stations

N78-13110*# National Aeronautics and Space Administration Ames Research Center Moffett Field Calif
FIRE PROTECTION COVERING FOR SMALL DIAMETER MISSILES Patent Application
Salvatore R Riccitiello and Paul M Sanko, inventors (to NASA) Filed 25 Nov 1977 19 p
(NASA-Case-ARC-11104-1 US-Patent-Appl-SN-854920) Avail NTIS HC A02/MF A01 CSCL 16D

Intumescent protection sheeting of unusually uniform thickness was prepared from epoxy polysulfide compositions containing microfibers and the ammonium salt of 1 4-nitroaniline-2-sulfonic acid An ammonium salt particle size in the order of 5 to 8 microns and a fiber size of about 1/128th inch in length and 3 to 5 microns in diameter was found critical to obtain the required density of 1 46 to 1 50 g/cc The insulation sheeting was prepared by a continuous process involving vacuum mixing calendering and curing under very strict conditions which depend to some extent upon the thickness of the sheet produced The resulting flexible sheet can be wrapped easily and tightly around small diameter missiles thus affording them for the first time protection from fire for at least 5 minutes The material is also suited for the protection of other articles with convoluted or contoured surfaces which require covering of highly uniform thickness NASA



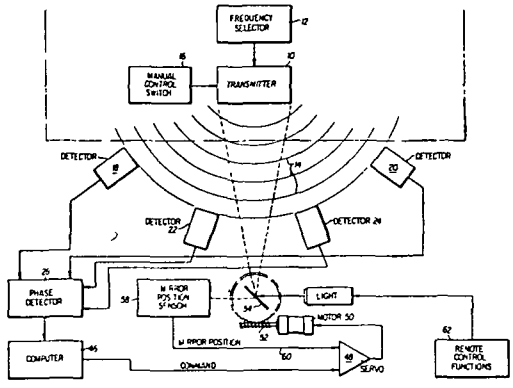
17 SPACECRAFT COMMUNICATIONS, COMMAND AND TRACKING

Includes telemetry space communications networks astronavigation and radio blackout

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

N78-17140* National Aeronautics and Space Administration Washington D C
SYSTEM AND METHOD FOR TRACKING A SIGNAL SOURCE Patent
Louis N Mogavero Edwin G Johnson John M Evans Jr and James S Albus inventors (to NASA) Issued 3 Jan 1978 7 p Filed 11 Jul 1975 Supersedes N75-30385 (13 - 21 p 2655)
(NASA-Case-HQN-10880-1 US-Patent-4 067 015 US-Patent-Appl-SN-595254 US-Patent-Class-343-225 US-Patent-Class-325-66 US-Patent-Class-325-118 US-Patent-Class-343-112R US-Patent-Class-362-269) Avail US Patent Office CSCL 17F

A system for tracking moving signal sources is disclosed which is particularly adaptable for use in tracking stage performers A miniature transmitter is attached to the person or object to be tracked and emits a detectable signal of a predetermined frequency A plurality of detectors positioned in a preset pattern sense the signal and supply output information to a phase detector which applies signals representing the angular orientation of the transmitter to a computer The computer provides command signals to a servo network which drives a device such as a motor driven mirror reflecting the beam of a spotlight to track the moving transmitter Official Gazette of the U S Patent Office

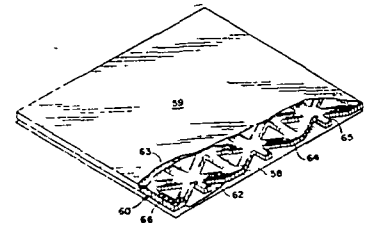


24 COMPOSITE MATERIALS

Includes laminates

N78-10214* National Aeronautics and Space Administration *Langley Research Center Langley Station Va*
COMPOSITE SANDWICH LATTICE STRUCTURE Patent
Marvin D Rhodes inventor (to NASA) and Martin M Mikulas Jr Issued 4 Oct 1977 13 p Filed 14 Sep 1976 Supersedes N77-15103 (15 - 06 p 0715)
(NASA-Case-LAR-11898-1, US-Patent-4,052 523 Appl-SN-723264 US-Patent-Class-428-116 US-Patent-Class-428-73 US-Patent-Class-428-138 US-Patent-Class-428-902) Avail US Patent Office CSCL 11D

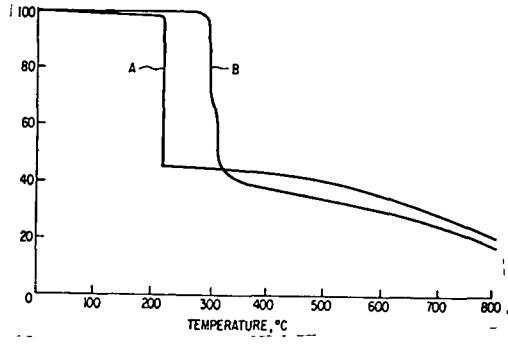
A lattice type structural panel is described The panel utilizes the unidirectional character of filamentary epoxy impregnated composites The panels are stiff lightweight structures for use in constructing space satellites and the like
Official Gazette of the U S Patent Office



N78-14096* National Aeronautics and Space Administration Ames Research Center Moffett Field Calif
INTUMESCENT COATINGS CONTAINING 4,4'-DINITROSULFANILIDE Patent
Paul M Sawko and Salvatore R Riccitiello inventors (to NASA) Issued 6 Dec 1977 10 p Filed 22 Oct 1976 Supersedes N77-11119 (15 - 02 p 0160)
(NASA-Case-ARC-11042-1 US-Patent-4 061 579
US-Patent-Appl-SN-734902 US-Patent-Class-252-8 1
US-Patent-Class-60-836) Avail US Patent Office CSCL 11D

A coating which is stable to the environment and to exposure to water and which intumesces at a favorable temperature was developed The composition comprises a mixture of 4 4 prime dinitrousulfanilide as the intumescent agent in a polymer binder mixture of a chlorinated polyolefin a bisphenol A epoxy resin and a rubber-like amine hardener

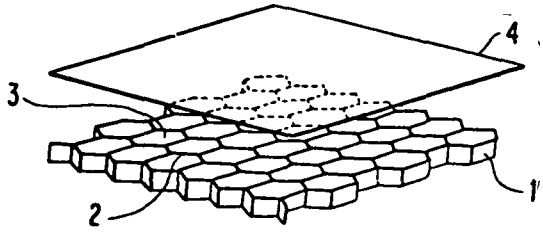
Official Gazette of the U S Patent Office



N78-15180* National Aeronautics and Space Administration Ames Research Center, Moffett Field Calif
HONEYCOMB-LAMINATE COMPOSITE STRUCTURE Patent
William J Gilwee Jr and John A Parker inventors (to NASA) Issued 6 Dec 1977 12 p Filed 22 Jun 1976 Supersedes N76-26286 (14 - 17 p 2166)
(NASA-Case-ARC-10913-1, US-Patent-4,061 812
US-Patent-Appl-SN-698646, US-Patent-Class-428-117
US-Patent-Class-106-15FP US-Patent-Class-260-2 5N
US-Patent-Class-260-2 5R, US-Patent-Class-428-290
US-Patent-Class-428-71 US-Patent-Class-428-920,
US-Patent-Class-428-73) Avail US Patent Office CSCL 11D

A honeycomb-laminate composite structure was comprised of (1) a cellular core of a polyquinoxaline foam in a honeycomb structure, and (2) a layer of a noncombustible fibrous material impregnated with a polyimide resin laminated on the cellular core A process for producing the honeycomb-laminate composite structure and articles containing the honeycomb-laminate composite structure is described

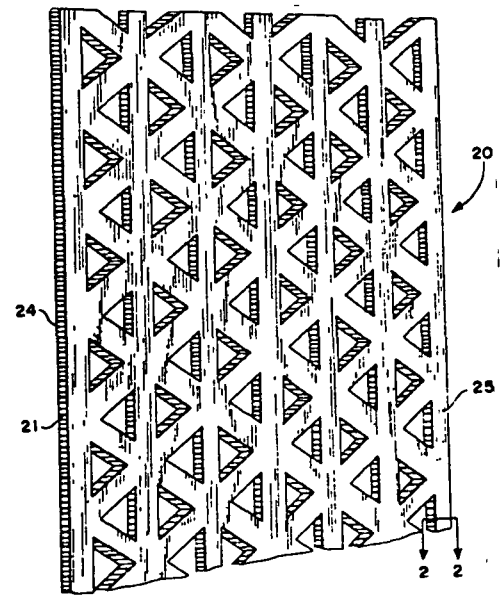
Official Gazette of the U S Patent Office



N78-17149* National Aeronautics and Space Administration Langley Research Center, Langley Station Va
METHOD OF MAKING A COMPOSITE SANDWICH LATTICE STRUCTURE Patent
Marvin D Rhodes and Martin M Mikulas, Jr , inventors (to NASA) Issued 20 Dec 1977 11 p Filed 20 May 1977 Supersedes N77-26242 (15 - 17, p 2233) Division of US Patent Appl SN-723264, filed 14 Sep 1976
(NASA-Case-LAR-11898-2 US-Patent-4 063 981
US-Patent-Appl-SN-799024 US-Patent-Class-156-245
US-Patent-Class-156-285 US-Patent-Class-156-289
US-Patent-Class-428-116 US-Patent-Class-428-902
US-Patent-Appl-SN-723264) Avail US Patent Office CSCL 11D

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

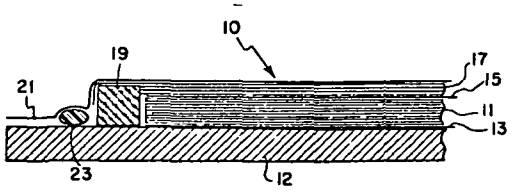
Official Gazette of the U S Patent Office



N78-17150* National Aeronautics and Space Administration Langley Research Center Langley Station Va
COMPOSITE LAMINATION METHOD Patent
George E Dickerson inventor (to NASA) Issued 27 Dec 1977 7 p Filed 28 Apr 1977 Supersedes N77-22179 (15 - 13, p 1689)
(NASA-Case-LAR-12019-1, US-Patent-4,065 340
US-Patent-Appl-SN-792067 US-Patent-Class-156-154
US-Patent-Class-156-264 US-Patent-Class-156-286
US-Patent-Class-156-289 US-Patent-Class-156-300
US-Patent-Class-156-306 US-Patent-Class-156-311
US-Patent-Class-264-90 US-Patent-Class-264-157
US-Patent-Class-428-294 US-Patent-Class-428-302
US-Patent-Class-156-285) Avail US Patent Office CSCL 11D

A process was developed for preparing relatively thick composite laminate structure wherein thin layers of prepreg tapes

are assembled these thin layers are cut into strips that are partially cured and stacked into the desired thickness with uncured prepreg disposed between each layer of strips The formed laminate is finally cured and thereafter machined to the desired final dimensions Official Gazette of the U S Patent Office



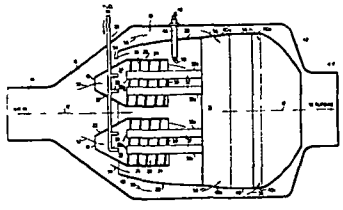
25 INORGANIC AND PHYSICAL CHEMISTRY

Includes chemical analysis e g chromatography combustion theory electrochemistry and photochemistry

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

N78-10224* *National Aeronautics and Space Administration* Lewis Research Center Cleveland Ohio
FUEL COMBUSTOR Patent
Cecil J Marek, inventor (to NASA) Issued 4 Oct 1977 5 p Filed 31 Mar 1976 Supersedes N76-20215 (14 - 11 p 1358)
(NASA-Case-LEW-12137-1 US-Patent-4,052 144
US-Patent-Appl-SN-672210 US-Patent-Class-431-352
US-Patent-Class-431-158 US-Patent-Class-60-39 51R
US-Patent-165-105) Avail US Patent Office CSCL 21B

A *fuel combustor comprises a chamber with air and fuel* inlets and a combination gas outlet The fuel is supplied to a vaporization zone and fuel and air are mixed in a pair of mixing chambers, each exemplified by a swirl can The resultant mixture is directed into a combustion zone within the combustor Heat pipes are arranged with one end portion substantially in the combustion zone and the other end in the vaporization zone of its appropriate mixing chamber Some of the heat of combustion is thus carried back upstream into the swirl cans to vaporize the fuel as it enters the vaporization zone in the swirl can, *thereby improving vaporization and fuel mixing*
Official Gazette of the U S Patent Office

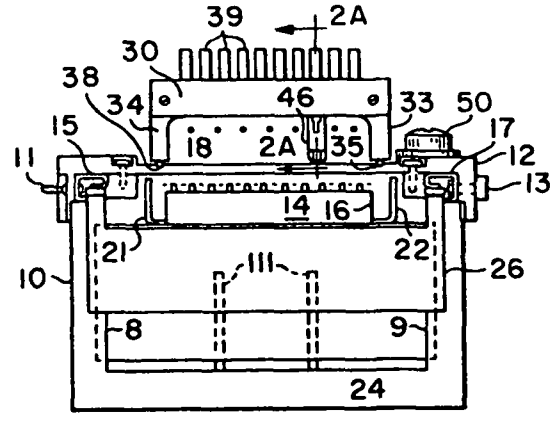


N78-10225* National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex
PROCESS OF FORMING CATALYTIC SURFACES FOR WET OXIDATION REACTIONS Patent
Robert Bruce Jagow inventor (to NASA) (LMSC *Sunnyvale,* Calif) Issued 4 Oct 1977 5 p Filed 10 May 1976 Supersedes N76-23387 (14 - 14 p 1777) Sponsored by NASA
(NASA-Case-MSC-14831-1 US-Patent-4 052 302,
US-Patent-Appl-SN-685027 US-Patent-Class-210-63R
US-Patent-Class-210-71 US-Patent-Class-204-292
US-Patent-Class-252-472 US-Patent-Class-427-229) Avail US Patent Office CSCL 07D

A wet oxidation process was developed for oxidizing waste materials comprising dissolved ruthenium salt in a reactant feed stream containing the waste materials The feed stream is introduced into a reactor and the reactor contents are then raised to an elevated temperature to effect deposition of a catalytic surface of ruthenium black on the interior walls of the reactor The feed stream is then maintained in the reactor for a period of time sufficient to effect at least partial oxidation of the waste materia s Official Gazette of the U S Patent Office

N78-11216*# National Aeronautics and Space Administration Ames Research Center Moffett Field Calif
IMPROVEMENTS IN MICROELECTROPHORETIC APPARATUS AND PROCESS Patent Application
Benjamin W Grunbaum inventor (to NASA) (Calif Univ Berkeley) Filed 10 Nov 1977 32 p Sponsored by NASA
(NASA-Case-ARC-11121-1 US-Patent-Appl-SN-850507) Avail NTIS HC A03/MF A01 CSCL 07D

Gel tray and lid assemblies designed for use in conjunction with slotted electrophoretic membranes were developed to take advantage of 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 which can develop the electrophoretic patterns of up to 30 individual protein samples in up to 10 tray or membrane compartments In addition to greatly simplifying and speeding up electrophoresis these methods and equipment can contribute to the standardization of processes for clinical forensic and anthropological diagnosis and identification NASA

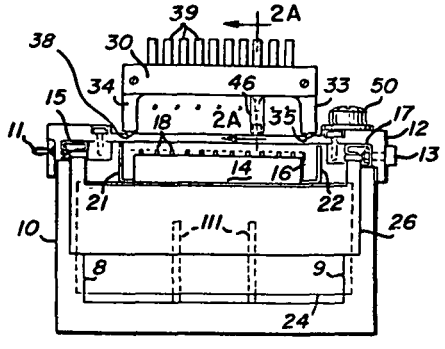


N78-14104* National Aeronautics and Space Administration Ames Research Center Moffett Field Calif

AUTOMATIC MULTIPLE-SAMPLE APPLICATOR AND ELECTROPHORESIS APPARATUS Patent

Benjamin W Grunbaum inventor (to NASA) (Calif Univ Berkeley) Issued 6 Dec 1977 7 p Filed 24 Nov 1976 Supersedes N77-12157 (15 - 03 p 0305) Sponsored by NASA (NASA-Case-ARC-10991-1 US-Patent-4 061 561 US-Patent-Appl-SN-744574 US-Patent-Class-204-299R US-Patent-Class-204-180G) Avail US Patent Office CSCL 07D

An apparatus for performing electrophoresis and a multiple-sample applicator is described Electrophoresis is a physical process in which electrically charged molecules and colloidal particles upon the application of a dc current migrate along a gel or a membrane that is wetted with an electrolyte A multiple-sample applicator is provided which coacts with a novel tank cover to permit an operator either to depress a single button thus causing multiple samples to be deposited on the gel or on the membrane simultaneously or to depress one or more sample applicators separately by means of a separate button for each applicator Official Gazette of the U S Patent Office



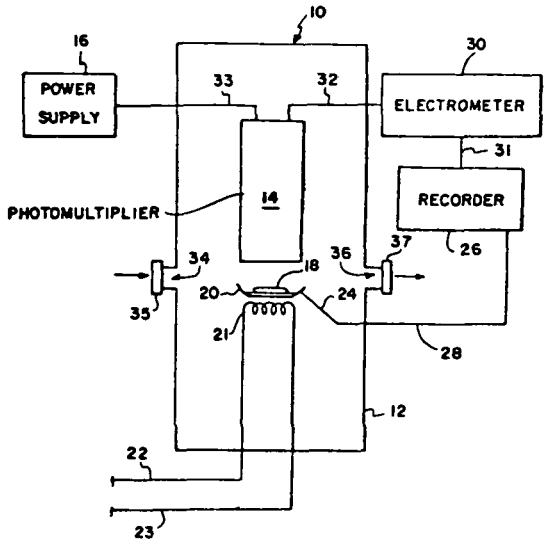
N78-15210* National Aeronautics and Space Administration Langley Research Center Langley Station, Va

THERMOLUMINESCENT AEROSOL ANALYSIS Patent

Robert S Rogowski and Edward R Long, Jr inventors (to NASA) Issued 13 Dec 1977 7 p Filed 29 Dec 1976 Supersedes N77-17609 (15 - 08 p 1058) (NASA-Case-LAR-12046-1 US-Patent-4,062 650, US-Patent-Appl-SN-755310 US-Patent-Class-23-232E US-Patent-Class-23-232R US-Patent-Class-23-230PC, US-Patent-Class-73-23) Avail US Patent Office CSCL 07D

A method for detecting and measuring trace amounts of aerosols when reacted with ozone in a gaseous environment was examined A sample aerosol was exposed to a fixed ozone concentration for a fixed period of time and a fluorescer was added to the exposed sample The sample was heated in a 30 C/minute linear temperature profile to 200 C The trace peak was measured and recorded as a function of the test aerosol and the recorded thermoluminescence trace peak of the fluorescer is specific to the aerosol being tested

Official Gazette of the U S Patent Office



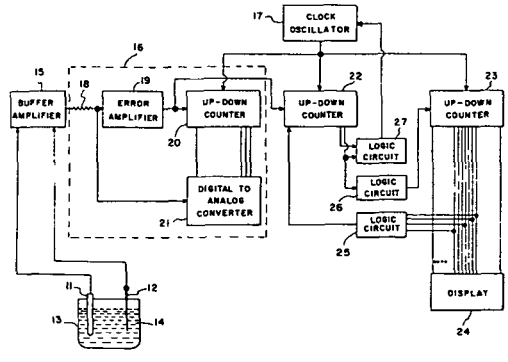
N78-17171*# National Aeronautics and Space Administration Langley Research Center Langley Station Va

ELECTROCHEMICAL DATA SIGNAL PROCESS AND DISPLAY Patent Application

Judd R Wilkins and Richard N Young inventors (to NASA) Filed 30 Nov 1977 11 p (NASA-Case-LAR-11922-1 US-Patent-Appl-SN-856460) Avail NTIS HC A02/MF A01 CSCL 07D

An electrochemical detection device for detecting microorganisms is described A standard ph reference electrode and a platinum cathodic electrode are positioned in a countainer with suitable nutrient medium for microbial growth plus the sample to be tested The two electrodes are connected to electronic circuitry including an up/down counter which counts up for the first 80 minutes after a test has been initiated Then the potential between the two electrodes is tracked by the electronic circuitry and after there is a change of 10 mv a signal is sent to the up/down counter to cause it to reverse its count Thereafter when there is an additional 20 mv change in the potential between the two electrodes another signal is sent to the up/down counter signalling it to stop The resulting count on the counter is equal to the length of time for the inoculum to begin the production of measurable amounts of H2 after inoculation This length of time is indicative of a endpoint

NASA



26 METALLIC MATERIALS

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

N78-18182* National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

TANTALUM MODIFIED FERRITIC IRON BASE ALLOYS Patent

Robert E Oldrieve and Charles P Blankenship, inventors (to NASA) Issued 25 Oct 1977 3 p Filed 21 Jan 1976 Supersedes N76-17233 (14 - 08, p 0958)
(NASA-Case-LEW-12095-1 US-Patent-4,055,416, US-Patent-Appl-SN-651009, US-Patent-Class-75-124 US-Patent-Class-75-126D, US-Patent-Class-75-126F US-Patent-Class-75-128G Us-Patent-Class-75-128T) Avail US Patent Office CSCL 11F

Strong ferritic alloys of the Fe-CR-Al type containing 0 4% to 2% tantalum were developed These alloys have improved fabricability without sacrificing high temperature strength and oxidation resistance in the 800 C (1475 F) to 1040 C (1900 F) range Official Gazette of the U S Patent Office

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N78-18183* National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

DIRECTIONALLY SOLIDIFIED EUTECTIC GAMMA-GAMMA NICKEL-BASE SUPERALLOYS Patent

Melvin R Jackson, inventor (to NASA) Issued 25 Oct 1977 7 p Filed 7 May 1976
(NASA-Case-LEW-12905-1, US-Patent-4 055,447 US-Patent-Appl-SN-684171 US-Patent-Class-148-32, US-Patent-Class-75-170, US-Patent-Class-148-32 5) Avail US Patent Office CSCL 11F

A directionally solidified multivariant eutectic gamma-gamma prime nickel-base superalloy casting having improved high temperature properties was developed The alloy is comprised of a two phase eutectic structure consisting essentially of on a weight percent basis 6 0 - 9 0 *aluminum*, 5 0 - 17 0 *tantalum* 0-10 cobalt, 0-6 vanadium, 0-6 rhenium, 2 0-6 0 tungsten, and the balance being nickel subject to the proviso that the sum of the atomic percentages of aluminum plus tantalum is within the range of from 19-22, and the ratio of atomic percentages of tantalum to aluminum plus tantalum is within the range of from 0 12 - 0 23 Embedded within the gamma nickel-base matrix are aligned eutectic gamma prime phase (primarily nickel-aluminum-tantalum) reinforcing fibers
Official Gazette of the U S Patent Office

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27 NONMETALLIC MATERIALS

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

N78-10292*# National Aeronautics and Space Administration Ames Research Center, Moffett Field Calif

PREPARATION OF HETEROCYCLIC BLOCK COPOLYMER FROM PERFLUOROALKYLENE OXIDE ALPHA, OMEGA-DIAMIDOXIMES Patent Application

Robert W Rosser Leonard O Ross (Stanford Research Inst Menlo Park Calif) and Mark Iannone, inventors (to NASA) Filed 17 Oct 1977 21 p
(NASA-Case-ARC-11060-1 US-Patent-Appl-SN-843090) Avail NTIS HC A02/MF A01 CSCL 07C

New heat and chemical resistant polymeric materials are prepared by the thermal condensation of diamidoxime monomers to yield larger molecules having 1, 2 4-oxadiazole linkages This process of direct intermolecular condensation of amidoxime groups is used for the synthesis of new fluorinated 1, 3, 4 -oxadiazole polymers NASA

N78-11245*# National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt Md

ELECTRICALLY CONDUCTIVE THERMAL CONTROL COATINGS *Patent Application*

Michael Charles Shai inventor (to NASA) Filed 21 Oct 1977 16 p
(NASA-Case-GSC-12207-1 US-Patent-Appl-SN-844344) Avail NTIS HC A02/MF A01 CSCL 11G

A coating characterized by low thermal absorption high thermal emittance and high electrical conductivity was developed The paint composition or coating comprises a fired oxide pigment having a minor amount of aluminum oxide and a major amount of zinc oxide an alkali metal silicate vehicle-binder and sufficient water to provide a mixture suitable for application to a substrate 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 NASA

N78-14164* National Aeronautics and Space Administration Pasadena Office Calif

DURABLE ANTISTATIC COATING FOR POLY-METHYLMETHACRYLATE Patent

Vaclav Hadek (JPL) Robert B Somoano (JPL), and Alan Rembaum, inventors (to NASA) (JPL) Issued 6 Dec 1977 4 p *Filed 3 Jun 1976 Supersedes* N77-22257 (15 - 13 p 1699) Sponsored by NASA
(NASA-Case-NPO-13867-1 US-Patent-4 061 834 US-Patent-Appl-SN-692284 US-Patent-Class-428-522 US-Patent-Class-428-922 US-Patent-Class-428-411 US-Patent-Class-96-87A US-Patent-Class-260-DIG 15 US-Patent-Class-427-164) Avail US Patent Office CSCL 11G

A durable antistatic coating is achieved on polymethylmethacrylate plastic without affecting its optical clarity by applying to the surface of the plastic a low molecular weight solvent having a high electron affinity and a high dipole moment, such as acentonitrile or nitromethane alone or in the presence of photopolymerizable monomer The treated polymethylmethacrylate plastic dissipates most of the induced electrostatic charge and retains its optical clarity The antistatic behavior persists after washing rubbing and vacuum treatment
Official Gazette of the U S Patent Office

N78-15276* National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

TRIMERIZATION OF AROMATIC NITRILES Patent

Li-Chen Hsu inventor (to NASA) Issued 6 Dec 1977 18 p Filed 10 Oct 1974 Supersedes N74-34579 (12 - 24 p 2914)
(NASA-Case-LEW-12053-1 US-Patent-4 061 856 US-Patent-Appl-SN 513613 US-Patent-Class-544-193 US-Patent-Class-260-2R US-Patent-Class-526-193 US-Patent-Class-526-225) Avail US Patent Office CSCL 07C

Triazine compounds and cross-linked polymer compositions were made by heating aromatic nitriles to a temperature in the range of about 100 C to about 700 C in the presence of a catalyst or mixture of catalysts Aromatic nitrile-modified (terminated and/or appended) imide benzimidazole imidazopyrrolone quinoxaline and other condensation type prepolymers or *their precopolymers were made which were trimerized with or* without a filler by the aforementioned catalytic trimerization process Official Gazette of the U S Patent Office

N78-17205* National Aeronautics and Space Administration Langley Research Center Langley Station Va
POLYIMIDE ADHESIVES Patent
Donald J Progar, Vernon L Bell, and Terry L StClair, inventors (to NASA) Issued 27 Dec 1977 5 p Filed 22 Oct 1976 Supersedes N77-15192 (15 - 06, p 0729) Continuation-in-part of abandoned US Patent Appl SN 532784 filed 16 Dec 1974 (NASA-Case-LAR-12181-1 US-Patent-4 065 345 US-Patent-Appl-SN-734901, US-Patent-Class-156-309, US-Patent-Class-156-331 US-Patent-Class-260-30 4N, US-Patent-Class-260-32 2R, US-Patent-Class-260-32 6NT US-Patent-Class-260-33 4R, US Patent-Appl-SN-532784) Avail US Patent Office CSCL 11A

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

N78-17206* National Aeronautics and Space Administration Langley Research Center Langley Station, Va
THERMAL SHOCK AND EROSION RESISTANT TANTALUM CARBIDE CERAMIC MATERIAL Patent
Leroy Honeycutt III (N C State Univ Raleigh) and Charles R Manning, inventors (to NASA) (N C State Univ , Raleigh) Issued 10 Jan 1978 4 p Filed 1 Apr 1976 Supersedes N76-23436 (14 - 14, p 1783) Sponsored by NASA
(NASA-Case-LAR-11902-1, US-Patent-4,067 742 US-Patent-Appl-SN-672695, US-Patent-Class-106-43 US-Patent-Class-60-200A, US-Patent-Class-75-229 US-Patent-Class-75-239 US-Patent-Class-75-241) Avail US Patent Office CSCL 11B

Ceramic tantalum carbide artifacts with high thermal shock and mechanical erosion resistance are provided by incorporating tungsten-rhenium and carbon particles in a tantalum carbide matrix The mix is sintered by hot pressing to form the ceramic article which has a high fracture strength relative to its elastic modulus and thus has an improved thermal shock and mechanical erosion resistance The tantalum carbide is preferable less than minus 100 mesh the carbon particles are preferable less than minus 100 mesh, and the tungsten-rhenium particles are preferable elongate, having a length to thickness ratio of at least 2/1 Tungsten-rhenium wire pieces are suitable as well as graphite particles Official Gazette of U S Patent Office

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N78-17213* National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston, Tex
FLAME RETARDANT SPANDEX TYPE POLYURETHANES Patent
John T Howarth (Little Arthur D Cambridge Mass) Suresh Sheth (Little, Arthur D Cambridge Mass) Kenneth R Sidman (Little, Arthur D , Cambridge, Mass) and Arthur A Massucco inventors (to NASA) (Little Arthur D Cambridge Mass) Issued 17 Jan 1978 10 p Filed 13 Feb 1976 Supersedes N76-24408 (14 - 15 p 1912) Division of US Patent Appl SN-374421 Filed 28 Jun 1973 US-Patent-3,956 233 Sponsored by NASA (NASA-Case-MSC-14331-2 US-Patent-4 069 212 US-Patent-Appl-SN-657907 US-Patent-Class-260-77 55P US-Patent-Class-260-75NH US-Patent-Class-260-75NK US-Patent-Class-260-75NT, US-Patent-Class-260-77 5AM US-Patent-Class-260-77 5AN US-Patent-Class-260-77 5AP US-Patent-Class-260-77 5AT US-Patent-3 956 233 US-Patent-Appl-SN-374421) Avail US Patent Office CSCL 11E

Flame retardant elastomeric compositions were developed comprised of (1) spandex type polyurethane having incorporated into the polymer chain halogen containing polyols (2) conventional spandex type polyurethanes in physical admixture flame retardant additives and (3) fluoroelastomeric resins in physical admixture with flame retardant additives Methods of preparing fibers of the flame retardant elastomeric materials are presented and articles of manufacture comprised of the elastomeric materials are mentioned Official Gazette of the U S Patent Office

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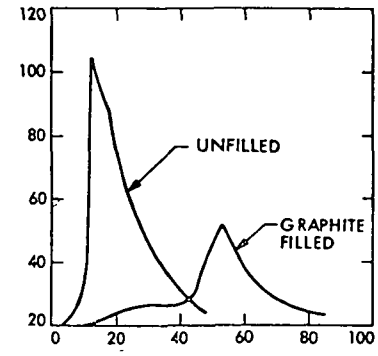
N78-17214* National Aeronautics and Space Administration Pasadena Office Calif
NUCLEAR ALKYLATED PYRIDINE ALDEHYDE POLYMERS AND CONDUCTIVE COMPOSITIONS THEREOF Patent
Alan Rembaum (JPL) and Stanley Singer inventors (to NASA) Issued 3 Nov 1970 3 p Filed 11 Sep 1968 Sponsored by NASA
(NASA-Case-NPO-10557 US-Patent-3,538 053 US-Patent-Appl-SN-759220, US-Patent-Class-260-67) Avail US Patent Office CSCL 07C

A thermally stable relatively conductive polymer was disclosed The polymer was synthesized by condensing in the presence of catalyst a 2, 4, or 6 nuclear alklylated 2, 3, or 4 pyridine aldehyde or quaternary derivatives thereof to form a polymer The pyridine groups were liked by olefinic groups between 2-4 2-6, 2-3, 3-4 3-6 or 4-6 positions Conductive compositions were prepared by dissolving the quaternary polymer and an organic charge transfer complexing agent such as TCNQ in a mutual solvent such as methanol
Official Gazette of the U S Patent Office

N78-17215* National Aeronautics and Space Administration Pasadena Office Calif
METHOD OF ADHERING BONE TO A RIGID SUBSTRATE USING A GRAPHITE FIBER REINFORCED BONE CEMENT Patent
Albert C Knoell (JPL) and Hugh G Maxwell inventors (to NASA) (JPL) Issued 27 Dec 1977 5 p Filed 6 Apr 1976 Supersedes N76-26281 (14 - 17, p 2166) Sponsored by NASA
(NASA-Case-NPO-13764-1 US-Patent-4,064 566, US-Patent-Appl-SN-674194 US-Patent-Class-3-1 9, US-Patent-Class-128-92C, US-Patent-Class-128-92G US-Patent-Class-260-42 17) Avail US Patent Office CSCL 11A

A method is described for adhering bone to the surface of a rigid substrate such as a metal or resin prosthesis using an improved surgical bone cement The bone cement has mechanical properties more nearly matched to those of animal bone and thermal curing characteristics which result in less traumatization of body tissues and comprises a dispersion of short high modulus graphite fibers within a bonder composition including polymer dissolved in reactive monomer such as polymethylmethacrylate dissolved in methylmethacrylate monomer
Official Gazette of the U S Patent Office



N78-17217*# *National Aeronautics and Space Administration* Goddard Space Flight Center Greenbelt, Md
ALKALI-METAL SILICATE BINDERS AND METHODS OF MANUFACTURE Patent Application
John B Schutt inventor (to NASA) Filed 21 Dec 1977 15 p
(NASA-Case-GSC-12303-1 US-Patent-Appl-SN-862880) Avail NTIS HC A02/MF A01 CSCL 11A

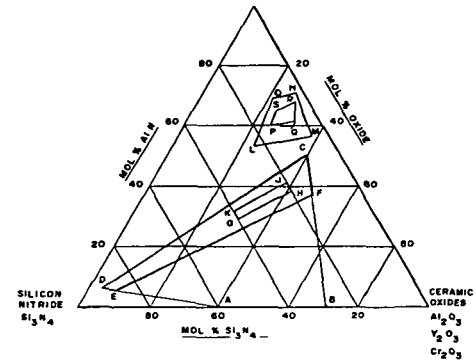
Binders were made from alkali metal silicates exhibiting a high silicon dioxide mol ratio which is important in establishing a characteristic of high resistance to water solubility The binders are stable during manufacture and storage and may be made with inexpensive components The process of making these binders is predictable and repeatable The process involves mixing a starter alkali metal metal silicate solution with silicon dioxide hydrogel and then with water and silicone The final product binder contains silicon dioxide and an alkali metal oxide, water and silicone The silicone dioxide is in the form of a hydrogel sol The hydrogel sol allows for the high mol ratio (for insolubility) and a high inorganic solids content for low porosity NASA

N78-17218*# National Aeronautics and Space Administration Langley Research Center Langley Station Va
MIXED DIAMINES FOR LOWER MELTING ADDITION POLYIMIDE PREPARATION AND UTILIZATION Patent Application
Terry L StClair inventor (to NASA) Filed 6 Oct 1977 13 p (NASA-Case-LAR-12054-1 US-Patent-Appl-SN-839963) Avail NTIS HC A02/MF A01 CSCL 07C

By employing a mixture of methylene dianilines as the diamine portion of the oligomer in an addition polymerization process, an oligomer is produced that is tacky and nonboardy when used to form a prepreg This mixed diamine oligomer melts in the 175-200 C temperature range during processing and requires only approximately 200 psi molding pressure to fabricate composite structures having equal or better physical property characteristics than those produced previously at 1000 psi molding pressure Composites prepared from oligomers of this type can be thermoformed at elevated temperatures after an initial molding in the 175-200 C temperature range due to this lowered melting temperature of the mixed diamines NASA

N78-19302* National Aeronautics and Space Administration Pasadena Office, Calif
HIGH TEMPERATURE RESISTANT CERMET AND CERAMIC COMPOSITIONS Patent
Wayne M Phillips, inventor (to NASA) (JPL) Issued 7 Feb 1978 10 p Filed 20 Nov 1975 Supersedes N76-13294 (14 - 04, p 0433) Sponsored by NASA
(NASA-Case-NPO-13690-1, US-Patent-4,072,532, US-Patent-Appl-SN-633876, US-Patent-Class-106-65, US-Patent-Class-106-39 5, US-Patent-Class-106-73 5) Avail US Patent Office CSCL 11B

High temperature oxidation resistance high hardness and high abrasion and wear resistance are properties of cermet compositions particularly to provide high temperature resistant refractory coatings on metal substrates, for use as electrical *insulation seals for thermionic converters* The compositions comprise 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 Ceramic compositions comprising a sintered solid solution of aluminum oxide, silicon nitride and aluminum nitride are also described
Official Gazette of the U S Patent Office



28 PROPELLANTS AND FUELS

Includes rocket propellants igniters and oxidizers storage and handling and aircraft fuels

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

N78-17230*# National Aeronautics and Space Administration Pasadena Office Calif
HIGH PERFORMANCE AMMONIUM NITRATE PROPELLANT Patent Application
Floyd A Anderson, inventor (to NASA) (JPL) Filed 16 Dec 1977 26 p
(Contract NAS7-100)
(NASA-Case-NPO-14260, US-Patent-Appl-SN-861390) Avail NTIS HC A03/MF A01 CSCL 21I

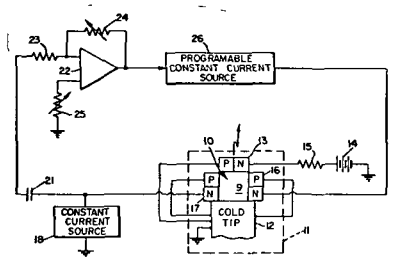
Propellants having the combustion efficiency and high burning rates normally only achieved with perchlorates, have now been formulated with ammonium nitrate as the primary oxidizer and with powdered metal fuel, all of which permits the use of lesser amounts of perchlorate oxidizer These novel formulations greatly reduce the total hydrogen chloride emissions to the atmosphere and hence are particularly desirable for the Space Shuttle propulsion systems NASA

31 ENGINEERING (GENERAL)

Includes vacuum technology control engineering display engineering and cryogenics

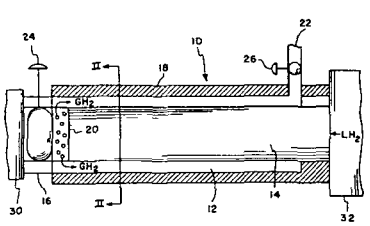
N78-10326*# National Aeronautics and Space Administration Goddard Inst for Space Studies, New York
THERMAL COMPENSATOR FOR CLOSED-CYCLE HELIUM REFRIGERATOR Patent Application
Donald E Jennings (NAS-NRC) and John J Hillman inventors (to NASA) Filed 30 Sep 1977 17 p
(NASA-Case-GSC-12168-1, US-Patent-Appl-SN-838337) Avail NTIS HC A02/MF A01 CSCL 13A

The wave length of an infrared, semiconductor laser diode 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 so that the sensing diode and 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 NASA



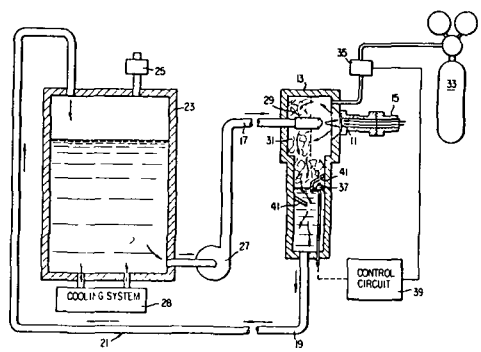
N78-11260*# National Aeronautics and Space Administration Langley Research Center Langley Station Va
LIQUID HYDROGEN FLASH VAPORIZER Patent Application
Albert M Momenthy inventor (to NASA) (Boeing Commercial Airplane Co Seattle) Filed 21 Oct 1977 9 p Sponsored by NASA
(NASA-Case-LAR-12159-1 US-Patent-Appl-SN-844347) Avail NTIS HC A02/MF A01 CSCL 13I

A method and device are disclosed for initially reducing the temperature of a stream of LH2 in a fuel distribution line The device allows some LH2 to escape into and vaporize in a shroud surrounding a length of the line just upstream of the nozzle The effect of this controlled evaporation is to cool the LH2 in the line to satisfactorily low temperatures before it exits the line This prevents the immediate vaporization of the fuel as it leaves the line NASA



N78-17237* 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 17 Jan 1978 4 p Filed 31 Mar 1976 Supersedes n76-20486 (14 - 11 p 1394)
(NASA-Case-LEW-11981-1, US-Patent-4 068 495, US-Patent-Appl-SN-672220 US-Patent-Class-62-376 US-Patent-Class-62-514R, US-Patent-Class-313-22) Avail US Patent Office CSCL 13G

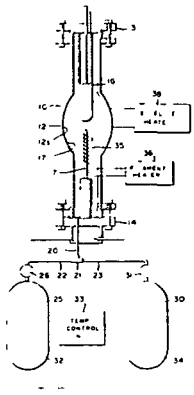
A closed loop apparatus for spraying coolant against the back of a radiation target is described The coolant was circulated through a closed loop with a bubble of inert gas being maintained around the spray Mesh material was disposed between the bubble and the surface of the liquid coolant which was below the bubble at a predetermined level In a second embodiment no inert gas was used the bubble consisting of a vapor produced when the coolant was sprayed against the target
Official Gazette of the U S Patent Office



N78-17238* National Aeronautics and Space Administration Pasadena Office, Calif
PURGING MEANS AND METHOD FOR XENON ARC LAMPS Patent
Charles G Miller inventor (to NASA) (JPL) Issued 30 Oct 1973 7 p Filed 19 Jun 1972 Sponsored by NASA
(NASA-Case-NPO-11978, US-Patent-3,769 544 US-Patent-Appl-SN-264268, US-Patent-Class-313-175 US-Patent-Class-313-176 US-Patent-Class-313-180, US-Patent-Class-313-184 US-Patent-Class-313-224) Avail US Patent Office CSCL 13H

High pressure Xenon short-arc lamp with two reservoirs which are selectively connectable to the lamp s envelope is described One reservoir contains an absorbent which will absorb both Xenon and contaminant gases such as CO2 and O2 The absorbent temperature is controlled to evacuate the envelope of both the Xenon and the contaminant gases The temperature of the absorbent is then raised to desorb only clean Xenon while retaining the contaminant gases thereby clearing the envelope of the contaminant gases The second reservoir contains a gas whose specific purpose is, to remove the objectional metal film which deposits gradually on the interior surface of the lamp envelope during normal arc operation The origin of the film is metal transferred from the cathode of the arc lamp by sputtering or

other gas transfer processes
Official Gazette of the U S Patent Office

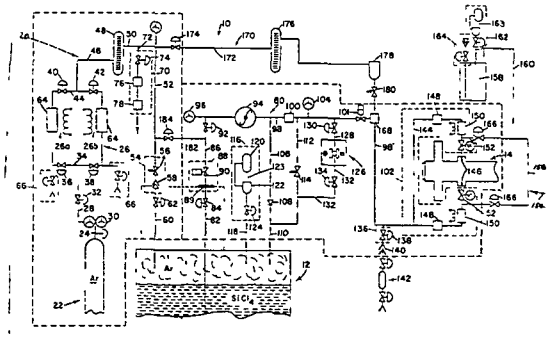


N78-18253*# National Aeronautics and Space Administration Pasadena Office, Calif

A SYSTEM FOR DELIVERING SiCl4 TO A CHEMICAL REACTOR Patent Application

Robert E Witkowski (Westinghouse Electric, Trafford, Pa) and Thomas S Bulischeck, inventors (to NASA) (Westinghouse Electric Trafford, Pa) Filed 31 Jan 1978 19 p
(Contracts NAS7-100 JPL-954589)
(NASA-Case-NPO-14383-1 US-Patent-Appl-SN-873993) Avail NTIS HC A02/MF A01 CSCL 13H

A system was developed for delivering SiCl4 to the chemical reactor employed in the production of solar grade silicon The system is characterized by a supply circuit including a tank comprising a source of high purity SiCl4 and a pressurized delivery loop connected between the source and a reactor for delivering SiCl4 under pressure to the reactor A gas cover circuit is connected to the supply circuit for introducing an inert dry cover gas into the source of SiCl4 for maintaining purity A quality control system including an analyzer connected with the supply circuit is used for detecting the presence of by-products of hydrolysis within the supply circuit and an analyzer connected with the cover gas circuit is provided for detecting the presence of moisture in the cover gas Additionally a further monitoring system is provided for purposes of extracting quantities of SiCl4 to be examined for metallic chlorides, oxides and the like NASA



32 COMMUNICATIONS

Includes land and global communications communications theory and optical communications

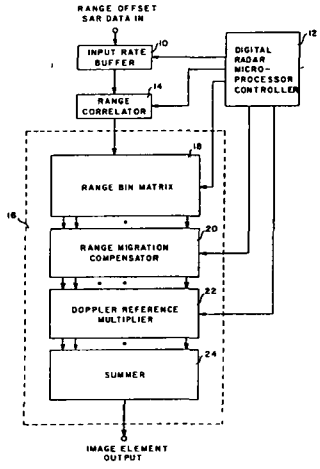
For related information see also *04 Aircraft Communications and Navigation* and *17 Spacecraft Communications, Command and Tracking*

N78-11266*# National Aeronautics and Space Administration Pasadena Office Calif

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

Wayne E Arens inventor (to NASA) (JPL) Filed 18 Oct 1977 23 p
(Contract NAS7-100)
(NASA-Case-NPO-14019-1 US-Patent-Appl-SN-843308) Avail NTIS HC A02/MF A01 CSCL 17I

An azimuth correlator architecture is defined 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 NASA



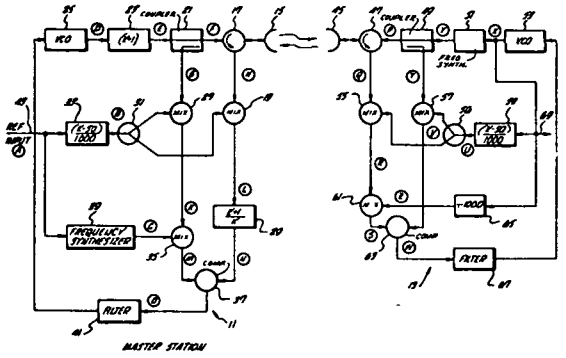
N78-15323* National Aeronautics and Space Administration Pasadena Office Calif

ULTRA STABLE FREQUENCY DISTRIBUTION SYSTEM Patent

Richard L Sydnor (JPL) and John W MacConnell, inventors (to NASA) (JPL) Issued 6 Dec 1977 9 p Filed 21 Jun 1976 Supersedes N76-31373 (14 - 22 p 2851) Sponsored by NASA
(NASA-Case-NPO-13836-1 US-Patent-4,061 974
US-Patent-Appl-SN-699002 US-Patent-Class-325-58, US-Patent-Class-178-69 1, US-Patent-Class-325-63, US-Patent-Class-343-179) Avail US Patent Office CSCL 17B

A system is presented for synchronizing a signal at a remotely located slave station with the phase and frequency of a signal generated at a master station The signal transmitted

at the master station and received by the slave station provides compensation for the phase shift caused by the transmission path delays between the master and slave station The slave station transmits a signal to the master station at a frequency that is different from the frequency of the signal being transmitted by the master station The signal transmitted by the slave station, is received by the master station while the master station transmitter is off The signal transmitted by the master station is received by the slave station while the slave station transmitter is off Official Gazette of the U S Patent Office



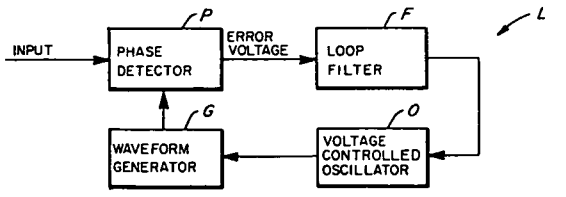
N78-15331*# National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston, Tex

APPARATUS AND METHOD FOR STABILIZED PHASE DETECTION FOR BINARY SIGNAL TRACKING LOOPS Patent Application

Phillip M Hopkins inventor (to NASA) (Lockheed Electronics Co Houston Tex) Filed 8 Dec 1977 24 p Sponsored by NASA

(NASA-Case-MSC-16461-1 US-Patent-Appl-SN-858765) Avail NTIS HC A02/MF A01 CSCL 17B

An apparatus and method for phase detection in binary signal tracking loops is described 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 NASA



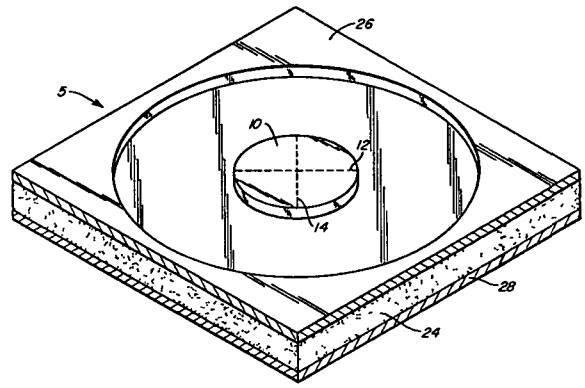
N78-15332*# National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex

LOW PROFILE CIRCULARLY POLARIZED ANTENNA Patent Application

I-Ping Yu, inventor (to NASA) (Lockheed Electronics Co, Houston, Tex) Filed 8 Dec 1977 17 p

(NASA-Case-MSC-16683-1 US-Patent-Appl-SN-858770) Avail NTIS HC A02/MF A01 CSCL 17B

A low profile antenna assembly for communicating electromagnetic radiation is described In a particular embodiment shown, a microstrip assembly is formed with an antenna element provided in the shape of an elliptical lamina The location of the feed point of the antenna element relative to a semimajor axis determines the polarization of radiation able to be transmitted or received by the antenna assembly as well as the antenna input impedance The polarization is generally elliptical, with right or left circularly polarized radiation communicable by placement of the feed point along a radial line oriented at a 45 deg azimuthal angle relative to a semimajor axis NASA



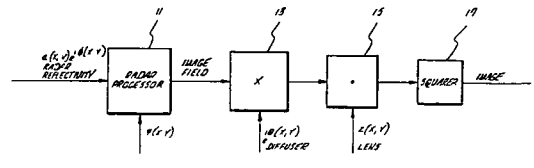
N78-18266*# National Aeronautics and Space Administration Pasadena Office Calif

CLUTTER FREE SYNTHETIC APERTURE RADAR CORRELATOR Patent Application

Atul Jain inventor (to NASA) (JPL) Filed 8 Dec 1977 8 p (Contract NAS7-100)

(NASA-Case-NPO-14035-1 US-Patent-Appl-SN-858767) Avail NTIS HC A02/MF A01 CSCL 17I

A synthetic aperture radar correlation system including a moving diffuser located at the image plane of a radar processor is presented The output of the moving diffuser is supplied to a lens whose impulse response is at least as wide as that of the overall processing system A significant reduction in clutter results The novelty of the invention appears to reside in locating a moving diffuser at the imaging plane of the radar processor and reimaging the diffuser with a lens whose impulse response is at least as wide as the impulse response of the radar system NASA



33 ELECTRONICS AND ELECTRICAL ENGINEERING

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

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

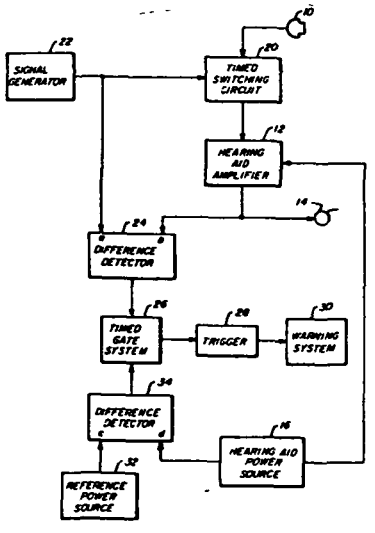
N78-10375* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex

HEARING AID MALFUNCTION DETECTION SYSTEM Patent

Roger L Kessinger inventor (to NASA) (Martin Marietta Corp, Denver) Issued 20 Sep 1977 11 p Filed 8 Nov 1976 Supersedes N77-13335 (15 - 04, p 0465) Sponsored by NASA

(NASA-Case-MSC-14916-1 US-Patent-4 049 930, US-Patent-Appl-SN-739914, US-Patent-Class-179-175 1A, US-Patent-Class-179-107R, US-Patent-Class-330-2) Avail US Patent Office CSCL 09A

A malfunction detection system for detecting malfunctions in electrical signal processing circuits is disclosed Malfunctions of a hearing aid in the form of frequency distortion and/or inadequate amplification by the hearing aid amplifier, as well as weakening of the hearing aid power supply are detectable A test signal is generated and a timed switching circuit periodically applies the test signal to the input of the hearing aid amplifier in place of the input signal from the microphone The resulting amplifier output is compared with the input test signal used as a reference signal The hearing aid battery voltage is also periodically compared to a reference voltage Deviations from the references beyond preset limits cause a warning system to operate Official Gazette of the U S Patent Office

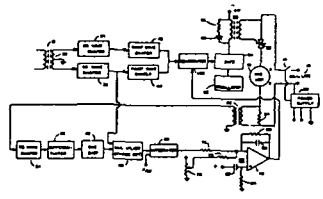


N78-10376* National Aeronautics and Space Administration Marshall Space Flight Center Huntsville Ala

POWER FACTOR CONTROL SYSTEM FOR AC INDUCTION MOTORS Patent

Frank J Nola, inventor (to NASA) Issued 4 Oct 1977 8 p Filed 19 Jul 1976 Supersedes N76-28471 (14 - 19 p 2454) (NASA-Case-MFS-23280-1, US-Patent-4,052,648 US-Patent-Appl-SN-706425, US-Patent-Class-318-200 US-Patent-Class-318-227 US-Patent-Class-318-230) Avail US Patent Office CSCL 09C

A power factor control system for use with ac induction motors was designed which samples lines voltage and current through the motor and decreases power input to the motor proportional to the detected phase displacement between current and voltage This system provides less power to the motor, as it is less loaded Official Gazette of the U S Patent Office



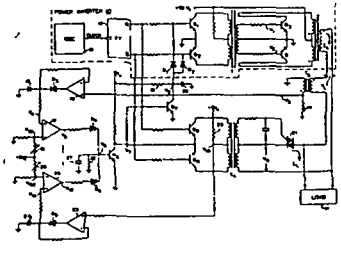
N78-10377* National Aeronautics and Space Administration Pasadena Office, Calif

OVERLOAD PROTECTION SYSTEM FOR POWER INVERTER Patent

Satoshi Nagano, inventor (to NASA) (JPL) Issued 4 Oct 1977 9 p Filed 15 Nov 1976 Supersedes N77-17359 (15 - 08 p 1025) Sponsored by NASA

(NASA-Case-NPO-13872-1, US-Patent-4 052,659 US-Patent-Appl-SN-742034 US-Patent-CLASS-363-57 US-Patent-Class-363-89) Avail US Patent Office CSCL 09C

An overload protection system for a power inverter utilized a first circuit for monitoring current to the load from the power inverter to detect an overload and a control circuit to shut off the power inverter, when an overload condition was detected At the same time, a monitoring current inverter was turned on to deliver current to the load at a very low power level A second circuit monitored current to the load from the monitoring current inverter, to hold the power inverter off through the control circuit until the overload condition was cleared so that the control circuit may be deactivated in order for the power inverter to be restored after the monitoring current inverter is turned off completely Official Gazette of the U S Patent Office



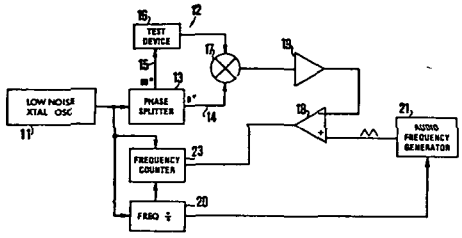
N78-15401*# National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt Md

TIME DOMAIN PHASE MEASURING APPARATUS Patent Application

Victor S Reinhardt inventor (to NASA) Filed 8 Dec 1977 17 p

(NASA-Case-GSC-12228-1 US-Patent-Appl-SN-858764) Avail NTIS HC A02/MF A01 CSCL 09A

An apparatus for deriving time domain measurements of the phase stability of a test device is described The amplitude of a dc signal indicative of the phase shift introduced by the tested device was compared with the amplitude of a ramp voltage Electrical and electronic devices as well as other devices introduce phase shift on signals that are coupled through them The amount of phase shift is not stable within the same device and there is a drift in phase shift as a function of ambient conditions such as temperature power supply voltage etc NASA



N78-13320* National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville Ala

GERMANIUM COATED MICROBRIDGE AND METHOD Patent

Louis B Holderman and Palmer N Peters inventors (to NASA) (NAS-NRC) Issued 25 Oct 1977 5 p Filed 13 Aug 1976 Supersedes N76-30084 (14 - 20 p 2670)

(NASA-Case-MFS-23274-1, US-Patent-4 055,847, US-Patent-Appl-SN-714158 US-Patent-Class-357-5, US-Patent-Class-357-4 US-Patent-Class-357-73, US-Patent-Class-307-306 US-Patent-Class-338-32S) Avail US Patent Office CSCL 09C

A superconducting microbridge is provided for use in superconducting quantum interference devices wherein a pair of spaced layers of superconductive material are connected by a weak link bridge to establish an electrical junction The superconductive layers and bridge are coated with a semiconductor material shunting the bridge at room temperatures to prevent the destruction of the device by minute electrical currents while the coating acts as a dielectric permitting normal electrical behavior of the microbridge at cryogenic temperatures

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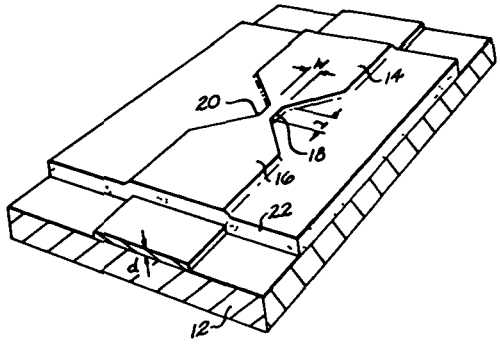

N78-17293* National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

PARTICLE PARAMETER ANALYZING SYSTEM Patent

David O Hansen (TRW Inc , Redondo Beach, Calif) and Neal L Roy inventors (to NASA) (TRW Inc , Redondo Beach, Calif) Issued 21 Jan 1969 5 p Filed 28 Jan 1966 Sponsored by NASA

(NASA-Case-XLE-06094, US-Patent-3 423,627, US-Patent-Appl-SN-523632 US-Patent-Class-315-22) Avail US Patent Office CSCL 09C

An X-Y plotter circuit apparatus is described which displays an input pulse representing particle parameter information, that would ordinarily appear on the screen of an oscilloscope as a rectangular pulse, as a single dot positioned on the screen where the upper right hand corner of the input pulse would have appeared If another event occurs, and it is desired to display this event, the apparatus is provided to replace the dot with a short horizontal line

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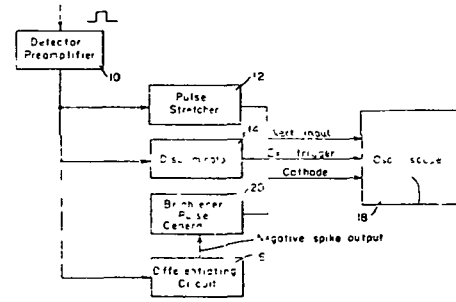


N78-17294* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex

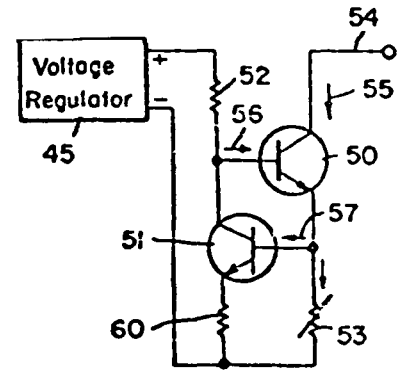
TEMPERATURE COMPENSATED CURRENT SOURCE Patent

David Roy Breuer inventor (to NASA) (TRW Inc Redondo Beach, Calif) Issued 6 Apr 1971 6 p Filed 16 Jan 1968 Sponsored by NASA

(NASA-Case-MSC-11235 US-Patent-3,573 504, US-Patent-Appl-SN-698239 US-Patent-Class-307-270, US-Patent-Class-307-297, US-Patent-Class-323-4, US-Patent-Class-328-172) Avail US Patent Office CSCL 09C

A current source was designed which is substantially independent of variations of temperature The current source may be made either to have a linear dependence upon changes of temperature or, by the simple addition of a resistor may be made substantially independent of temperature variations Since the current source consists only of transistors of one conductivity type and resistors it is ideally suited for manufacture in the form of a monolithic integrated circuit

Official Gazette of the U S Patent Office



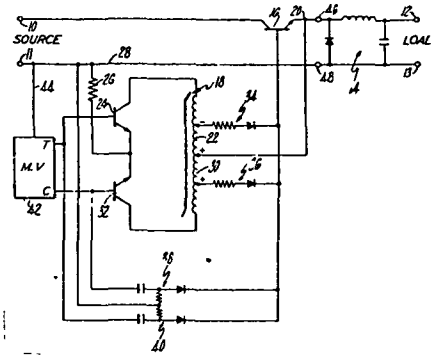
N78-17295* National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt, Md

TRANSFORMER REGULATED SELF-STABILIZING CHOPPER Patent

Frank L Raposa, inventor (to NASA) (United Aircraft Corp East Hartford Conn) Issued 28 Oct 1969 4 p Filed 22 Sep 1967 Sponsored by NASA

(NASA-Case-XGS-09186 US-Patent-3 475,675, US-Patent-Appl-SN-669911, US-Patent-Class-323-18) Avail US Patent Office CSCL 09C

A self-stabilizing voltage regulator is described Direct current voltage regulation employing a series transistor rendered conductive during various portions of a cycle is controlled by saturation of an autotransformer The constant volt-second capacity of the transformer provides conduction time inverse to the input voltage whereby average output voltage is maintained constant Conduction commensed in response to short gate signals and resistor feedback for degenerative turn-off of the transistor was after transformer saturation Standard output filters are also included Author



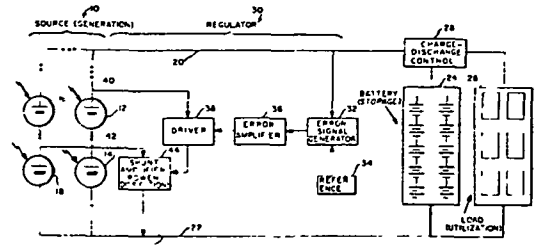
N78-17296* National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt, Md

SHUNT REGULATION ELECTRIC POWER SYSTEM Patent

Warren H Wright (TRW Inc Redondo Beach Calif) and John J Bless inventors (to NASA) (TRW Inc Redondo Beach, Calif) Issued 17 Aug 1971 9 p Filed 3 Oct 1968 Sponsored by NASA

(NASA-Case-GSC-10135 US-Patent-3 600,599, US-Patent-Appl-SN-764823 US-Patent-Class-307-53 US-Patent-Class-307-69 US-Patent-Class-320-53 US-Patent-Class-323-19) Avail US Patent Office CSCL 09C

A regulated electric power system having load and return bus lines is described A plurality of solar cells interconnected in a power supplying relationship and having a power shunt tap point electrically spaced from the bus lines is provided A power dissipator is connected to the shunt tap point and provides for a controllable dissipation of excess energy supplied by the solar cells A dissipation driver is coupled to the power dissipator and controls its conductance and dissipation and is also connected to the solar cells in a power taping relationship to derive operating power therefrom An error signal generator is coupled to the load bus and to a reference signal generator to provide an error output signal which is representative of the difference between the electric parameters existing at the load bus and the reference signal generator An error amplifier is coupled to the error signal generator and the dissipation driver to provide the driver with controlling signals Official Gazette of the U S Patent Office



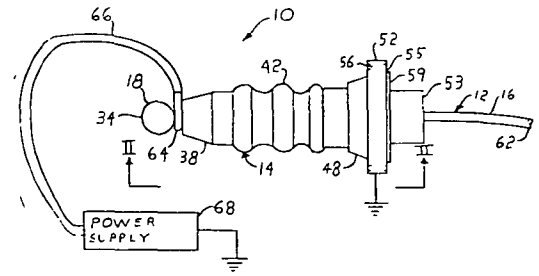
N78-17297*# National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt, Md

VOLTAGE FEED THROUGH APPARATUS HAVING REDUCED PARTIAL DISCHARGE Patent Application

Stephan R Peck (GE, Philadelphia) and Jeffrey W Benham inventors (to NASA) (GE, Philadelphia) Filed 10 Jan 1978 15 p

(NASA-Case-GSC-12347-1, US-Patent-Appl-SN-868249) Avail NTIS HC A02/MF A01 CSCL 09A

Voltage feed through apparatuses where the partial discharge occurrences were reduced to a magnitude of not more than five partial discharge occurrences are illustrated Voltage feed through apparatuses were used to properly measure partial discharge occurrences by items under test prior to their use in spacecraft and other hostile environments NASA



N78-18308* National Aeronautics and Space Administration Hugh L Dryden Flight Research Center Edwards Calif

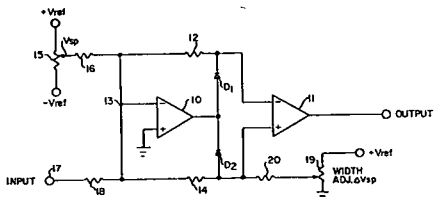
WINDOW COMPARATOR Patent

James M Black inventor (to NASA) Issued 25 Oct 1977 7 p Filed 2 Nov 1976 Supersedes N77-11296 (15 - 20 p 0184)

(NASA-Case-FRC-10090-1 US-Patent-4 055 777, US-Patent-Appl-SN-737974, US-Patent-Class-307-360, US-Patent-Class-307-350 US-Patent-Class-307-265, US-Patent-Class-328-150) Avail US Patent Office CSCL 09A

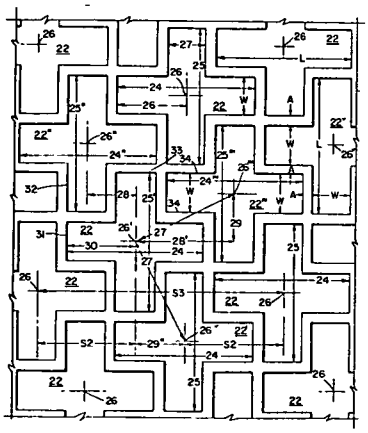
A window comparator is described, comprising two operational amplifiers one with two feedback circuits each feedback circuit having a diode connected to the amplifier output and poled for forward current conduction of opposite polarity to provide an algebraic difference between an input signal and a selected set-point voltage Differential input terminals of the second operational amplifier were connected to the separate feedback circuits of the first operational amplifier one input terminal to the output of one diode, and the other to the output of the other diode A selected window-width voltage was connected through a coupling resistor to one of the input terminals

of the second operational amplifier to determine when the algebraic difference of the input signal and the setpoint voltage has exceeded a predetermined tolerance after that difference has changed signs Official Gazette of the U S Patent Office



N78-18313*# National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt, Md
MICROWAVE DICHROIC PLATE Patent Application
Thomas E Wise inventor (to NASA) (Bendix Corp , Columbia, Md) Filed 16 Feb 1978 21 p Sponsored by NASA
(NASA-Case-GSC-12171-1, US-Patent-Appl-SN-878542) Avail NTIS HC A02/MF A01 CSCL 09C

A dichroic plate for microwave energy which includes an array of interlaced crossed slots or dipole elements was developed Each of the elements included first and second crossed arms that are at approximately right angles to each other and aligned with X and Y axes The elements were arranged so that the centers were aligned parallel to the X and Y axes to form columns and rows The interlacing was such that a line between the centers of all adjacent elements had non zero, differing components relative to the X and Y axes In one embodiment the spacing between adjacent arms of different adjacent elements was the same along the X and Y axes, while in a second embodiment, the spacing between similarly directed arms of adjacent elements differed from the spacing between oppositely directed arms of adjacent elements NASA



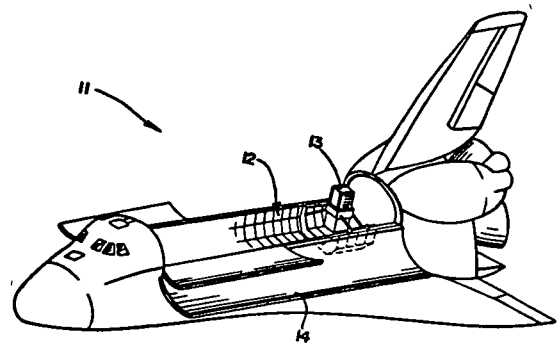
34 FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers hydrodynamics fluidics mass transfer and ablation cooling

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

N78-13380*# National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt, Md
THERMAL CONTROL CANISTER Patent Application
Stanford Ollendorf inventor (to NASA) Filed 21 Nov 1977 28 p
(NASA-Case-GSC-12253-1 US-Patent-Appl-SN-853677) Avail NTIS HC A03/MF A01 CSCL 20D

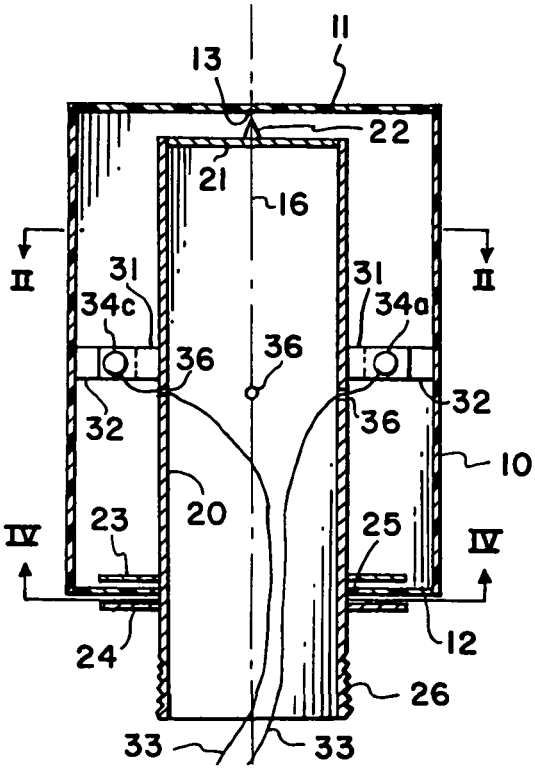
A heat dissipating instrument package of a spacecraft, located in a canister having walls in heat transfer relationship with the package, is maintained at a substantially constant temperature Fixed conductance heat pipes on the canister walls are connected to variable conductance heat pipes, mounted on a radiator structure separated from the canister walls by a thermal blanket The effective radiating area of the radiator structure is controlled by the variable conductance heat pipes in response to a comparison of a sensed temperature of the instrument package or the canister wall with a set point value The comparison controls a heater in a gas reservoir containing a non-condensable gas of the variable conductance heat pipe A thermal radiation shield for the gas reservoir prevents radiant energy from the exterior environment and thermal energy reflected from the spacecraft from overheating the non-condensable gas NASA



N78-15438*# National Aeronautics and Space Administration Langley Research Center Langley Station, Va
FLUID VELOCITY MEASURING DEVICE Patent Application
David F Thomas Jr and Leon A Williams Jr inventors (to NASA) Filed 30 Nov 1977 16 p
(NASA-Case-LAR-11729-1, US-Patent-Appl-SN-856461) Avail NTIS HC A02/MF A01 CSCL 20D

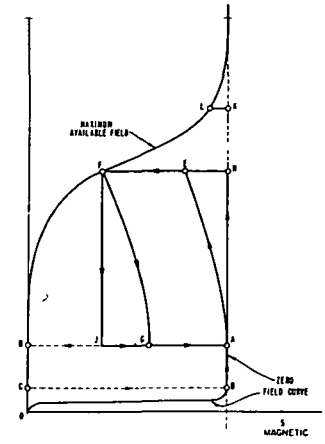
A fluid velocity measuring device positionable in a freesteam of fluid flow to cause vortices to be created at a frequency proportional to the rate of flow is described Sensors were utilized to generate signals representive of fluid velocity frequencies are proportional to fluid flow speed and the amplitudes of which are indicative of fluid flow direction The device includes a

housing mounted around a spindle fixed at one end to some reference structure Bearings provide a low friction contact and alignment between the housing and the mounting spindle to measure rotational forces caused by vortex creation and translational drag forces relative to the reference structure The sensors generate electric signals which are translated into indications of fluid flow speed and direction by additional electric circuitry NASA



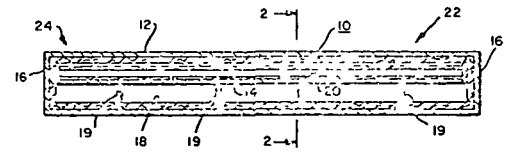
N78-17335* National Aeronautics and Space Administration Lewis Research Center Cleveland, Ohio
MAGNETIC HEAT PUMPING Patent
Gerald V Brown inventor (to NASA) Issued 17 Jan 1978 9 p Filed 30 Nov 1976 Supersedes N77-15343 (15 - 06 p 0750)
(NASA-Case-LEW-12508-1, US-Patent-4,069,028 US-Patent-Appl-SN-746580, US-Patent-Class-62-3) Avail US Patent Office CSCL 20D

A ferromagnetic or ferrimagnetic element is used to control the temperature and applied magnetic field of the element to cause the state of the element as represented on a temperature-magnetic entropy diagram to repeatedly traverse a loop The loop may have a first portion of concurrent substantially isothermal or constant temperature and increasing applied magnetic field a second portion of lowering temperature and constant applied magnetic field, a third portion of isothermal and decreasing applied magnetic field and a fourth portion of increasing temperature and constant applied magnetic field Other loops may be four-sided, with two isotherms and two adiabats Preferably, a regenerator is used to enhance desired cooling or heating effects, with varied magnetic fields or varying temperatures including three-sided figures traversed by the representative point
Official Gazette of the U S Patent Office



N78-17336* National Aeronautics and Space Administration Ames Research Center Moffett Field, Calif
HEAT PIPE WITH DUAL WORKING FLUIDS Patent
Arnold P Shlosinger, inventor (to NASA) (TRW Inc, Redondo Beach Calif) Issued 11 Dec 1973 6 p Filed 1 Jun 1970 Sponsored by NASA
(NASA-Case-ARC-10198, US-Patent-3,777,811, US-Patent-Appl-SN-42088 US-Patent-Class-165-105, U S-Patent-Class-165-134) Avail US Patent Office CSCL 20D

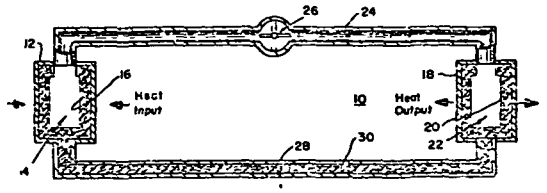
A heat pipe design is offered that utilizes an auxiliary working fluid The fluid although being less efficient than the main working fluid remains liquid at low heat loads when the main working fluid freezes Official Gazette of the U S Patent Office



N78-17337* National Aeronautics and Space Administration Ames Research Center Moffett Field Calif
MULTI-CHAMBER CONTROLLABLE HEAT PIPE Patent
Arnold P Shlosinger inventor (to NASA) (TRW Inc Redondo Beach Calif) Issued 1 Dec 1970 8 p Filed 14 May 1969 Sponsored by NASA
(NASA-Case-ARC-10199 US-Patent-3 543,839, US-Patent-Appl-SN-824628, US-Patent-Class-165-32, US-Patent-Class-2-2 1, US-Patent-Class-165-96 US-Patent-Class-165-105) Avail US Patent Office CSCL 20D

A temperature controllable heat pipe switching device is reported It includes separate evaporating and condensing chambers interconnected by separate vapor flow and liquid return conduits The vapor flow conduit can be opened or closed to the flow of vapor whereas the liquid return conduit blocks vapor flow at all times When the vapor flow path is open the device has high thermal conductivity and when the vapor flow path is blocked the device has low thermal conductivity

Official Gazette of the U S Patent Office



N78-18355* National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio
THERMAL BARRIER COATING SYSTEM Patent
Stephan Stecura and Curt H Leibert, inventors (to NASA) Issued 25 Oct 1977 3 p Filed 14 May 1978 Supersedes N76-23359 (14 - 14, p 1773)
(NASA-Case-LEW-12554-1 US-Patent-4,055 705, US-Patent-Appl-SN-686449, US-Patent-Class-428-633, US-Patent-Class-428-652, US-Patent-Class-428-667, US-Patent-Class-427-405, US-Patent-Class-427-419A, US-Patent-Class-427-34 US-Patent-Class-427-423) Avail US Patent Office CSCL 20D

A coating system which contains a bond coating and a thermal barrier coating is applied to metal surfaces such as turbine blades and provides both low thermal conductivity and improved adherence when exposed to high temperature gases or liquids The bond coating contains NiCrAlY and the thermal barrier coating contains a reflective oxide The reflective oxides ZrO2-Y2O3 and ZrO2-MgO have demonstrated significant utility in high temperature turbine applications

Official Gazette of the U S Patent Office

35 INSTRUMENTATION AND PHOTOGRAPHY

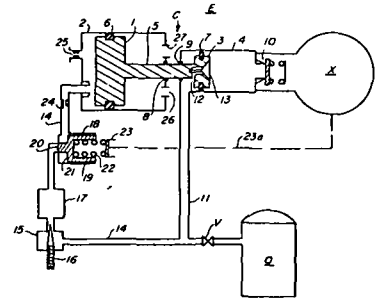
Includes remote sensors measuring instruments and gages detectors cameras and photographic supplies and holography

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

N78-10428* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex
GAS COMPRESSION APPARATUS Patent
Leslie S Terp, inventor (to NASA) (Garrett Corp Los Angeles) Issued 4 Oct 1977 8 p Filed 24 Oct 1975 Supersedes N76-13496 (14 - 04 p 0459) Sponsored by NASA
(NASA-Case-MSC-14757-1 US-Patent-4 051,877 US-Patent-Appl-SN-625734 US-Patent-Class-141-4, US-Patent-Class-60-560 US-Patent-Class-60-574 US-Patent-Class-141-197 US-Patent-Class-417-225) Avail US Patent Office CSCL 14B

Apparatus for transferring gas from a first container to a second container of higher pressure was devised A free-piston compressor having a driving piston and cylinder and a smaller diameter driven piston and cylinder, comprise the apparatus A rod member connecting the driving and driven pistons functions for mutual reciprocation in the respective cylinders A conduit may be provided for supplying gas to the driven cylinder from the first container Also provided is apparatus for introducing gas to the driving piston, to compress gas by the driven piston for transfer to the second higher pressure container The system is useful in transferring spacecraft cabin oxygen into higher pressure containers for use in extravehicular activities

Official Gazette of the U S Patent Office



N78-10429* National Aeronautics and Space Administration Pasadena Office, Calif
PHOTOELECTRON SPECTROMETER WITH MEANS FOR STABILIZING SAMPLE SURFACE POTENTIAL Patent
Frank J Grunthaner (JPL) and Blair F Lewis inventors (to NASA) (JPL) Issued 4 Oct 1977 11 p Filed 9 Apr 1976 Supersedes N76-26450 (14 - 17 p 2189) Sponsored by NASA
(NASA-Case-NPO-13772-1 US-Patent-4 052 614 US-Patent-Appl-SN-675351 US-Patent-Class-250-310, US-Patent-Class-250-398) Avail US Patent Office CSCL 14B

An improved X-ray photoelectron spectrometer is disclosed, which includes circuit means to determine the surface potential of a sample, e g an insulator The circuit means comprise an electron gun whose potential is modulated at a preselected frequency above and below a selected potential with respect to the spectrometer common potential, e g ground The beam of electrons is directed to the sample surface The sample s surface potential is offset by an offset power supply with respect to the spectrometer common potential until the ac current which flows through the sample reaches a peak amplitude A lock-in amplifier is included to measure the ac current in phase with the modulating frequency

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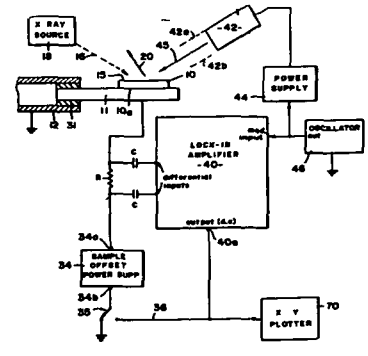
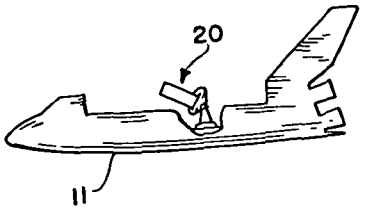


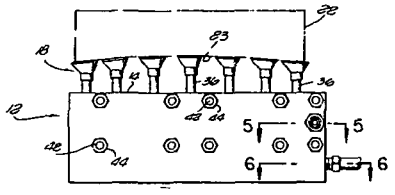
N78-10433*# National Aeronautics and Space Administration Langley Research Center, Langley Station, Va
MAGNETIC SUSPENSION AND POINTING SYSTEM Patent Application
Willard W Anderson and Nelson J Groom inventors (to NASA) Filed 17 Jun 1977 10 p
(NASA-Case-LAR-11889-2 US-Patent-Appl-SN-807703) Avail NTIS HC A02/MF A01 CSCL 14B

An apparatus is described for providing accurate pointing of instruments on a carrier vehicle and for providing isolation of the instruments from the vehicle s motion disturbances The apparatus includes two assemblies, with connecting interfaces, each assembly having a separate function The first assembly is attached to the carrier vehicle and consists of an azimuth gimbal and an elevation gimbal which provide coarse pointing of the instruments by allowing two rotations of the instruments relative to the carrier vehicle The second or vernier pointing assembly is made up of magnetic suspension and fine pointing actuators, roll motor segments and an instrument mounting plate around which a continuous annular rim is attached which provides appropriate magnetic circuits for the actuators and the roll motor segments The vernier pointing assembly is attached to the elevation gimbal and provides vernier attitude fine pointing and roll positioning of the instruments as well as six degree-of-freedom isolation from carrier motion disturbances NASA



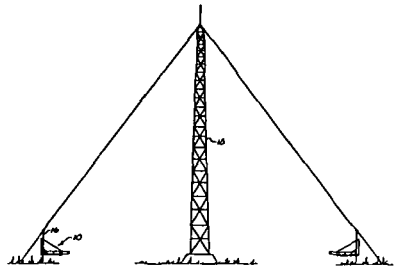
N78-10434*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston Tex
VARIABLE CONTOUR SECURING SYSTEM Patent Application
Paul P Zebus (Rockwell International Downey, Calif), Cyrus C Haynie (Rockwell International Downey Calif) and Poley N Packer inventors (to NASA) (Rockwell International Downey, Calif) Filed 27 Sep 1977 14 p Sponsored by NASA
(NASA-Case-MSC-16270-1, US-Patent-Appl-SN-837260) Avail NTIS HC A02/MF A01 CSCL 14B

A vacuum operated holding fixture for securing parts of variable contour is reported The retaining mechanism includes a spaced array of adjustable spindles mounted on a housing Each spindle has a base member support cup at one end thereof A vacuum source is applied to the cups for seating the member adjacent to the cups A locking mechanism sets the spindles in a predetermined position once the member has been secured to the spindle support cups NASA



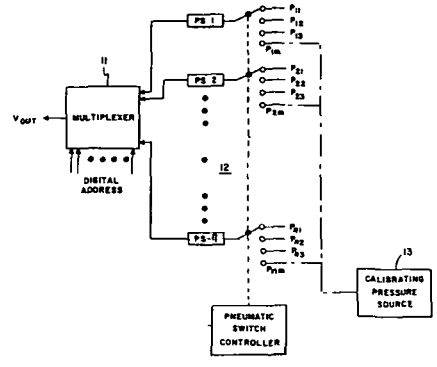
N78-10435*# National Aeronautics and Space Administration John F Kennedy Space Center, Cocoa Beach, Fla
LIGHTNING CURRENT DETECTOR Patent Application
Stephen F Livermore, inventor (to NASA) Filed 22 Sep 1977 12 p
(NASA-Case-KSC-11057-1, US-Patent-Appl-SN-835544) Avail NTIS HC A02/MF A01 CSCL 14B

An apparatus is outlined for measuring the intensity of current produced in an elongated electrical conductive member by a lightning strike 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 the elongated strip of magnetic material One end of the magnetic material is positioned closely adjacent to the electrically conductive member so that the magnetic field produced by current flowing through the member disturbs a portion of the recorded electrical signal directly proportional to the intensity of the lightning strike NASA



N78-11370*# National Aeronautics and Space Administration Langley Research Center Langley Station Va
AN ELECTRICALLY SCANNED PRESSURE SENSOR MODULE WITH IN SITU CALIBRATION CAPABILITY Patent Application
Chris Gross inventor (to NASA) Filed 22 Sep 1977 17 p
(NASA-Case-LAR-12230-1 US-Patent-Appl-SN-835628) Avail NTIS HC A02/MF A01 CSCL 14B

A high data rate pressure sensor module with an in situ calibration capability to help reduce energy consumption in wind tunnel facilities without loss of measurement accuracy is described 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 allows mounting within many wind tunnel models thus eliminating long tube lengths and their corresponding slow pressure response NASA



N78-12390* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex
LOW GRAVITY PHASE SEPARATOR Patent
George F Smoot (Calif Univ, Berkeley), William L Pope (Calif Univ, Berkeley), and Lawrence Smith, inventors (to NASA) (Calif Univ, Berkeley) Issued 7 Jun 1977 6 p Filed 12 Sep 1975 Supersedes N75-32262 (13 - 23, p 2897) Sponsored by NASA
(NASA-Case-MSC-14773-1, US-Patent-4,027,494, US-Patent-Appl-SN-612966, US-Patent-Class-62-50, US-Patent-Class-55-3, US-Patent-Class-55-100, US-Patent-Class-55-26-9, US-Patent-Class-62-514R, US-Patent-Class-137-197, US-Patent-Class-210-222) Avail US Patent Office CSCL 14B

An apparatus is described for phase separating a gas-liquid mixture as might exist in a subcritical cryogenic helium vessel for cooling a superconducting magnet at low gravity such as in planetary orbit permitting conservation of the liquid and extended service life of the superconducting magnet

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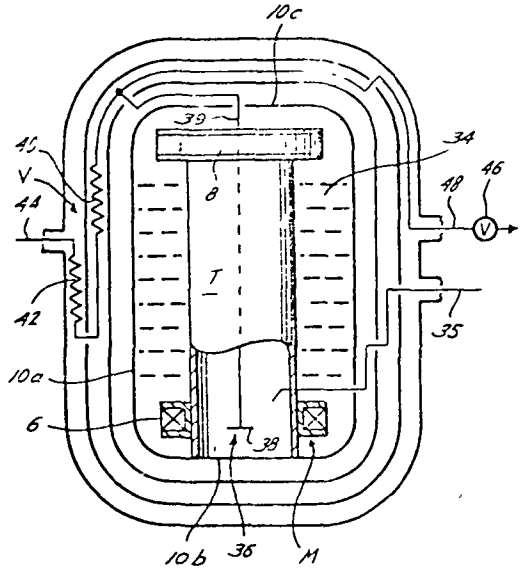

N78-13400* National Aeronautics and Space Administration Ames Research Center Moffett Field Calif
OPTICALLY SELECTIVE, ACOUSTICALLY RESONANT GAS DETECTING TRANSDUCER Patent
John Dimeff inventor (to NASA) Issued 25 Oct 1977 6 p Filed 22 Dec 1975 Supersedes N77-19388 (15 - 10, p 1310)
(NASA-Case-ARC-10639-1 US-Patent-4,055,764, US-Patent-Appl-SN-643043, US-Patent-Class-250-336, US-Patent-Class-250-343 US-Patent-Class-250-351) Avail US Patent Office CSCL 14B

A gas analyzer is disclosed which responds to the resonant absorption or emission spectrum of a specific gas by producing an acoustic resonance in a chamber containing a sample of that gas, and which measures the amount of that emission or absorption by measuring the strength of that acoustic resonance, e g the maximum periodic pressure, velocity or density achieved In the preferred embodiment, a light beam is modulated periodically at the acoustical resonance frequency of a closed chamber which contains an optically dense sample of the gas of interest Periodic heating of the absorbing gas by the light beam causes a cyclic expansion movement and pressure within the gas An amplitude is reached where the increased losses were the cyclic radiation energy received A transducing system is inclined for converting the pressure variations of the resonant gas into electronic readout signals

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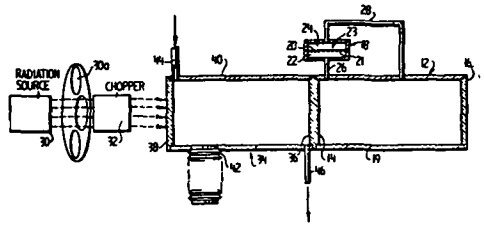

N78-14364* National Aeronautics and Space Administration Ames Research Center Moffett Field, Calif
FLOW SEPARATION DETECTOR Patent
George C Mateer and Aviel Brosh, inventors (to NASA) (NAS-NRC) Issued 6 Dec 1977 8 p Filed 6 Aug 1976 Supersedes N76-28535 (14 - 19 p 2462)
(NASA-Case-ARC-11046-1 US-Patent-4 061 029 US-Patent-Appl-SN-712419 US-Patent-Class-73-180, US-Patent-Class-340-27SS) Avail US Patent Office CSCL 14B

An arrangement for sensing the fluid separation along a surface which employs a thermally insulating element having a continuous surface blending into and forming a part of the fluid flow surface is described A sudden decrease in the temperature of the downstream sensor conductor and concomitant increase in the temperature of the upstream sensor conductor is an indication of the separation When the temperatures are returned to the state achieved during normal flow, the indicator thereby indicates the normal attached fluid flow The conductors may be, for example wires or thin films, and should be within the viscous sub-layer of the expected fluid flow A single heater and several pairs of sensors and corresponding sensor conductors may be used to detect not only the fluid flow and the separation but the direction of the fluid flow over the fluid flow surface

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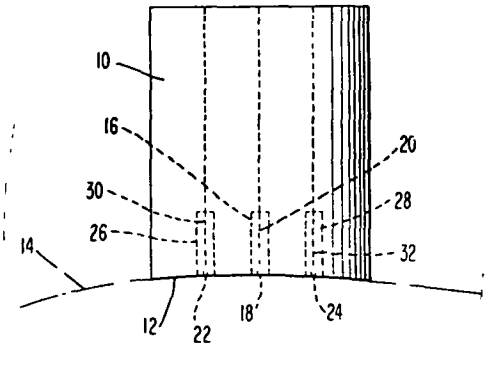

N78-15461* National Aeronautics and Space Administration Pasadena Office Calif

SELECTIVE IMAGE AREA CONTROL OF X-RAY FILM EXPOSURE DENSITY Patent

C Martin Berdahl inventor (to NASA) (JPL) Issued 13 Dec 1977 5 p Filed 9 Apr 1976 Supersedes N77-24456 (15 - 15, p 1993) Sponsored by NASA
(NASA-Case-NPO-13808-1, US-Patent-4,063 092
US-Patent-Appl-SN-675328 US-Patent-Class-250-322
US-Patent-Class-250-416TV) Avail US Patent Office CSCL 14E

A system for accurately determining the exposure density required for X-ray photography of a particular area of interest is provided The light received from an X-ray image intensifier is applied to a beam splitting mirror which divides the light between a motion picture film camera and a television film camera Between the beam splitter and the motion picture film camera, there is positioned another light beam splitter to direct some of the light at a mask having an opening which encloses only the image area of interest Behind that opening there is positioned a photomultiplier intensity sensor for determining the exposure required and varying X-ray beam intensity accordingly

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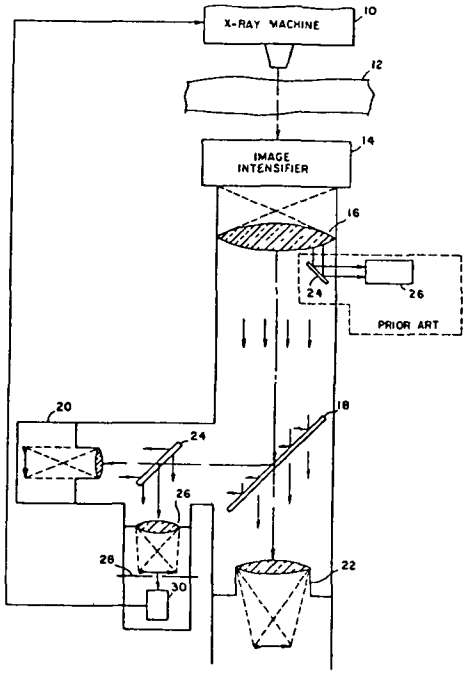
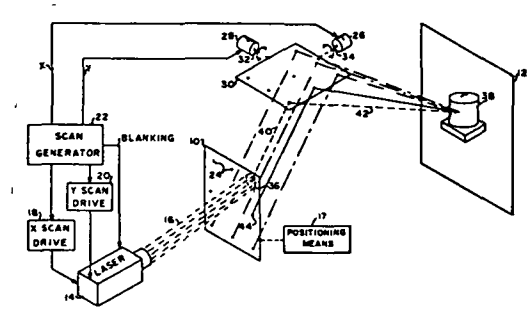


N78-17357* National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala

PROJECTION SYSTEM FOR DISPLAY OF PARALLAX AND PERSPECTIVE Patent

Robert L Kurtz, inventor (to NASA) Issued 27 Dec 1977 4 p Filed 6 Nov 1975 Supersedes N76-13909 (14 - 04, p 0511)
(NASA-Case-MFS-23194-1 US-Patent-4,065 202,
US-Patent-Appl-SN-629458, US-Patent-Class-350-3 5) Avail US Patent Office CSCL 20E

A projection system for the display of parallax and perspective of a real image from a hologram is presented A reference beam was projected in a sequence of several projections at selected angles of perspective through the hologram this sequence being rapidly performed The resulting angular spaced images emitting from the hologram were directed onto a mirror which was coordinately tilted to reflect all of the resulting images to register onto a screen where they appeared as a single three dimensional image Official Gazette of the U S Patent Office

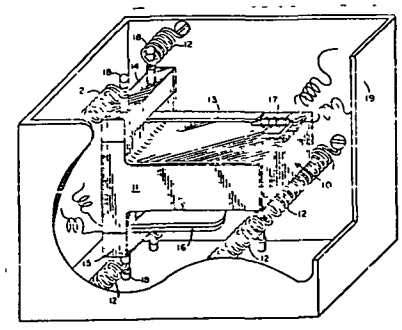


N78-17358* National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston, Tex

MICROBALANCE Patent

Lee O Heflinger (TRW Inc Redondo Beach Calif) and Ralph F Wuerker inventors (to NASA) Issued 3 Feb 1970 6 p Filed 8 May 1967 Sponsored by NASA
(NASA-Case-MSC-11242 US-Patent-3 492 858
US-Patent-Appl-SN-636796, US-Patent-Class-73-67 2) Avail US Patent Office CSCL 14B

A reed is vibrated by the minute vibrations of a base frame which in turn is vibrated by a driver mechanism The vibration of the reed is picked off and fed back to the driver means causing the base frame to be vibrated at the resonant frequency of the reed A counter is connected to the feedback loop to measure the frequency of the reed oscillations By adding the mass to be weighed to the reed the resonant frequency of the reed will be changed which will in turn change the reading at the counter by an amount which is proportional to the added mass Official Gazette of the U S Patent Office

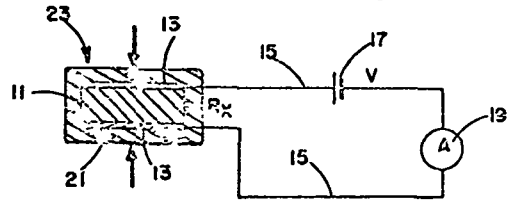


N78-17359* National Aeronautics and Space Administration Pasadena Office, Calif

PRESSURE TRANSDUCER Patent

Alan Rembaum inventor (to NASA) (JPL) Issued 8 Feb 1972 4 p Filed 18 Sep 1969 Sponsored by NASA (NASA-Case-NPO-11150, US-Patent-3,641,470, US-Patent-Appl-SN-858950 US-Patent-Class-338-99, US-Patent-Class-338-36 US-Patent-Class-338-100) Avail US Patent Office CSCL 14B

A pressure transducer is described in which the sensing element is a crystal of the monomeric charge transfer complex of pyrene and tetracyanoethylene A H



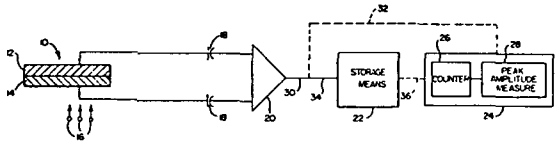
N78-18390* National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala

SEMICONDUCTOR PROJECTILE IMPACT DETECTOR Patent

Edward L Shriver, inventor (to NASA) Issued 25 Oct 1977 4 p Filed 11 Mar 1976 Supersedes N76-19405 (14 - 10, p 1252) (NASA-Case-MFS-23008-1 US-Patent-4,055 089, US-Patent-Appl-SN-665734, US-Patent-Class-73-432R, US-Patent-Class-73-28, US-Patent-Class-73-432PS, US-Patent-Class-73-DIG 11) Avail US Patent Office CSCL 14B

A semiconductor projectile impact detector is described for use in determining micrometeorite presence as well as its flux and energy comprising a photovoltaic cell which generates a voltage according to the light and heat emitted by the micrometeorites upon impact A counter and peak amplitude measuring device were used to indicate the number of particules which strike the surface of the cell as well as the kinetic energy of each of the particles

Official Gazette of the U S Patent Office

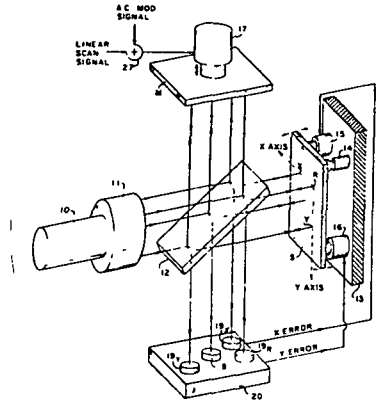


N78-18391* National Aeronautics and Space Administration Pasadena Office, Calif

INTERFEROMETER MIRROR TILT CORRECTING SYSTEM Patent

Rudolf A Schindler, inventor (to NASA) (JPL) Issued 11 Oct 1977 8 p Filed 18 Dec 1975 Supersedes N76-14433 (14 - 05, p 0581) Sponsored by NASA (NASA-Case-NPO-13687-1 US-Patent-4,053 231 US-Patent-Appl-SN-641803 US-Patent-Class-356-106S, US-Patent-Class-356-110) Avail US Patent Office CSCL 14B

An interferometer is described, having several means for automatically adjusting the angular tilt of a reflecting surface in one of two paths to maintain the exit beams from the two paths parallel to each other Three detectors at the output of the interferometer were disposed on mutually perpendicular axes which define a plane normal to the nominal exit beam axis One detector at the origin of the axes was used as a reference for separate phase difference comparison with the outputs of the other two detectors on the X and Y axes to develop servo error signals Official Gazette of the U S Patent Office

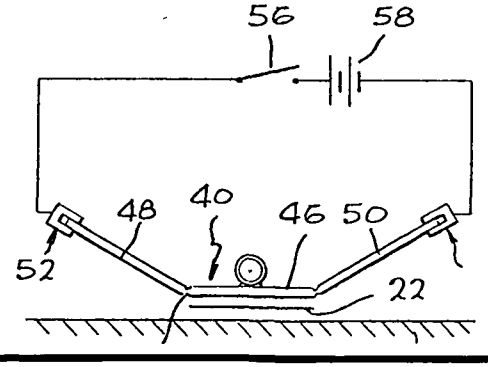


N78-18393*# National Aeronautics and Space Administration Hugh L Dryden Flight Research Center, Edwards, Calif

ATTACHING OF STRAIN GAGES TO SUBSTRATES Patent Application

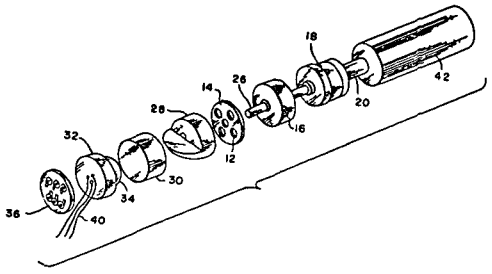
Meyer M Lemcoe (Battelle Columbus Labs, Ohio) and Harry E Pattee, inventors (to NASA) (Battelle Columbus Labs, Ohio) Filed 16 Feb 1978 10 p (Contract NAS4-2020) (NASA-Case-FRC-10093-1, US-Patent-Appl-SN-878539) Avail NTIS HC A02/MF A01 CSCL 14B

A method and apparatus for attaching strain gages to substrates was developed which is especially useful for field installation, and especially for materials which experience a drastic reduction in fatigue strength when heated as in spot welding A strain gage having a backing plate is attached to a substrate by using a foil of brazing material between the backing plate and substrate A pair of electrodes that are connected to a current source, are applied to opposite sides of backing plate so that heating of the structure occurs primarily along the relatively highly conductive foil of brazing material Field installations are facilitated by utilizing a backing plate with wings extending at an upward incline from either sider of the backing plate, by attaching the electrodes to the wings to perform the brazing operation, and by breaking off the wings after the brazing is completed NASA



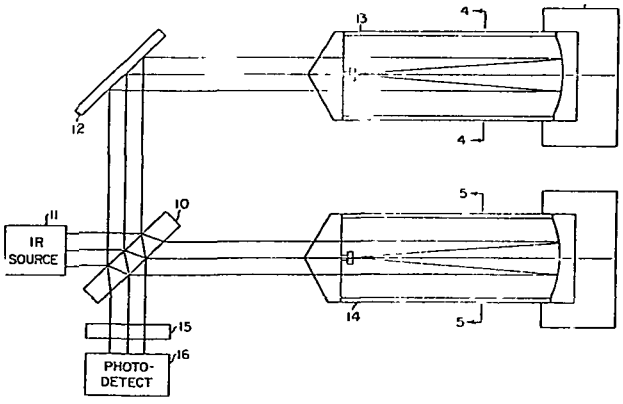
N78-18394*# National Aeronautics and Space Administration Langley Research Center Langley Station Va
SOLAR CELL ANGULAR POSITION TRANSDUCER Patent Application
Maynard C Sandford and David L Gray, inventors (to NASA) Filed 9 Feb 1978 18 p
(NASA-Case-LAR-11999-1, US-Patent-Appl-SN-876299) Avail NTIS HC A02/MF A01 CSCL 14B

A device that can accurately ascertain the angular position of an object was developed It has been used to determine the position of control surfaces of a wind tunnel scaled model airplane The angular position transducer uses a light source directed toward two photo cells A control surface shaft is rotated from a zero null position and one solar cell receives more illumination than the other, producing a differential voltage between the two cells This voltage is directly proportional to the shaft rotational angle The voltage is amplified by a high gain surface angular position NASA



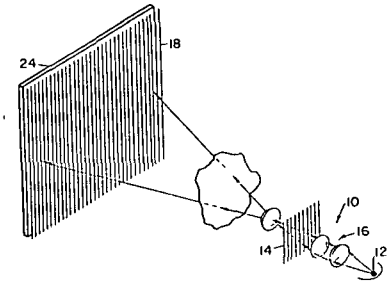
N78-18395*# National Aeronautics and Space Administration Pasadena Office, Calif
OVER-UNDER DOUBLE-PASS INTERFEROMETER Patent Application
Rudolf A Schindler inventor (to NASA) (JPL) Filed 8 Dec 1977 12 p
(Contract NAS7-100)
(NASA-Case-NPO-13999-1 US-Patent-Appl-SN-858596) Avail NTIS HC A02/MF A01 CSCL 14B

An over-under double pass interferometer in which the beamsplitter area and thickness can be reduced to conform only with optical flatness considerations was achieved by offsetting the optical center line of one cat s-eye retroreflector relative to the optical center line of the other in order that one split beam be folded into a plane distinct from the other folded split beam The beamsplitter is made transparent in one area for a first folded beam to be passed to a mirror for doubling back and is made totally reflective in another area for the second folded beam to be reflected to a mirror for doubling back The two beams thus doubled back are combined in the central beamsplitting area of the beamsplitting and passed to a detector This makes the beamsplitter insensitive to minimum thickness requirements and selection of material NASA



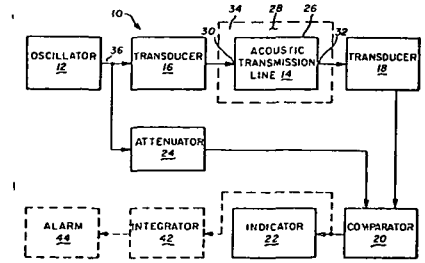
N78-18396*# National Aeronautics and Space Administration Pasadena Office, Calif
A SYSTEM AND METHOD FOR OBTAINING WIDE SCREEN SCHLIEREN PHOTOGRAPHS Patent Application
Shakkottai P Parthasarathy, inventor (to NASA) (JPL) Filed 9 Feb 1978 10 p
(Contract NAS7-100)
(NASA-Case-NPO-14174-1, US-Patent-Appl-SN-876441) Avail NTIS HC A01/MF A01 CSCL 14E

A system and method are presented for obtaining wide screen schlieren photographs by imaging a first optical grating against a large grating to form a moire pattern as a background The invention is embodied in a system including a screen a large grating adjacently related to the screen a small grating disposed in spaced relation with the large grating a transparent retainer for confining a fluid medium between the gratings and optics for imaging the small grating on the large grating including a light source and on optically aligned lens for projecting a beam of light along an axis extending through the small grating and striking the large grating, subsequent to passing through the medium for thus forming on the screen a schlieren image consisting of striations resulting from distortions of light rays produced by the medium, and a camera for photographing the schlieren image NASA



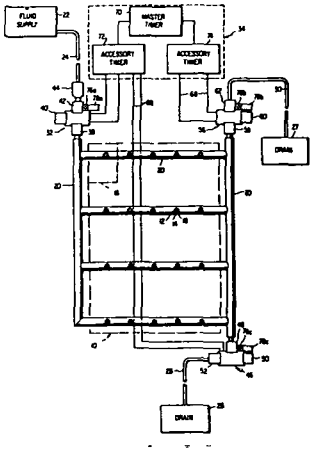
N78-19465* National Aeronautics and Space Administration Ames Research Center, Moffett Field Calif
APPARATUS FOR MEASURING A SORBATE DISPERSED IN A FLUID STREAM Patent
Otis L Updike, inventor (to NASA) (Va Univ Charlottesville) Issued 25 Oct 1977 10 p Filed 19 Sep 1975 Supersedes N75-32389 (13 - 23 p 2914) Sponsored by NASA
(NASA-Case-ARC-10896-1 US-Patent-4,055,072, US-Patent-Appl-SN-615030, US-Patent-Class-73-23) Avail US Patent Office CSCL 14B

A sensitive, miniature apparatus was designed for measuring low concentrations of a sorbate dispersed in a fluid stream The device consists of an elongated body having a surface capable of sorbing an amount of the sorbate proportional to the concentration in the fluid stream and propagating acoustic energy along its length The acoustic energy is converted to an electrical output signal corresponding to the concentration of sorbate in the fluid stream The device can be designed to exhibit high sensitivity to extremely small amounts of sorbate dispersed in a fluid stream and to exhibit low sensitivity to large amounts of sorbate Another advantage is that the apparatus may be formed in a microminiature size and at a low cost using bath microfabrication technology Official Gazette of the U S Patent Office



N78-19466* National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif
AUTOMATIC FLUID DISPENSER Patent
Peter C Sakellaris, inventor (to NASA) Issued 25 Oct 1977 6 p Filed 8 Oct 1975 Supersedes N75-32766 (13 - 23, p 2963)
(NASA-Case-ARC-10820-1, US-Patent-4,055,147, US-Patent-Appl-SN-620675, US-Patent-Class-119-72 5, US-Patent-Class-119-51 11, US-Patent-Class-137-624 11) Avail US Patent Office CSCL 14B

Fluid automatically flows to individual dispensing units at predetermined times from a fluid supply and is available only for a predetermined interval of time after which an automatic control causes the fluid to drain from the individual dispensing units Fluid deprivation continues until the beginning of a new cycle when the fluid is once again automatically made available at the individual dispensing units
Official Gazette of the U S Patent Office

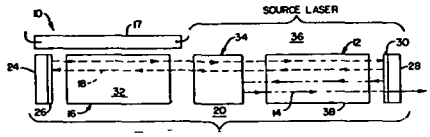


36 LASERS AND MASERS

Includes parametric amplifiers

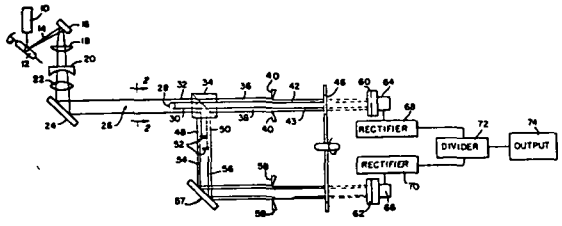
N78-10445*# National Aeronautics and Space Administration Goddard Inst for Space Studies New York
A LASER APPARATUS Patent Application
Gerhard A Koepf, inventor (to NASA) (NAS-NRC) Filed 29 Sep 1977 19 p Sponsored by NASA
(NASA-Case-GSC-12237-1 US-Patent-Appl-SN-837795) Avail NTIS HC A02/MF A01 CSCL 20E

A laser apparatus is reported that uses a pump laser device for producing pump laser energy upon being excited The pump laser device has a resonating cavity for oscillating and amplifying the pump laser energy A source laser device is energy upon being excited by the pump laser energy, the source laser device having a resonating cavity for oscillating and amplifying the source laser energy The source laser's resonating cavity is coupled within a portion of the pump laser's resonating cavity NASA



N78-14380* National Aeronautics and Space Administration Marshall Space Flight Center Huntsville Ala
LASER EXTENSOMETER Patent
Phillip J Stocker (Rockwell International Corp, Canoga Park Calif) and Harris L Marcus, inventors (to NASA) (Rockwell International Corp, Canoga Park Calif) Issued 6 Dec 1977 5 p Filed 15 Oct 1976 Supersedes N77-10516 (15 - 01, p 0071) Sponsored by NASA
(NASA-Case-MFS-19259-1 US-Patent-4 061 427, US-Patent-Appl-SN-732630, US-Patent-Class-356-159, US-Patent-Class-250-571 US-Patent-Class-356-160 U S-Patent-Class-356-199) Avail US Patent Office CSCL 20E

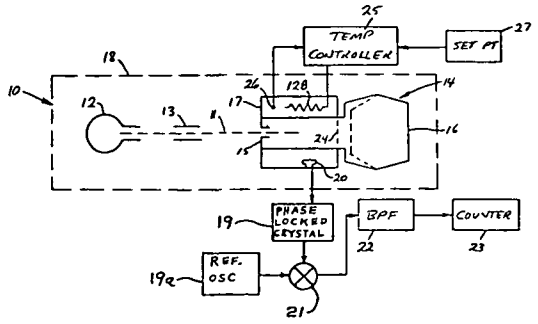
A drift compensated and intensity averaged extensometer for measuring the diameter or other properties of a substantially cylindrical sample based upon the shadow of the sample is described A beam of laser light is shaped to provide a beam with a uniform intensity along an axis normal to the sample After passing the sample the portion of the beam not striking said sample is divided by a beam splitter into a reference signal and a measurement signal Both of these beams are then chopped by a light chopper to fall upon two photodiode detectors The resulting ac currents are rectified and then divided into one another with the final output being proportional to the size of the sample shadow Official Gazette of the U S Patent Office



N78-15474*# National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt, Md
EXTERNAL BULB VARIABLE VOLUME MASER Patent Application
Victor S Reinhardt and Peter O Ceruenka inventors (to NASA) (Phoenix Corp McLean Va) Filed 30 Nov 1977 27 p
(NASA-Case-GSC-12334-1 US-Patent-Appl-SN-856464) Avail NTIS HC A03/MF A01 CSCL 21E

A maser functioning as a frequency standard that includes a variable volume constant surface area storage bulb is described The 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 fired 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 The maser is operated so that the zero wall shift frequency can be determined by being operated at first and second accurately controlled temperatures for identical small and large volumes From the two temperatures and volumes the zero wall shift frequency was determined as the intersection of two straight lines NASA



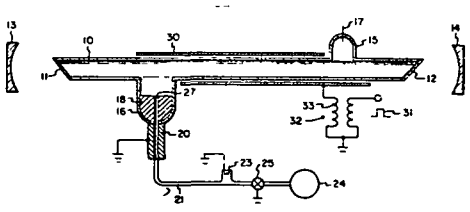
N78-17366* National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala

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) Issued 6 May 1975 5 p Filed 10 Sep 1973 Sponsored by NASA

(NASA-Case-MFS-22597, 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 Office CSCL 20E

The valve and the pressure gauge of a gas ion laser were 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 instead The cold cathode was provided with a central aperture to which was connected both the pressure gauge and the gas pressure reservoir through the valve This will effectively prevent 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 Office



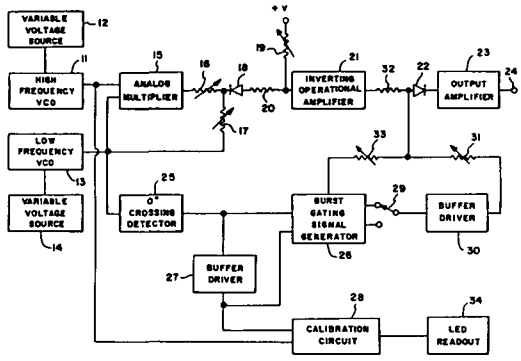
N78-17367*# National Aeronautics and Space Administration Langley Research Center Langley Station, Va

A VERSATILE LDV BURST SIMULATOR Patent Application

Otto Youngbluth Jr inventor (to NASA) Filed 16 Dec 1977 15 p

(NASA-Case-LAR-11859-1 US-Patent-Appl-SN-861396) Avail NTIS HC A02/MF A01 CSCL 20E

A device that generates burst signals which were suitable for determining whether or not a laser Doppler velocimeter was operating properly is described Means are presented for independently varying the information and pedestal frequencies, for adding asymmetry to the generated burst pulses, and for selecting several different combinations of burst signals NASA



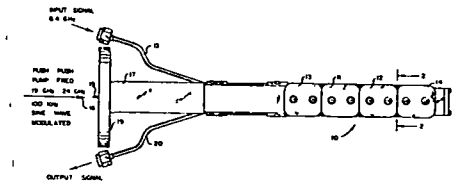
N78-18410* National Aeronautics and Space Administration Pasadena Office Calif

INDEPENDENT GAIN AND BANDWIDTH CONTROL OF A TRAVELING WAVE MASER Patent

David L. Trowbridge, inventor (to NASA) (JPL) Issued 25 Oct 1977 7 p Filed 26 Jul 1976 Supersedes N76-31514 (14 - 22 p 2870) Sponsored by NASA

(NASA-Case-NPO-13801-1, US-Patent-4,055,810, US-Patent-Appl-SN-708796 US-Patent-Class-330-4 US-Patent-Class-332-7 5) Avail US Patent Office CSCL 20E

An X-band traveling wave maser of the folded-comb type is presented, with two figure-eight coils for gain and bandwidth control One figure-eight coil covers the full lengths of the comb structure for bandwidth adjustment of an external magnetic field The other coil covers a central half of the comb structure for independent gain adjustment of the external magnetic field The half of each figure-eight coil at the turn around end of the comb structure is oriented to aid the external magnetic field, and the half of each coil at the input-output end of the comb structure is oriented to buck the external magnetic field The maser is pumped in the push-push mode with two different frequencies Official Gazette of the U S Patent Office



37 MECHANICAL ENGINEERING

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

N78-10467* National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

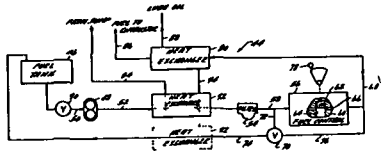
OIL COOLING SYSTEM FOR A GAS TURBINE ENGINE Patent

George A Coffinberry (GE Cincinnati) and Howard B Kast, inventors (to NASA) (GE Cincinnati) Issued 16 Aug 1977 10 p Filed 17 Jul 1975 Sponsored by NASA

(NASA-Case-LEW-12321-1 US-Patent-4,041 697 US-Patent-Appl-SN-596641 US-Patent-Class-60-39 28R US-Patent-Class-60-39 66 US-Patent-Class-415-180 US-Patent-Class-123-41 33 US-Patent-Class-123-122E US-Patent-Class-137-104) Avail US Patent Office CSCL 21E

A gas turbine engine fuel delivery and control system is provided with means to recirculate all fuel in excess of fuel control requirements back to aircraft fuel tank, thereby increasing the fuel pump heat sink and decreasing the pump temperature rise without the addition of valving other than that normally employed A fuel/oil heat exchanger and associated circuitry is provided to maintain the hot engine oil in heat exchange relationship with the cool engine fuel Where anti-icing of the fuel filter is required means are provided to maintain the fuel temperature entering the filter at or above a minimum level to prevent freezing thereof Fluid circuitry is provided to route hot engine oil through a plurality of heat exchangers disposed within the system to provide for selective cooling of the oil

Official Gazette of the U S Patent Office



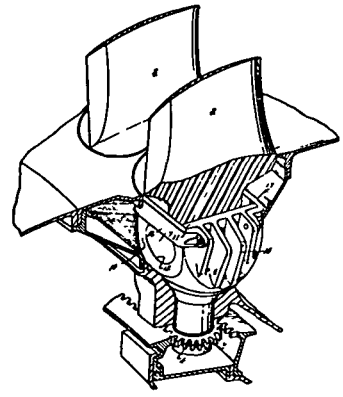
N78-10468* National Aeronautics and Space Administration Lewis Research Center Cleveland, Ohio

IMPACT ABSORBING BLADE MOUNTS FOR VARIABLE PITCH BLADES Patent

Richard Ravenhall (GE Cincinnati), Charles T Salemme (GE Cincinnati), and Arthur P Adamson inventors (to NASA) (GE Cincinnati) Issued 13 Sep 1977 6 p Filed 29 May 1975 Sponsored by NASA

(NASA-Case-LEW-12313-1 US-Patent-4,047 840 US-Patent-Appl-SN-581751 US-Patent-Class-416-135, US-Patent-Class-416-141 US-Patent-Class-416-220R US-Patent-Class-416-248) Avail US Patent Office CSCL 13I

A variable pitch blade and blade mount are reported that are suitable for propellers fans and the like and which have improved impact resistance Composite fan blades and blade mounting arrangements permit the blades to pivot relative to a turbine hub about an axis generally parallel to the centerline of the engine upon impact of a large foreign object such as a bird Centrifugal force recovery becomes the principal energy absorbing mechanism and a blade having improved impact strength is obtained Official Gazette of the U S Patent Office



N78-11398*# National Aeronautics and Space Administration Pasadena Office Calif

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

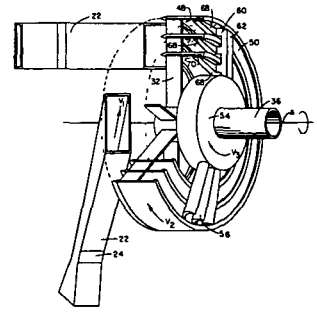
David G Elliott inventor (to NASA) (JPL) Filed 31 Oct 1977 20 p

(Contract NAS7-100)

(NASA-Case-NPO-14130-1 US-Patent-Appl-SN-847278) Avail NTIS HC A02/MF A01 CSCL 13I

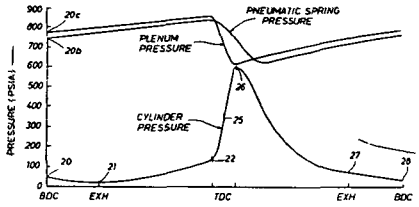
A turbine is described which comprises a plurality of nozzles for delivering streams of a two-phase fluid along linear paths and a phase separator for responsively separating the vapor and liquid phases This phase separator is characterized by concentrically related annuli supported for rotation within the paths and having endless channels for confining the liquid under the influence of centrifugal forces A vapor turbine fan extracts kinetic energy from the vapor and a liquid turbine blade extracts kinetic energy from the liquid Thus the angular momentum of both the liquid phase and the vapor phase of the fluid is converted to torque

NASA



N78-11399*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston Tex
RECIPROCATING ENGINES Patent Application
James W Akkerman inventor (to NASA) Filed 31 Oct 1977 17 p
(NASA-Case-MSC-16239-1 US-Patent-Appl-SN-847276) Avail NTIS HC A02/MF A01 CSCL 20A

The operation of the intake valve of hydrazine powered engines is described The poppet valve uses a pneumatic spring which holds the poppet valve against the piston while the valve is opened and closed To accomplish this a poppet valve is slidably mounted in a pneumatic spring chamber which reaches a pressure approaching the gas supply pressure and during the opening of the valve the spring chamber retains enough pressure to hold the poppet valve onto the piston In addition the bottom of the poppet valve can have a suction cup type configuration to hold the poppet valve on the piston on the down stroke NASA

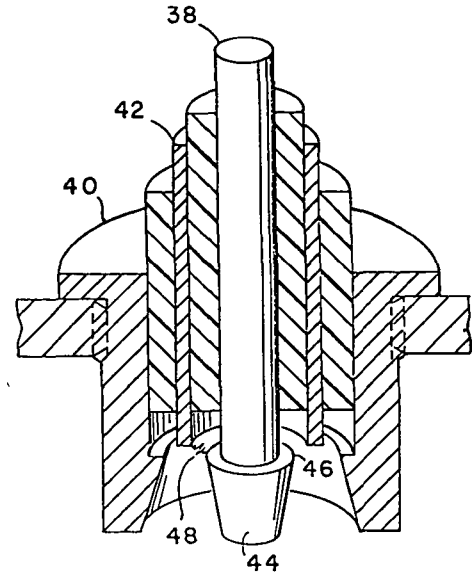


N78-13436* National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio
METHOD OF FORMING METAL HYDRIDE FILMS Patent
Robert Steinberg Donald L Alger and Dale W Cooper inventors (to NASA) Issued 25 Oct 1977 5 p Filed 20 Feb Supersedes N76-18262 (14 - 09 p 1100)
(NASA-Case-LEW-12083-1 US-Patent-4 055,686, US-Patent-Appl-SN-659882, US-Patent-Class-427-124, US-Patent-Class-427-126, US-Patent-Class-427-255, US-Patent-Class-427-248E US-Patent-Class-427-250 US-Patent-Class-250-499 US-Patent-Class-313-61S) Avail US Patent Office CSCL 13H

The substrate to be coated (which may be of metal glass or the like) is cleaned, both chemically and by off-sputtering in a vacuum chamber In an ultra-high vacuum system vapor deposition by a sublimator or vaporizer coats a cooled shroud disposed around the substrate with a thin film of hydride forming metal which getters any contaminant gas molecules A shutter is then opened to allow hydride forming metal to be deposited as a film or coating on the substrate After the hydride forming metal coating is formed deuterium or other hydrogen isotopes are bled into the vacuum system and diffused into the metal film or coating to form a hydride of metal film Higher substrate temperatures and pressures may be used if various parameters are appropriately adjusted
Official Gazette of the U S Patent Office

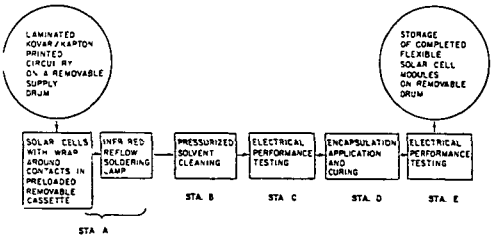
N78-13440*# National Aeronautics and Space Administration Pasadena Office, Calif
PLASMA IGNITER FOR INTERNAL COMBUSTION ENGINE Patent Application
Dennis J Fitzgerald (JPL) and Robert R Breshears inventors (to NASA) (JPL) Filed 1 Apr 1976 13 p
(Contract NAS7-100)
(NASA-Case-NPO-13828-1 US-Patent-Appl-SN-672636) Avail NTIS HC A02/MF A01 CSCL 20A

An igniter for the fuel air mixture used in the cylinders of an internal combustion engine uses a conventional spark to initiate the discharge of a large amount of energy stored in the capacitor A high current discharge of the energy in the capacitor switched on by a spark discharge produces a plasma and a magnetic field The resultant combined electromagnetic current field forces the plasma deep into the combustion chamber thus providing an improved ignition of the fuel-air mixture in the chamber NASA



N78-13441*# National Aeronautics and Space Administration Pasadena Office, Calif
MACHINE FOR FORMING A SOLAR ARRAY STRIP Patent Application
Robert L Mueller (JPL), Robert Y Yasui (JPL), Fred J Cairo (JPL) Jerry K Person (JPL), Ernest N Costogue (JPL), Roy G Downing (JPL), and Orwin Middleton inventors (to NASA) (JPL) Filed 4 Nov 1977 27 p
(Contract NAS7-100)
(NASA-Case-NPO-13652-2 US-Patent-Appl-SN-848794) Avail NTIS HC A03/MF A01 CSCL 13H

A machine is described for attaching solar cells to a flexible substrate having printed circuitry The strip is fed through a station where solar cells come into contact with solder pads for the printed circuitry and are simultaneously heated by an infrared lamp The strip then passes to various stations where flux and solder residue are removed, the electrical performance of the soldered cells is determined an encapsulating resin is deposited on the cells and the encapsulated solar cells are examined for electrical performance At the final station the resulting array is wound on a take-up drum NASA



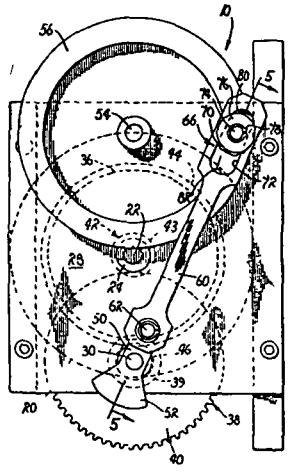
N78-16389* National Aeronautics and Space Administration Pasadena Office, Calif

MOTION RESTRAINING DEVICE Patent

Allen G Ford inventor (to NASA) (JPL) Issued 13 Dec 1977 8 p Filed 30 Apr 1975 Supersedes N75-22748 (13 - 14, p 1659) Sponsored by NASA
(NASA-Case-NPO-13619-1 US-Patent-4 062 245, US-Patent-Appl-SN-572990 US-Patent-Class-74-81, US-Patent-Class-74-83 US-Patent-Class-185-38) Avail US Patent Office CSCL 20K

A motion-restraining device for dissipating at a controlled rate the force of a moving body is discussed The device is characterized by a drive shaft adapted to be driven in rotation by a moving body connected to a tape wound about a reel mounted on the drive shaft, and an elongated pitman link having one end pivotally connected to the crankshaft and the opposite end thereof connected with the mass through an energy dissipating linkage A shuttle is disposed within a slot and guided by rectilinear motion between a pair of spaced impact surfaces Reaction forces applied at impact of the shuttle with the impact surfaces include oppositely projected force components angularly related to the direction of the applied impact forces

Official Gazette of the U S Patent Office



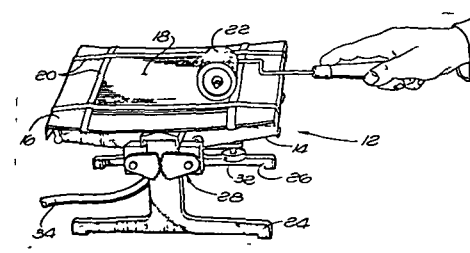
N78-17383* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex

ADJUSTABLE SECURING BASE Patent

Paul P Zebus (Rockwell International, Downey, Calif) and Poley N Packer, inventors (to NASA) (Rockwell International, Downey, calif) Issued 3 Jan 1978 5 p Filed 7 Sep 1976 Supersedes N76-31529 (14 - 22, p 2872) Sponsored by NASA
(NASA-Case-MSC-19666-1, US-Patent-4,066,039, US-Patent-Appl-SN-721150, US-Patent-Class-118-500, US-Patent-Class-118-50 US-Patent-Class-51-235 US-Patent-Class-248-36-3, US-Patent-Class-269-21, US-Patent-Class-279-3) Avail US Patent Office CSCL 13I

An adjustable securing base had a surface radius of curvature which was adjusted to support an adjacent part on the base surface The securing base comprised of a flexible thin plate with an adjustment mechanism connected on opposite edges of the base for adjusting the plate curvature An opening in the plate was coupled to a vacuum device for securing the part adjacent to the plate surface

Official Gazette of the U S Patent Office

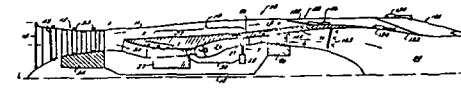


N78-17384* National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

VARIABLE CYCLE GAS TURBINE ENGINES Patent

James Edward Johnson (GE, Cincinnati) and Tom Foster, inventors (to NASA) (GE, Cincinnati) Issued 27 Dec 1977 10 p Filed 2 Jun 1975 Sponsored by NASA
(NASA-Case-LEW-12916-1, US-Patent-4,064,692, US-Patent-Appl-SN-583056, US-Patent-Class-60-261, US-Patent-Class-60-262, US-Patent-Class-60-271) Avail US Patent Office CSCL 21E

A technique, method, and apparatus were designed for varying the bypass ratio and modulating the flow of a gas turbine engine in order to achieve improved mixed mission performance Embodiments include gas flow control system for management of core and bypass stream pressure comprising diverter valve means downstream of the core engine to selectively mix or separate the core and bypass exhaust streams The flow control system may also include variable geometry means for maintaining the engine inlet airflow at a matched design level at all flight velocities Earth preferred embodiment thus may be converted from a high specific thrust mixed flow cycle at supersonic velocities to a lower specific thrust separated flow turbofan system at subsonic velocities with a high degree of flow variability in each mode of operation Official Gazette of the U S Patent Office



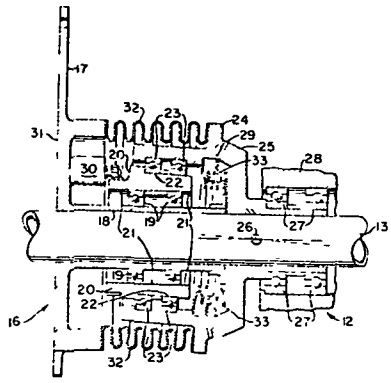
N78-17385* National Aeronautics and Space Administration Pasadena Office, Calif

WABBLE GEAR DRIVE MECHANISM Patent

Francis J Winiarski, inventor (to NASA) (TRW Inc, Redondo Beach, Calif) Issued 28 Feb 1967 5 p Filed 24 Apr 1964 Sponsored by NASA
(NASA-Case-WOO-00625, US-Patent-3,306,134, US-Patent-Appl-SN-362278, US-Patent-Class-74-800) Avail US Patent Office CSCL 13I

The wabble gear principle was applied in the design of a driving mechanism for controlling spacecraft solar panels The moving elements, other than the output gear are contained within a hermetically sealed package to prevent escape of lubricants and ingestion of contaminant particles The driving gear contains one more tooth than the output gear on a concave, conical pitch surface of slightly larger apex angle The two gears mesh face to face such that engagement takes place at one point along the circumference The driving gear is not permitted to rotate by virtue of its attachment through the bellows which permits flexure in the pitch and yaw position, but not in roll As

the bearing carrier rotates, the inclined mounting of the bearing causes the driving gear to perform a wabbling irrotational motion This wabbling motion causes the contact point between the output gear and the driving gear to traverse around the circumference of the gears once per revolution of the bearing carrier A R H



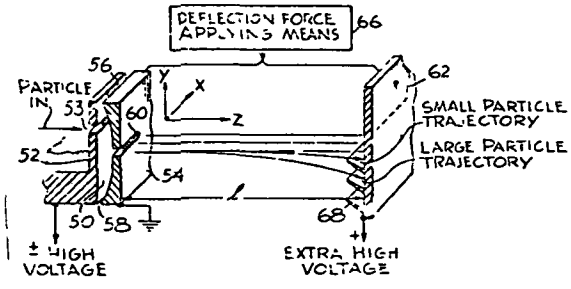
N78-17388* National Aeronautics and Space Administration Pasadena Office, Calif

APPARATUS FOR HANDLING MICRON SIZE RANGE PARTICULATE MATERIAL Patent

Joseph F Friichtenicht (TRW, Inc , Redondo Beach, Calif) and Neal L Roy, inventors (to NASA) (TRW, Inc Redondo Beach, Calif) Issued 4 Jun 1968 6 p Filed 6 May 1964 Sponsored by NASA

(NASA-Case-NPO-10151, US-Patent-3 387 218, US-Patent-Appl-SN-365244, US-Patent-Class-328-233) Avail US Patent Office CSCL 13I

An apparatus for handling transporting, or size classifying comminuted material was described in detail Electrostatic acceleration techniques for classifying particles as to size in the particle range from 0 1 to about 100 microns diameter were employed Official Gazette of the U S Patent Office



N78-17391*# National Aeronautics and Space Administration Pasadena Office, Calif

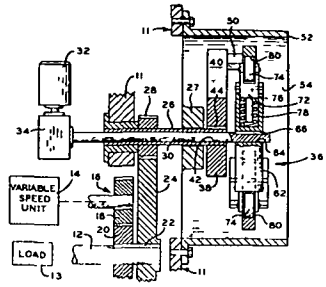
A SPEED CONTROL DEVICE FOR A HEAVY DUTY SHAFT Patent Application

Allen G Ford, inventor (to NASA) (JPL) Filed 13 Dec 1977 16 p

(Contract NAS7-100)

(NASA-Case-NPO-14170 US-Patent-Appl-SN-860404) Avail NTIS HC A02/MF A01 CSCL 13I

A device was provided through which the angular velocity of a heavy duty shaft was mechanically compared to that of a reference speed shaft, and detected error in the velocity of the heavy duty shaft was eliminated NASA



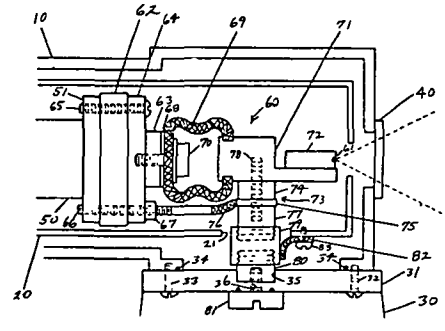
N78-19515*# *National Aeronautics and Space Administration* Goddard Space Flight Center, Greenbelt, Md

SHOCK ISOLATOR FOR OPERATING A DIODE LASER AND CLOSED-CYCLE REFRIGERATOR Patent Application

Donald E Jennings, inventor (to NASA) (NAS-NRC) Filed 24 Feb 1978 14 p Sponsored by NASA

(NASA-Case-GSC-12297-1, US-Patent-Appl-SN-880838) Avail NTIS HC A02/MF A01 CSCL 13E

A diode laser mounted within a helium refrigerator is mounted using a braided copper ground strap which provides good impact shock isolation from the refrigerator cold-tip while also providing a good thermal link to the cold-tip The diode mount also contains a rigid stand-off assembly consisting of alternate sections of nylon and copper which serve as cold stations to improve thermal isolation from the vacuum housing mounting structure Included in the mount is a Pb-In alloy wafer inserted between the cold-tip and the diode to damp temperature fluctuations occurring at the cold-tip NASA



38 QUALITY ASSURANCE AND RELIABILITY

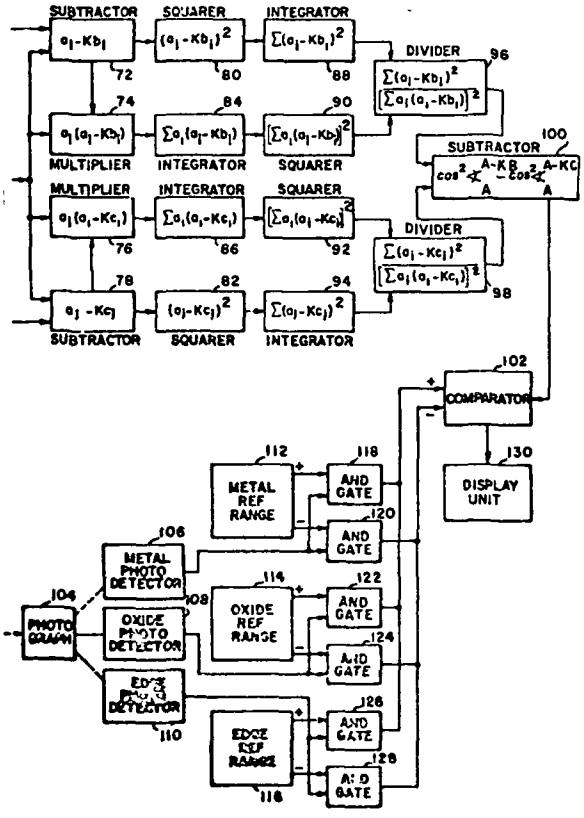
Includes product sampling procedures and techniques and quality control

N78-17395* National Aeronautics and Space Administration Pasadena Office Calif

CROSS CORRELATION ANOMALY DETECTION SYSTEM Patent

Ernest Z Micka, inventor (to NASA) (JPL) Issued 23 Sep 1975 13 p Filed 27 Feb 1973 Sponsored by NASA (NASA-Case-NPO-13283 US-Patent-3,908 118, US-Patent-Appl-SN-401225, US-Patent-Class-235-181, US-Patent-Class-235-151 3, US-Patent-Class-235-156, US-Patent-Class-250-572 US-Patent-Class-356-237) Avail US Patent Office CSCL 14D

This invention provides a method for automatically inspecting the surface of an object, such as an integrated circuit chip, whereby the data obtained by the light reflected from the surface caused by a scanning light beam, is automatically compared with data representing acceptable values for each unique surface A signal output is provided indicative of acceptance or rejection of the chip Acceptance is based on predetermined statistical confidence intervals calculated from known good regions of the object being tested or their representative values The method can utilize a known good chip, a photographic mask from which the I C was fabricated or a computer stored replica of each pattern being tested Official Gazette of the U S Patent Office

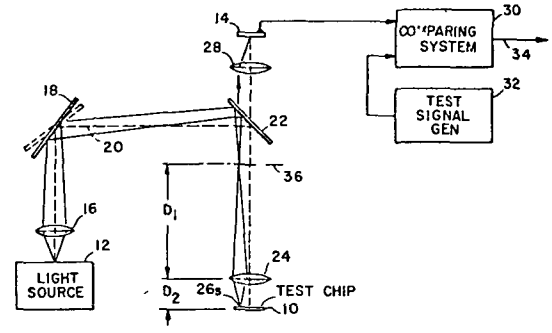


N78-17396* National Aeronautics and Space Administration *Pasadena Office, Calif*

AUTOMATIC VISUAL INSPECTION SYSTEM FOR MICRO-ELECTRONICS Patent

Ernest Z Micka, inventor (to NASA) (JPL) Issued 30 Sep 1975 13 p Filed 27 Sep 1973 Sponsored by NASA (NASA-Case-NPO-13282, US-Patent-3,909,602, US-Patent-Appl-SN-401224, US-Patent-Class-235-151 3, US-Patent-Class-235-156, US-Patent-Class-250-563, US-Patent-Class-250-572, US-Patent-Class-356-165, US-Patent-Class-356-237) Avail US Patent Office CSCL 14D

A system for automatically inspecting an integrated circuit was developed A device for shining a scanning narrow light beam at an integrated circuit to be inspected and another light beam at an accepted integrated circuit was included A pair of photodetectors that receive light reflected from these integrated circuits and a comparing system compares the outputs of the photodetectors Official Gazette of the U S Patent Office



39 STRUCTURAL MECHANICS

Includes structural element design and weight analysis fatigue and thermal stress

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

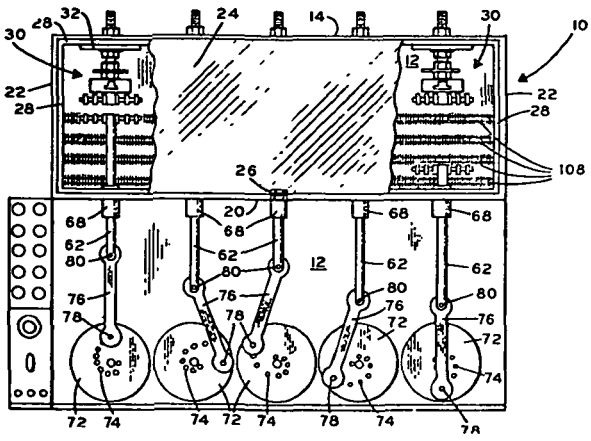
N78-10493* National Aeronautics and Space Administration Pasadena Office, Calif

MACHINE FOR USE IN MONITORING FATIGUE LIFE FOR A PLURALITY OF ELASTOMERIC SPECIMENS Patent

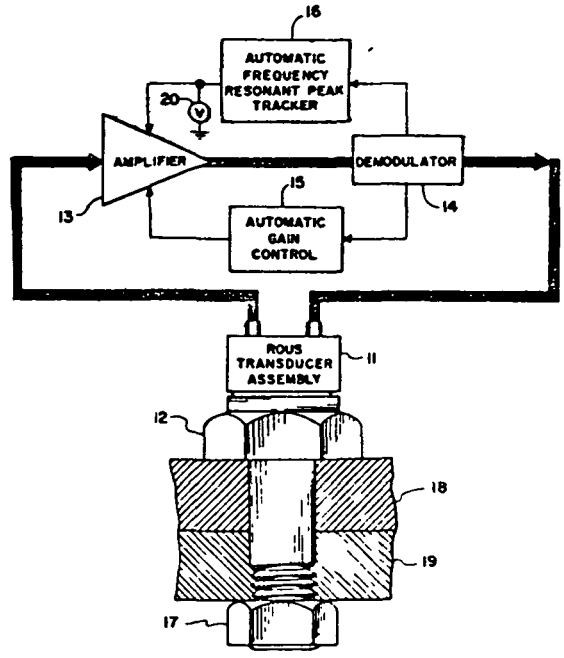
George E Fitzer, inventor (to NASA) (JPL) Issued 21 Jun 1977 8 p Filed 29 Jan 1976 Supersedes N76-17427 (14 - 08 p 0985) Sponsored by NASA (NASA-Case-NPO-13731-1, US-Patent-4,030,348 US-Patent-Appl-SN-653682, US-Patent-Class-73-91 US-Patent-Class-73-15 6) Avail US Patent Office CSCL 20K

An improved machine is described for use in determining the fatigue life for elastomeric specimens The machine is characterized by a plurality of juxtaposed test stations, specimen support means located at each of the test stations for supporting a plurality of specimens of elastomeric material, and means for subjecting the specimens at each of said stations to sinusoidal strain at a strain rate unique with respect to the strain rate at

which the specimens at each of the other stations is subjected to sinusoidal strain Official Gazette of the U S Patent Office



the frequency of the peak and is a measure of the frequency shift Official Gazette of the U S Patent Office



N78-15512* National Aeronautics and Space Administration Langley Research Center, Langley Station Va

CW ULTRASONIC BOLT TENSIONING MONITOR Patent

Joseph S Heyman inventor (to NASA) Issued 13 Dec 1977 12 p Filed 23 Dec 1976 Supersedes N77-15236 (15 - 06 p 0735)

(NASA-Case-LAR-12016-1 US-Patent-4 062 227 US-Patent-Appl-SN-754066 US-Patent-Class-73-630 US-Patent-Class-73-579 US-Patent-Class-73-88F) Avail US Patent Office CSCL 20K

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

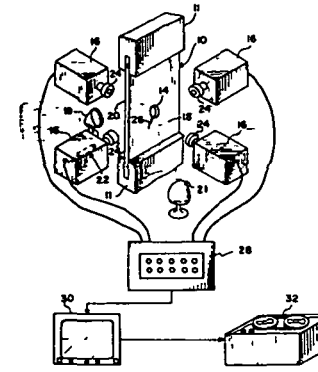
N78-16387* National Aeronautics and Space Administration Langley Research Center Langley Station Va

TV FATIGUE CRACK MONITORING SYSTEM Patent

Reginald J Exton inventor (to NASA) Issued 13 Dec 1977 5 p Filed 20 Jul 1976 Supersedes N76-28530 (14 - 19 p 2462)

(NASA-Case-LAR-11490-1 US-Patent-4 063 282 US-Patent-Appl-SN-707125 US-Patent-Class-358-106) Avail US Patent Office CSCL 20K

An apparatus is disclosed for monitoring the development and growth of fatigue cracks in a test specimen subjected to a pulsating tensile load A plurality of television cameras photograph a test specimen which is illuminated at the point of maximum tensile stress The television cameras have a modified vidicon tube which has an increased persistence time thereby eliminating flicker in the displayed images Author



43 EARTH RESOURCES

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

For instrumentation see *35 Instrumentation and Photography*

N78-10529* National Aeronautics and Space Administration Goddard Inst for Space Studies New York

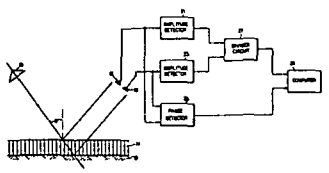
REMOTE SENSING OF VEGETATION AND SOIL USING MICROWAVE ELLIPSOMETRY Patent

Siegfried O Auer (NAS-NRC) and John B Schutt, inventors (to NASA) Issued 4 Oct 1977 7 p Filed 15 Apr 1976 Supersedes N76-23671 (14 - 14, p 1814)

(NASA-Case-GSC-11976-1 US-Patent-4 052,666 US-Patent-Appl-SN-677352 US-Patent-Class-324-58 5B) Avail US Patent Office CSCL 08F

A method is described of determining vegetation height and water content of vegetation from the intensity and state of elliptical polarization of a reflected train of microwaves The method comprises the steps of reflecting a circularly polarized train of microwaves from vegetation at a predetermined angle of incidence and detecting the reflected train of microwaves The ratio of the intensities of the electric field vector components is determined, the phase difference of the components is measured and the refractive index and thickness of the layer of vegetation are computed from a formula The refractive index is given essentially by the water content of the vegetation

Official Gazette of the U S Patent Office



N78-14452* National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

IN-SITU LASER RETORTING OF OIL SHALE Patent

Harvey S Bloomfield inventor (to NASA) Issued 6 Dec 1977 5 p Filed 28 Jan 1977 Supersedes N77-18429 (15 - 09, p 1176)

(NASA-Case-LEW-12217-1 US-Patent-4,061 190 US-Patent-Appl-SN-762753 US-Patent-Class-166-259 US-Patent-Class-166-248) Avail US Patent Office CSCL 08I

Oil shale formations are retorted in situ and gaseous hydrocarbon products are recovered by drilling two or more wells into an oil shale formation underneath the surface of the ground A high energy laser beam is directed into the well and fractures the region of the shale formation A compressed gas is forced into the well that supports combustion in the flame front ignited by the laser beam, thereby retorting the oil shale Gaseous hydrocarbon products which permeate through the fractured region are recovered from one of the wells that were not exposed to the laser system

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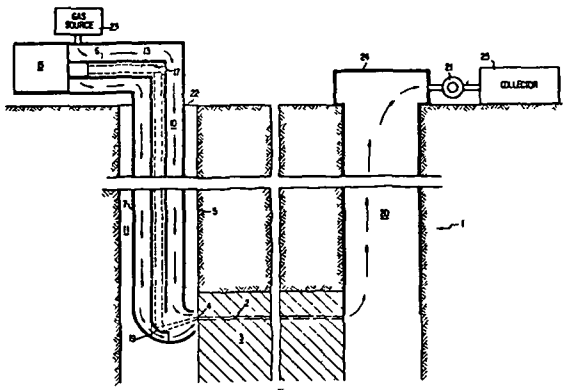


44 ENERGY PRODUCTION AND CONVERSION

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

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

N78-10554* National Aeronautics and Space Administration Pasadena Office, Calif

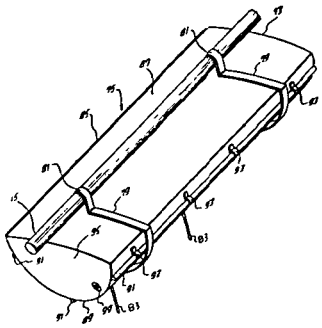
PORTABLE LINEAR-FOCUSED SOLAR THERMAL ENERGY COLLECTING SYSTEM Patent

Charles G Miller (JPL) and Jens G Pohl inventors (to NASA) (JPL) Issued 4 Oct 1977 12 p Filed 28 Apr 1976 Supersedes N76-26690 (14 - 17 p 2218) Sponsored by NASA

(NASA-Case-NPO-13734-1 US-Patent-4 051,834, US-Patent-Appl-SN-680939, US-Patent-Class-126-271 US-Patent-Class-237-1A US-Patent-Class-350-293 US-Patent-Class-350-299) Avail US Patent Office CSCL 10A

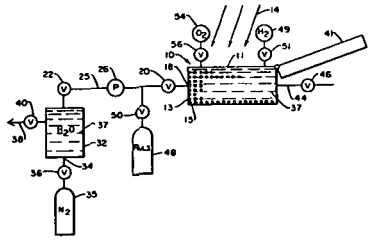
A solar heat collection system is provided by utilizing a line-focusing device that is effectively a cylindrically curved concentrator within a protected environment formed by a transparent inflatable casing A target, such as a fluid or gas carrying conduit is positioned within or near the casing containing the concentrator, at the line focus of the concentrator The casing can be inflated at the site of use by a low pressure air supply to form a unitary light weight structure The collector including casing concentrator and target, is readily transportable and can be used either at ground level or on rooftops The inflatable concentrator can be replaced with a rigid metal or other concentrator while maintaining the novel advantages of the whole

solar heat collection system
Official Gazette of the U S Patent Office



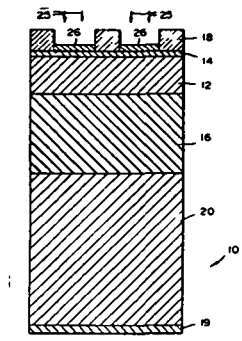
N78-11500*# National Aeronautics and Space Administration Pasadena Office Calif
IMPROVED SOLAR PHOTOLYSIS OF WATER Patent Application
Porter R Ryason inventor (to NASA) (JPL) Filed 30 Sep 1977 18 p
(Contract NAS7-100)
(NASA-Case-NPO-14126-1 US-Patent-Appl-SN-838336) Avail NTIS HC A02/MF A01 CSCL 10A

A cyclic process for the solar photolysis of water was developed The process includes a first stage in which water is reduced in the presence of a Eu(+2) photo-oxidizable reagent producing hydrogen and spent oxidized Eu(+3) reagent The spent reagent is reduced by means of a transition metal liquid 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 photo-oxidation 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 NASA



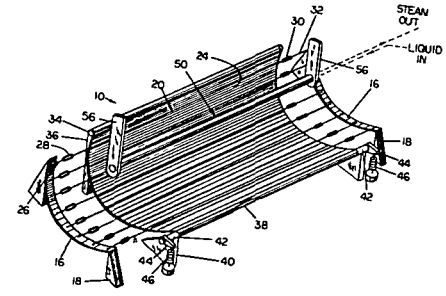
N78-13526* National Aeronautics and Space Administration Pasadena Office Calif
HIGH VOLTAGE, HIGH CURRENT SCHOTTKY BARRIER SOLAR CELL Patent
Richard J Stirn, inventor (to NASA) (JPL) Issued 11 Oct 1977 5 p Filed 5 Aug 1974 Supersedes N74-30448 (12 - 20 p 2374) Sponsored by NASA
(NASA-Case-NPO-13482-1, US-Patent-4 053,918
US-Patent-Appl-SN-495021 US-Patent-Class-357-30,
US-Patent-Class-357-15 US-Patent-Class-357-16
US-Patent-Class-136-89-SJ) Avail US Patent Office CSCL 10A

A Schottky barrier solar cell was described, which consists of a layer of wide band gap semiconductor material on which a very thin film of semitransparent metal was deposited to form a Schottky barrier The layer of the wide band gap semiconductor material is on top of a layer of narrower band gap semiconductor material to which one of the cell s contacts may be attached directly or through a substrate The cell's other contact is a grid structure which is deposited on the thin metal film
Official Gazette of the U S Patent Office



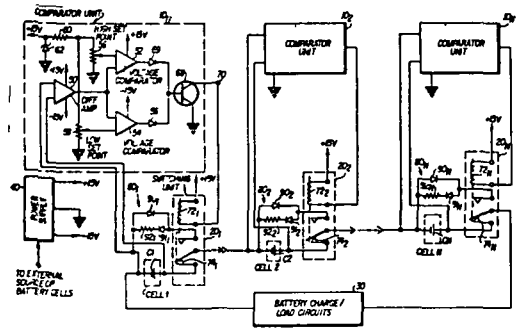
N78-13556*# National Aeronautics and Space Administration Marshall Space Flight Center Huntsville Ala
AN IMPROVED SOLAR CONCENTRATOR Patent Application
John G Simpson, inventor (to NASA) Filed 30 Nov 1977 15 p
(NASA-Case-MFS-23727-1 US-Patent-Appl-SN-856465) Avail NTIS HC A02/MF A01 CSCL 10A

A solar energy conversion device is described The device is embodied in an improved solar concentrator characterized by elongated supporting members arranged in substantial horizontal parallelism with the axes thereof intersecting a common curve and a tensioned sheet of flexible reflective material disposed in engaging relation with the supporting members for imparting thereto a catenary configuration The supporting members comprise tensioned wires about which a flexible sheet is drawn The supporting members comprise rods inserted into tubular receptacles transversely related to a flexible sheet whereby the sheet is tensioned by the weight of the rods The instant invention provides a simple economic and efficient solar energy concentrator particularly suited for use with systems provided for converting solar energy to heat in dwellings and similar structures NASA



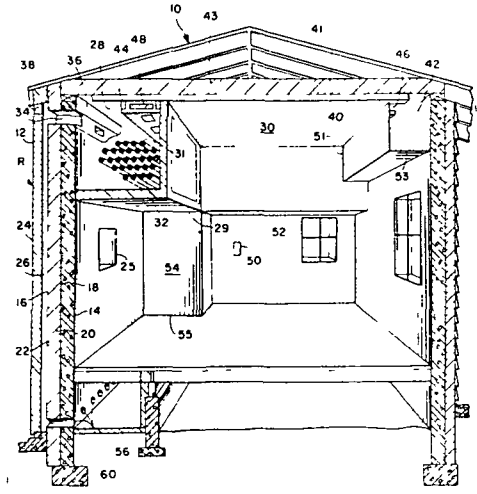
N78-14625* National Aeronautics and Space Administration Lewis Research Center Cleveland, Ohio
MULTI-CELL BATTERY PROTECTION SYSTEM Patent
Ralph D Thomas and William J Nagle, inventors (to NASA) Issued 6 Dec 1977 5 p Filed 19 May 1976 Supersedes N76-23713 (14 - 14 p 1820)
(NASA-Case-LEW-12039-1 US-Patent-4 061 955
US-Patent-Appl-SN-687822 US-Patent-Class-320-6,
US-Patent-Class-320-15 US-Patent-Class-320-18
US-Patent-Class-320-40) Avail US Patent Office CSCL 10A

A multi-cell battery protection system is described wherein each cell has its own individual protective circuit The protective circuits consist of a solid state comparator unit and a high current switching device such as a relay The comparator units each continuously monitor the associated cell and when the cell voltage either exceeds a predetermined high level or falls below a predetermined low level the relay is actuated whereby a bypass circuit is completed across the cell thereby effectively removing the cell from the series of cells
Official Gazette of the U S Patent Office



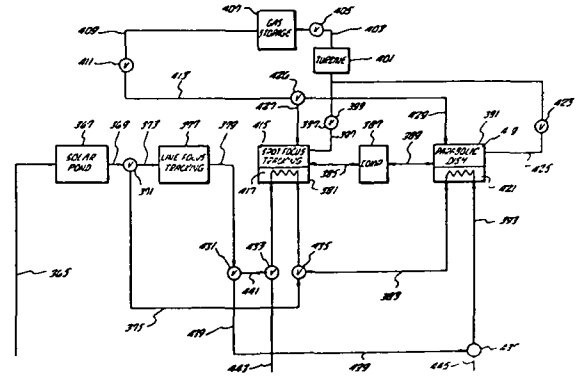
N78-15560* National Aeronautics and Space Administration Langley Research Center Langley Station Va
SOLAR HEATING SYSTEM Patent
Ronald N Jensen inventor (to NASA) Issued 24 Aug 1976 7 p Filed 24 aug 1976 Supersedes N76-32649 (14 - 23 p 3024)
(NASA-Case-LAR-12009-1 US-Patent-4,062 347
US-Patent-Appl-SN-717320 US-Patent-Class-126-270,
US-Patent-Class-126-400 US-Patent-Class-237-1A) Avail US Patent Office CSCL 10A

A system is disclosed for using solar energy to heat the interior of a structure The system utilizes a low cost solar collector to heat a recirculating air mass which then flows through a series of interconnected ducts and passageways without the use of exterior fans or blowers Heat is transferred from the air mass to the structure s interior and the air mass is then reheated
Official Gazette of the U S Patent Office



N78-17460* National Aeronautics and Space Administration Pasadena Office, Calif
LOW COST SOLAR ENERGY COLLECTION SYSTEM Patent
Charles G Miller (JPL) and James B Stephans, inventors (to NASA) (JPL) Issued 27 Dec 1977 26 p Filed 24 Jul 1975 Supersedes N75-28519 (13 - 19, p 2406) Sponsored by NASA
(NASA-Case-NPO-13579-1 US-Patent-4,065 053,
US-Patent-Appl-SN-598969, US-Patent-Class-237-1A
US-Patent-Class-60-641 US-Patent-Class-62-4
US-Patent-Class-126-271 US-Patent-Class-126-263,
US-Patent-Class-165-2) Avail US Patent Office CSCL 10A

A fixed linear ground-based primary reflector having an extended curved sawtooth contoured surface covered with a metallized polymeric reflecting material reflected solar energy to a movably supported collector that was kept at the concentrated line focus of the reflector primary Efficient utilization leading to high temperatures from the reflected solar energy was obtained by cylindrical shaped secondary reflectors that directed off-angle energy to the absorber pipe
Official Gazette of the U S Patent Office



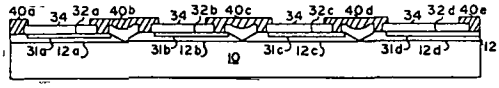
N78-17468*# National Aeronautics and Space Administration Marshall Space Flight Center Huntsville Ala

METHOD OF CONSTRUCTION OF A MULTI-CELL SOLAR ARRAY Patent Application

Donald E Routh Ben R Hollis and William R Feltner inventors (to NASA) Filed 23 Dec 1977 9 p

(NASA-Case-MFS-23540-1 US-Patent-Appl-SN-863773) Avail NTIS HC A02/MF A01 CSCL 10A

A method of construction of photovoltaic devices particularly of multi-cell photovoltaic devices used to form solar cell arrays was delineated The first step is to effect in a top surface region of substrate a semiconductive layer by the diffusion of an impurity into the top surface region Next by photolithography and etching the base region is divided into a plurality of base regions and as separated upper active surface regions are created in the top surface region of the base regions by diffusion of the opposite polarity type to that employed in the creation of base regions Metal contacts are then formed which interconnect between the upper active region of one cell and the lower base region of the adjoining cell In this manner the cells are connected in series to make their voltages additive NASA



N78-19599* National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

SELECTIVE COATING FOR SOLAR PANELS Patent

Glen E McDonald inventor (to NASA) Issued 25 Oct 1977 6 p Filed 22 Dec 1975 Supersedes N76-15603 (14 - 06 p 0741)

(NASA-Case-LEW-12159-1 US-Patent-4 055,707 US-Patent-Appl-SN-643041, US-Patent-Class-428-652, US-Patent-Class-126-270 US-Patent-Class-427-160 US-Patent-Class-428-667, US-Patent-Class-428-679) Avail US Patent Office CSCL 10A

The energy absorbing properties of solar heating panels are improved by depositing a black chrome coating of controlled thickness on a specially prepared surface of a metal substrate The surface is prepared by depositing a dull nickel on the substrate, and the black chrome is plated on this low emittance surface to a thickness between 0 5 micron and 2 5 microns

Official Gazette of the U S Patent Office

N78-19608*# National Aeronautics and Space Administration Pasadena Office, Calif

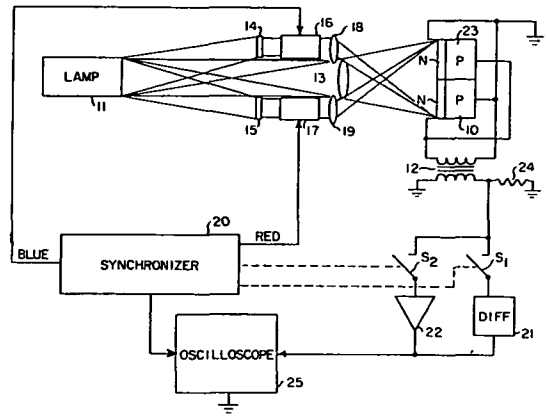
METHOD AND APPARATUS FOR MEASURING MINORITY CARRIER LIFETIMES AND BULK DIFFUSION LENGTH IN P-N JUNCTION SOLAR CELLS Patent Application

Oldwig VonRoos, inventor (to NASA) (JPL) Filed 16 Dec 1977 20 p

(Contract NAS7-100)

(NASA-Case-NPO-14100-1 US-Patent-Appl-SN-861391) Avail NTIS HC A02/MF A01 CSCL 10A

Carrier lifetimes and bulk diffusion length are qualitatively measured as a means for qualification of a P-N junction photovoltaic solar cell by alternately applying high frequency (blue) monochromatic light pulses and low frequency (red) monochromatic light pulses to the cell while it is irradiated by light from a solar simulator, and synchronously displaying the derivative of the output voltage of the cell on an oscilloscope This output voltage is a measure of the lifetimes of the minority carriers (holes) in the diffused N layer and majority carriers (electrons)



N78-19609*# National Aeronautics and Space Administration Pasadena Office, Calif

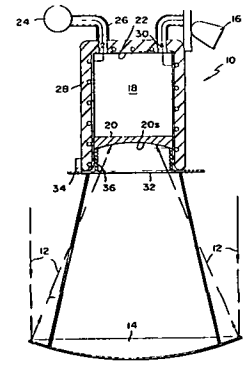
MICROWAVE POWER CONVERTER Patent Application

Richard M Dickinson inventor (to NASA) (JPL) Filed 8 Dec 1977 12 p

(Contract NAS7-100)

(NASA-Case-NPO-14068-1, US-Patent-Appl-SN-858769) Avail NTIS HC A02/MF A01 CSCL 10A

A simple orbiting space station that converts sunlight into microwave power for transmission to earth was devised The basic concept is to use a large mirror to concentrate sunlight onto a piston so that the radiation pressure of the sunlight moves the piston to compress a microwave cavity Microwaves resonating in the cavity undergo an increase in frequency and therefore in power as the cavity is compressed When the piston is close to the end wall, a switch is opened to allow most of the microwave power to pass to an antenna which radiates it to the earth A rotary wheel with blades are turned by concentrated sunlight from a mirror As the blade enters the space between a pair of parallel plates it begins compressing the space to increase the microwave energy, some of which passes out through a switch When the blade reaches position the remaining microwave energy leaks under that blade but is stopped by the next blade NASA



46 GEOPHYSICS

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

For space radiation see *93 Space Radiation*

N78-17529*# National Aeronautics and Space Administration Pasadena Office Calif

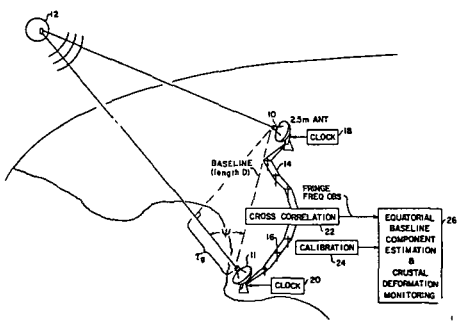
SYSTEM FOR NEAR REAL-TIME CRUSTAL DEFORMATION MONITORING Patent Application

Peter F MacDoran inventor (to NASA) (JPL) Filed 21 Dec 1977 21 p

(Contract NAS7-100)

(NASA-Case-NPO-14124-1 US-Patent-Appl-SN-863024) Avail NTIS HC A02/MF A01 CSCL 08G

Near real-time crustal deformation monitoring can be achieved by independent stations which receive S-band radio signals from an Apollo Lunar Surface Experiment Package (ALSEP) The received signals are time tagged by a digital code or L-band signals from the Global Positioning System (GPS) using synchronized atomic clocks 18 and 20 at the two stations and then transmitted to a cross-correlation station 22 through telephone lines 14 and 16 The time tags permit the phone line delays to be determined in order for any difference in the phone line delays to be compensated before cross correlating the signals The fringe frequency observation from ALSEP or delay from GPS are obtained by cross correlation and used to estimate base lines for crustal deformation monitoring The novelty of the invention resides in the use of an artificial radio signal source of narrow bandwidth for transmission over conventional telephone lines NASA



51 LIFE SCIENCES (GENERAL)

Includes genetics

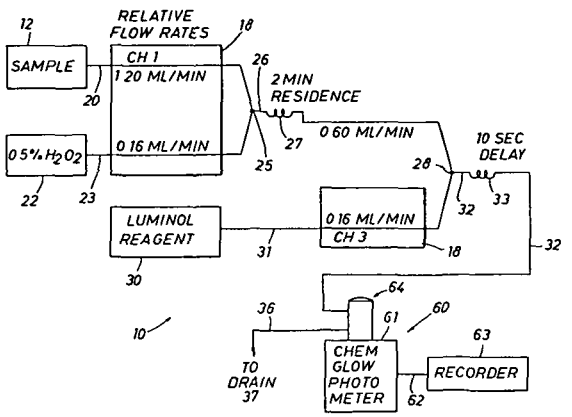
N78-18674*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston Tex

METHOD AND APPARATUS FOR ELIMINATING LUMINOL INTERFERENCE MATERIAL Patent Application

Eldon Jeffers (Boeing Aerospace Co , Houston, Tex) and R R Thomas inventors (to NASA) (Boeing Aerospace Co , Houston, Tex) Filed 9 Feb 1978 27 p Sponsored by NASA

(NASA-Case-MSC-16260-1 US-Patent-Appl-SN-876440) Avail NTIS HC A02/MF A01 CSCL 06M

A method was developed for automatically and rapidly making determinations of the total number of bacteria alive and dead, present in a fluid sample by using the iron porphyrin assay method The method provides for eliminating luminescent interference caused by the reaction of luminol with common inorganic interfering agents such as metallic ions and organic interfering agents such as extracellular porphyrin The reliability of the iron porphyrin is thereby increased by inactivating soluble iron porphyrins in the sample which are unrelated to the bacteria in the sample, but which would luminoscently react with luminol to interfere with the assay NASA



52 AEROSPACE MEDICINE

Includes physiological factors, biological effects of radiation and weightlessness

N78-10686* National Aeronautics and Space Administration Ames Research Center Moffett Field Calif

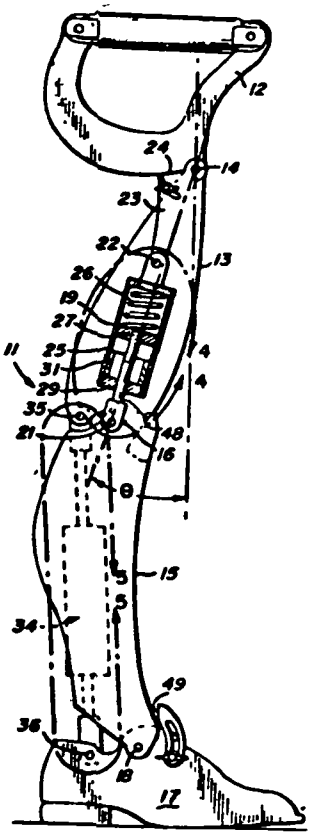
MECHANICAL ENERGY STORAGE DEVICE FOR HIP DISARTICULATION Patent

Wilbur C Vallotton, inventor (to NASA) Issued 4 Oct 1977 7 p Filed 30 Jun 1976 Supersedes N76-26871 (14 - 17 p 2241)

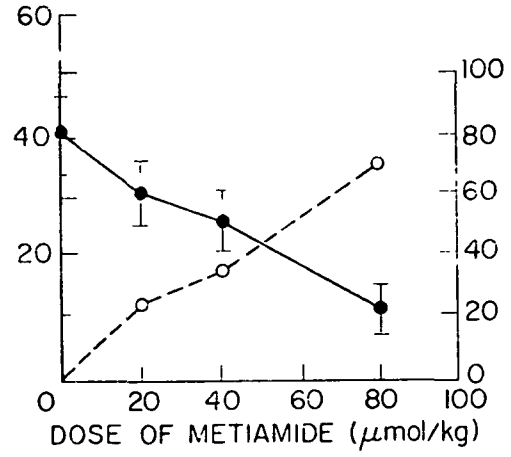
(NASA-Case-ARC-10916-1, US-Patent-4 051 558 US-Patent-Appl-SN-701448 US-Patent-Class-3-1 2 US-Patent-Class-3-15 US-Patent-Class-3-29) Avail US Patent Office CSCL 06B

An artificial leg including a trunk socket a thigh section hingedly coupled to the trunk socket a leg section hingedly coupled to the thigh section and a foot section hingedly coupled to the leg section is outlined A mechanical energy storage device is operatively associated with the artificial leg for storage and release of energy during the normal walking stride of the user Energy is stored in the mechanical energy storage device during a weight-bearing phase of the walking stride when the user s weight is on the artificial leg Energy is released during a phase of the normal walking stride when the user s weight is removed from the artificial leg The stored energy is released from the energy storage device to pivot the thigh section forwardly about

the hinged coupling to the trunk socket
Official Gazette of the U S Patent Office



distress caused by indomethacin Usable antagonists include pyrilamine promethazine metiamide and cimetidine NASA

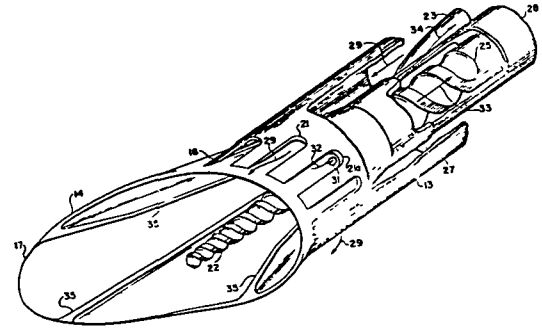


N78-14773* National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio
TISSUE MACERATING INSTRUMENT Patent
Edward F Baehr and James E Burnett inventors (to NASA) Issued 6 Dec 1977 4 p Filed 15 Apr 1976 Supersedes N76-23837 (14 - 14 p 1836)
(NASA-Case-LEW-12668-1 US-Patent-4 061 146 US-Patent-Appl-SN-677353 US-Patent-Class-128-305) Avail US Patent Office CSCL 06B

A surgical tissue macerating and removal tool is described which has a rotating rod with a cutting member at one end and which is disposed in a tube which is then contained in an extension of the tool handle A frusto-conical member extends into the extension at the cutter member end of the rotating rod with its small end engaging the tube The portion of the frusto-conical member outside of the extension forms a tissue engaging member and may be cut off at an angle to the axis of the rod to form a tissue engaging edge Apertures are provided in the extension adjacent the frusto-concial member so that treatment fluid supplied in the annular space between the tube and the extension may flow to the operative site An aperture is provided in the frustoconical member between the extension and the tube so that fluid may also flow into the tube where it mixes with macerated tissue being directed through an aperture in the tube to a passageway which may have suction applied to help remove macerated material
Official Gazette of the U S Patent Office

N78-11692*# 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 10 Nov 1977 18 p
(NASA-Case-ARC-11118-1 US-Patent-Appl-SN-850504) Avail NTIS HC A02/MF A01 CSCL 06E

An anti-inflammatory and analgesic composition is disclosed The agent contains indomethacin and an H1 or an H2 histamine receptor antagonist in an amount sufficient to reduce gastric

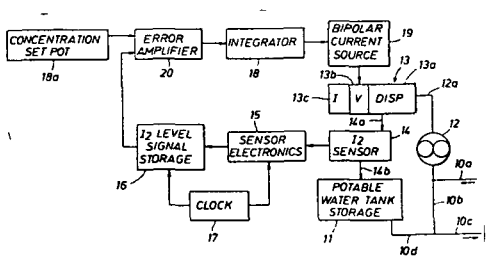


54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering biotechnology and space suits and protective clothing

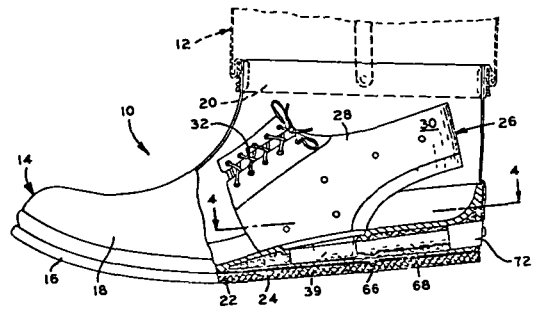
N78-14784* National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex
IODINE GENERATOR FOR RECLAIMED WATER PURIFICATION Patent
Richard A Wynveen (Life Systems Inc , Beachwood Ohio) James D Powell (Life Systems Inc Beachwood Ohio), and Franz H Schubert inventors (to NASA) (Life Systems Inc Beachwood Ohio) Issued 6 Dec 1977 5 p Filed 25 Apr 1975 Supersedes N75-25594 (13 - 16 p 2021) Sponsored by NASA (NASA-Case-MSC-14632-1 US-Patent-4 061 570 US-Patent-Appl-SN-571459 US-Patent-Class-210-96M US-Patent-Class-210-192 US-Patent-Class-204-180P US-Patent-Class-204-301 US-Patent-Class-23-253A) Avail US Patent Office CSCL 06K

The system disclosed is for controlling the iodine level in a water supply in a spacecraft It includes an iodine accumulator which stores crystalline iodine an electrochemical valve to control the input of iodine to the drinking water and an iodine dispenser A pump dispenses fluid through the iodine dispenser and an iodine sensor to a potable water tank storage The iodine sensor electronically detects the iodine level in the water and through electronic means produces a correction current control The correction current control operates the electro-chemical iodine valve to release iodine from the iodine accumulator into the iodine dispenser Official Gazette of the U S Patent Office



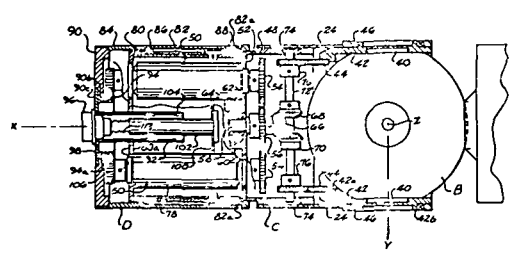
N78-17675* National Aeronautics and Space Administration Ames Research Center, Moffett Field Calif
WALKING BOOT ASSEMBLY Patent
Hubert C Vykukal Alan B Chambers and Roy H StJohn, inventors (to NASA) Issued 27 Dec 1977 7 p Filed 23 Dec 1976 Supersedes N77-14742 (15 - 05 p 0661) (NASA-Case-ARC-11101-1, US-Patent-4,064 642, US-Patent-Appl-SN-753976 US-Patent-Class-36-92, US-Patent-Class-36-119 US-Patent-Class-2-2 1A) Avail US Patent Office CSCL 05H

A walking boot assembly particularly suited for use with a positively pressurized spacesuit is presented A bootie adapted to be secured to the foot of a wearer, an hermetically sealed boot for receiving the bootie having a walking sole an inner sole, and an upper portion adapted to be attached to an ankle joint of a spacesuit are also described
Official Gazette of the U S Patent Office



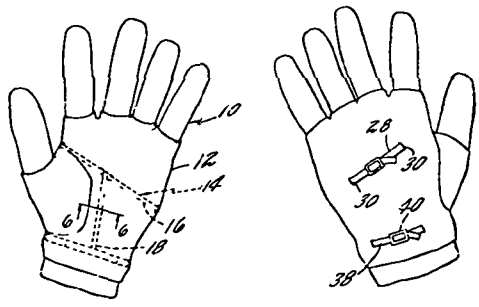
N78-17676* National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville Ala
WRIST JOINT ASSEMBLY Patent
Leendert Kersten (Nebraska Univ , Lincoln) and James Dwight Johnson inventors (to NASA) Issued 17 Jan 1978 10 p Filed 26 Jul 1976 Supersedes N76-28554 (14 - 19, p 2465) (NASA-Case-MFS-23311-1, US-Patent-4 068 763, US-Patent-Appl-SN-708800 US-Patent-Class-214-1CM, US-Patent-Class-3-12 5, US-Patent-Class-74-515E) Avail US Patent Office CSCL 05H

A wrist joint assembly is provided for use with a mechanical manipulator arm for finely positioning an end-effector carried by the wrist joint on the terminal end of the manipulator arm The wrist joint assembly is pivotable about a first axis to produce a yaw motion a second axis is to produce a pitch motion, and a third axis to produce a roll motion The wrist joint assembly includes a disk segment affixed to the terminal end of the manipulator arm and a first housing member a second housing member and a third housing member The third housing member and the mechanical end-effector are moved in the yaw, pitch, and roll motion Drive means are provided for rotating each of the housings about their respective axis which includes a cluster of miniature motors having spur gears carried on the output drive shaft which mesh with a center drive gear affixed on the housing to be rotated
Official Gazette of the U S Patent Office



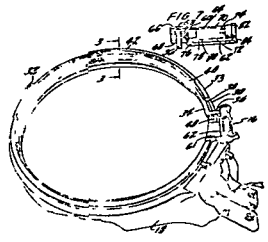
N78-17677* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex
RESTRAINING MECHANISM Patent
John C Hardy inventor (to NASA) (United Aircraft Corp East Hartford Conn) Issued 20 Jan 1970 3 p Filed 6 Oct 1966 Sponsored by NASA
(NASA-Case-MSC-13054 US-Patent-3 490 074, US-Patent-Appl-SN-585217 US-Patent-Class-2-161) Avail US Patent Office CSCL 05H

A restraining mechanism restraining a pressurized garment so as to limit its ballooning effect is described A helically wound spring is bonded at its outer periphery to an elongated flat plate which permits the flat plate to bend in a single direction The flat plate is attached to an inflatable glove to the palm side for restraining the glove from ballooning when inflated B B



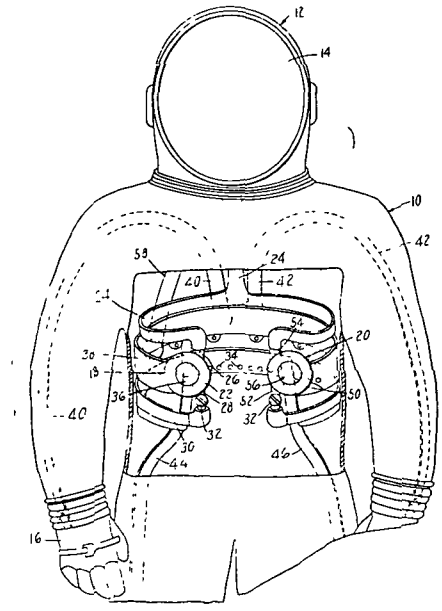
N78-17678* National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex
HELMET LATCHING AND ATTACHING RING Patent
Edward W Chase (United Aircraft Corp East Hartford, Conn) and Seppo J· Viikinsalo, inventors (to NASA) (United Aircraft Corp , East Hartford, Conn) Issued 13 Jan 1970 5 p Filed 17 Mar 1966 Sponsored by NASA
(NASA-Case-XMS-04670 US-Patent-3,488 771, US-Patent-Appl-SN-535169, US-Patent-Class-2-2 1) Avail US Patent Office CSCL 05H

A neck ring releasably secured to a pressurized garment carries an open-ended ring normally in the engagement position fitted into an annular groove and adapted to fit into a complementary annular groove formed in a helmet Camming means formed on the inner surface at the end of the helmet engages the open-ended ring to retract the same and allow for one motion donning even when the garment is pressurized A projection on the end of the split ring is engageable to physically retract the split ring Official Gazette of the U S Patent Office



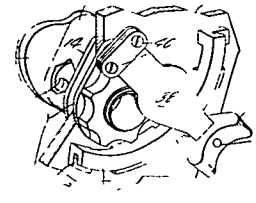
N78-17679* National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex
PROTECTIVE GARMENT VENTILATION SYSTEM Patent
Ronald Lang inventor (to NASA) (United Aircraft Corp East Hartford, Conn) Issued 6 Jan 1970 8 p Filed 6 Oct 1966 Sponsored by NASA
(NASA-Case-XMS-04928 US-Patent-3,487,765 US-Patent-Appl-SN-584914 US-Patent-Class-98-1) Avail US Patent Office CSCL 05H

A method and apparatus for ventilating a protective garment space suit system and/or pressure suits to maintain a comfortable and nontoxic atmosphere within is described The direction of flow of a ventilating and purging gas in portions of the garment may be reversed in order to compensate for changes in environment and activity of the wearer The entire flow of the ventilating gas can also be directed first to the helmet associated with the garment B B



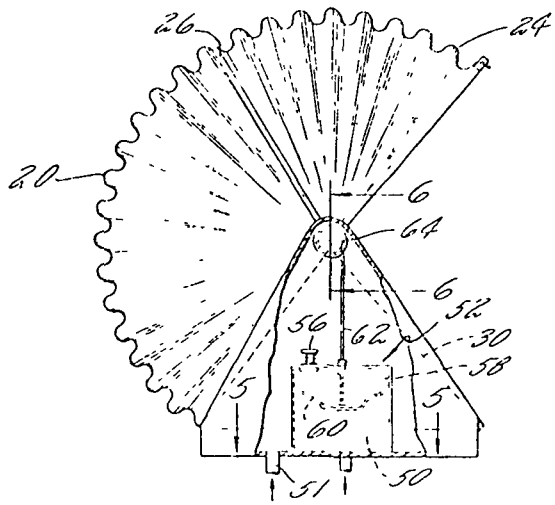
N78-17680* National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex
HELMET FEEDPORT Patent
Ewald Kothe inventor (to NASA) (United Aircraft Corp East Hartford Conn) Issued 26 Dec 1967 3 p Filed 30 Mar 1966 Sponsored by NASA
(NASA-Case-XMS-09653, US-Patent-3 359 568 US-Patent-Appl-SN-538863, US-Patent-Class-2-6) Avail US Patent Office CSCL 05H

A helmet design is described which encapsules the head of the wearer is capable of being pressurized and provides a means for gaining internal access for the purpose of eating A mechanically actuated valve that combines the purging of carbon dioxide and feeding operations by a simple movement of a mechanical lever obviates problems that are attendant in the type of feed and purge ports previously incorporated in pressurized helmets B L P



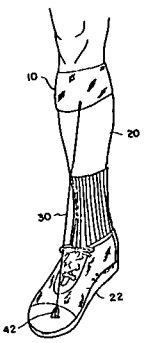
N78-18761* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston Tex
EMERGENCY SPACE-SUIT HELMET Patent
Harvey A Smith inventor (to NASA) (United Aircraft Corp , East Hartford Conn) Issued 2 Jun 1970 7 p Filed 24 Feb 1966 Sponsored by NASA
(NASA-Case-MSC-10954-1, US-Patent-3,514,785, US-Patent-Appl-SN-529884, US-Patent-Class-2-2 1) Avail US Patent Office CSCL 06K

A frusto-conically shaped distensible component is described which inflates to encircle a portion of the wearer's head and carries a collapsible member which automatically extends over the remaining portion of the head A pulley arrangement secured between the walls of the distensible component automatically extends and retracts the collapsible member When deflated the unit is carried on the back of the wearer so as to provide an automatic emergency space suit helmet
Official Gazette of the U S Patent Office



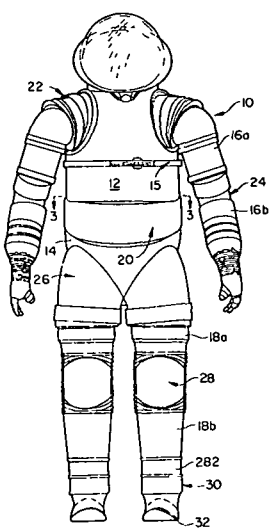
N78-18762*# National Aeronautics and Space Administration Langley Research Center Langley Station Va
DROP FOOT CORRECTIVE DEVICE Patent Application
Bert C Deis, inventor (to NASA) Filed 9 Feb 1978 11 p
(NASA-Case-LAR-12259-1, US-Patent-Appl-SN-876298) Avail NTIS HC A02/MF A01 CSCL 06B

A drop foot corrective device to alleviate a plurality of difficulties encountered in walking by a victim suffering from a drop foot condition is presented The invention consists essentially of an apparatus including a legband positionable to girdle the afflicted leg of the victim above the calf and below the knee, retaining and supporting the joint with a flexible ligament affixed to and extending from a toe of the foot or the toe of a shoe worn on the foot to the legband where it is anchored The novel feature of the device appears to lie in its unique structure which alleviates the problem of drop foot by providing the support needed and the flexibility required and furthermore is inexpensive, lightweight, inconspicuous, easily transferable from shoe to shoe, and may be worn with bare feet NASA



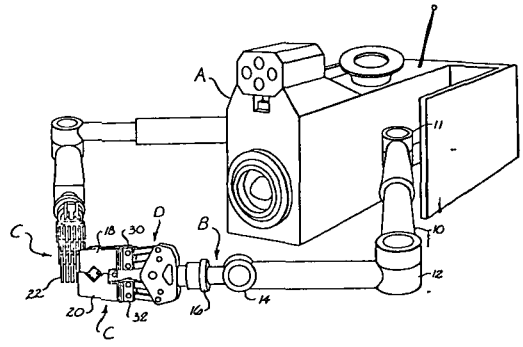
N78-18763*# National Aeronautics and Space Administration Ames Research Center Moffett Field Calif
SPACESUIT MOBILITY JOINTS Patent Application
Hubert C Vykukal, inventor (to NASA) Filed 3 Mar 1978 45 p
(NASA-Case-ARC-11058-2 US-Patent-Appl-SN-883094) Avail NTIS HC A03/MF A01 CSCL 05H

A spacesuit is presented having a waist joint shoulder joints, elbow joints hip joints, and ankle joints Each of the joints includes at least one pair of annuli supported for pivotal displacement about paralleling axes and a flexible, substantially impermeable diaphragm of a tubular configuration spanning the distance between the annuli and connected thereto in a hermetically sealed relationship The diaphragm includes at least one rolling convolution having a crown disposed in a fixed relation with an axis about which one of the annuli pivots The knee joint is constructed slightly different from the other joints A curved tubular shell is disposed between two circular bellows Cables are secured to the rings, shell, and bellows The cables limit the motion of the bellows when the suit is pressurized NASA



N78-19773*# National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala
END EFFECTOR DEVICE Patent Application
Keith H Clark, inventors (to NASA) and James D Johnston Filed 9 Mar 1978 11 p
(NASA-Case-MFS-23692-1, US-Patent-Appl-SN-885061) Avail NTIS HC A02/MF A01 CSCL 05H

A lightweight structure adapted for gripping objects of a variety of sizes and shapes with uniform tightness was designed for a mechanical manipulator arm of a space vehicle or other remote manipulator The end effector device includes a pair of movable jaws in opposed relation for gripping an object Each jaw has laterally spaced gripping fingers in the form of flat plates Each finger has a gripping face in which a notch is formed The gripping fingers of one of the jaws are carried alternately offset with respect to the fingers of the opposed jaw to permit the fingers to intermesh and provide a variably closed channel for gripping objects of various sizes and shapes The jaws are connected to an adapter mechanism by couplings which include a pair of spaced pivots on which a pair of linkage bars are mounted Each jaw is connected to its coupling through a flexible cartilage which prevents shearing of connecting rods and pins and provides for more effective gripping action The adapter mechanism is in turn connected to a mechanical wrist joint of a manipulator arm NASA

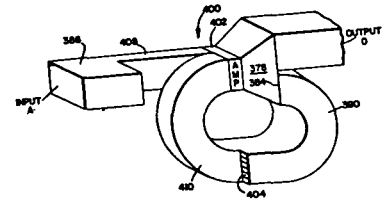


60 COMPUTER OPERATIONS AND HARDWARE

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

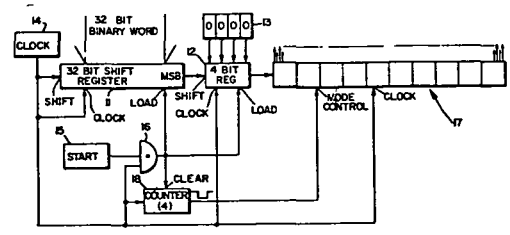
N78-10709* National Aeronautics and Space Administration Goddard Inst for Space Studies New York
MEMORY DEVICE FOR TWO-DIMENSIONAL RADIANT ENERGY ARRAY COMPUTERS Patent
David H Schaefer and James P Strong, III inventors (to NASA) Issued 4 Oct 1977 27 p Filed 13 Feb 1976 Supersedes N76-18803 (14 - 09 p 1171) Division of US Patent Appl SN-468614, filed 8 May 1974 US Patent 3 996 455
(NASA-Case-GSC-11839-2 US-Patent-4,052 705, US-Patent-Appl-SN-657996 US-Patent-Class-340-173LM US-Patent-Class-350-96R US-Patent-Class-356-169, US-Patent-Appl-SN-468614 US-Patent-4,996 455) Avail US Patent Office CSCL 09B

A memory device for two dimensional radiant energy array computers was developed, in which the memory device stores digital information in an input array of radiant energy digital signals that are characterized by ordered rows and columns The memory device contains a radiant energy logic storing device having a pair of input surface locations for receiving a pair of separate radiant energy digital signal arrays and an output surface location adapted to transmit a radiant energy digital signal array A regenerative feedback device that couples one of the input surface locations to the output surface location in a manner for causing regenerative feedback is also included
Official Gazette of the U S Patent Office



N78-17691* National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt, Md
BINARY TO BINARY CODED DECIMAL CONVERTER Patent
Anthony J Miller inventor (to NASA) Issued 17 Jan 1978 7 p Filed 12 Nov 1975 Supersedes N76-13781 (14 - 4 p 0495)
(NASA-Case-GSC-12044-1 US-Patent-4,069,478 US-Patent-Appl-SN-631341, US-Patent-Class-340-347DD) Avail US Patent Office CSCL 09B

A binary coded input signal is converted to a binary coded decimal signal having N decades by employing N four bit shift registers The bits of the input signal are sequentially supplied, in order to the least significant position of the register for the units decade, with the most significant bit of the input signal being applied to the units register first Each of the registers includes a right shift-parallel load mode control input terminal In response to the sum of the values stored in each register and the binary value 0011 being less than the binary value 1000, the mode control input terminal is activated to shift the register contents one bit to the right In response to the sum being greater than 1000, the mode control input terminal is activated to load the sum into the register
Official Gazette of the U S Patent Office



71 ACOUSTICS

Includes sound generation transmission and attenuation

For noise pollution see *45 Environment Pollution*

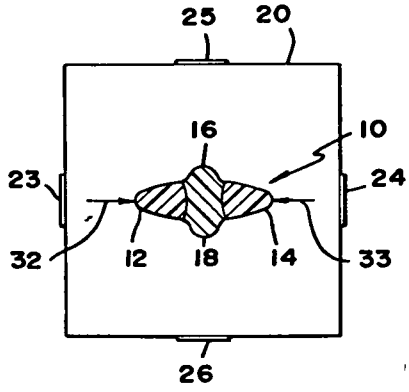
N78-10837* National Aeronautics and Space Administration Pasadena Office Calif

ACOUSTIC ENERGY SHAPING Patent

Taylor G Wang (JPL) and Daniel D Elleman inventors (to NASA) (JPL) Issued 4 Oct 1977 5 p Filed 13 Feb 1976 Supersedes N76-18886 (14 - 09 p 1182) Sponsored by NASA

(NASA-Case-NPO-13802-1, US-Patent-4,052,181, US-Patent-Appl-SN-658133, US-Patent-Class-65-2, US-Patent-Class-65-32 US-Patent-Class-65-87 US-Patent-Class-65-102 US-Patent-Class-65-DIG 4 US-Patent-Class-65-DIG 7, US-Patent-Class-65-4B US-Patent-Class-73-505 US-Patent-Class-264-23 U S-Patent-Class-264-345) Avail US Patent Office CSCL 20A

A suspended mass is shaped by melting all or a selected portion of the mass and applying acoustic energy in varying amounts to different portions of the mass In one technique for forming an optical waveguide slug a mass of oval section is suspended and only a portion along the middle of the cross-section is heated to a largely fluid consistency Acoustic energy is applied to opposite edges of the oval mass to press the unheated opposite edge portions together so as to form bulges at the middle of the mass In another technique for forming a ribbon of silicon for constructing solar cells a cylindrical thread of silicon is drawn from a molten mass of silicon and acoustic energy is applied to opposite sides of the molten thread to flatten it into a ribbon Official Gazette of the U S Patent Office



N78-14867* National Aeronautics and Space Administration Langley Research Center Langley Station Va

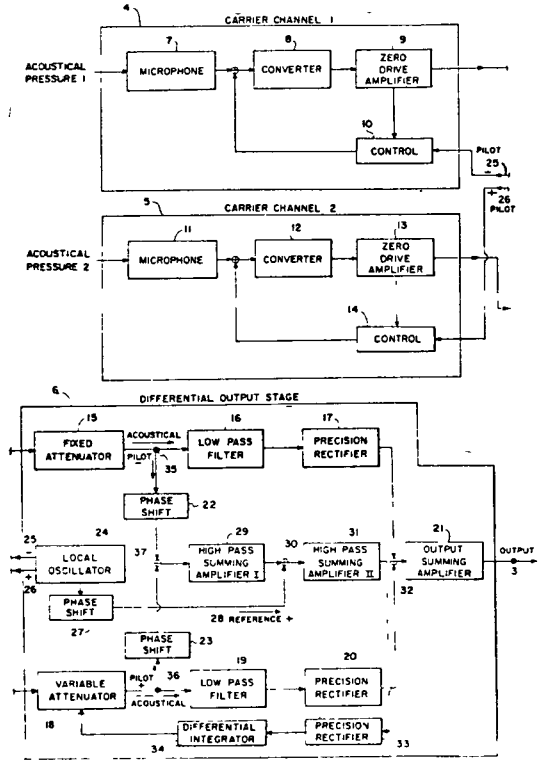
DIFFERENTIAL SOUND LEVEL METER Patent

Allan J Zuckerwar inventor (to NASA) (Old Dominion Univ Norfolk Va) Issued 6 Dec 1977 13 p Filed 8 Nov 1976 Supersedes N77-23441 (15 - 14, p 1854) Sponsored by NASA

(NASA-Case-LAR-12106-1 US-Patent-4 061 041 US-Patent-Appl-SN-740156 US-Patent-Class-73-646 US-Patent-Class-330-52) Avail US Patent Office CSCL 20A

Small differences between relatively high sound pressure levels at two different microphone sites are measured by a device which provides electrical insertion voltages (pilot voltages) as a a means for continuously monitoring the gains of two acoustical channels The difference between two pilot voltages is utilized to force the gain of one channel to track the other channel

Official Gazette of the U S Patent Office



N78-17821*# National Aeronautics and Space Administration Langley Research Center Langley Station Va

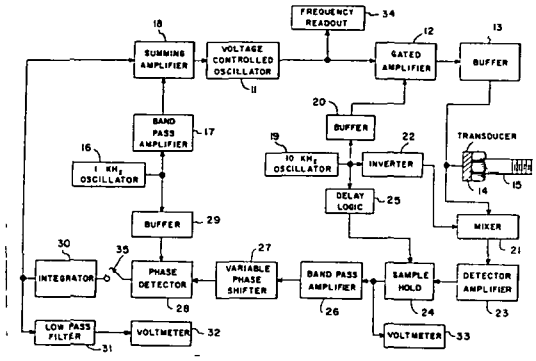
PSEUDO CONTINUOUS WAVE ACOUSTIC INSTRUMENT Patent Application

Joseph S Heyman, inventor (to NASA) Filed 8 Dec 1977 12 p

(NASA-Case-LAR-12260-1, US-Patent-Appl-SN-858763) Avail NTIS HC A02/MF A01 CSCL 20F

A device for measuring acoustic properties and their changes in a sample of liquid, gas, plasma or solid is described A variable frequency source is applied 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 is indicative of the shift in frequency of the mechanical resonant peak and the amplitude of the acoustic signals is indicative of the attenuation of the acoustic signals in the sample NASA



N78-19898*# National Aeronautics and Space Administration Pasadena Office, Calif

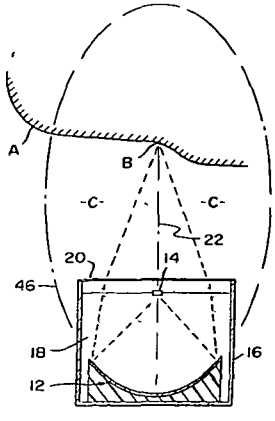
RESOLUTION ENHANCED SOUND DETECTING APPARATUS Patent Application

James M Kendall, inventor (to NASA) (JPL) Filed 16 Dec 1977 10 p

(Contract NAS7-100)

(NASA-Case-NPO-14134-1 US-Patent-Appl-SN-861392) Avail NTIS HC A02/MF A01 CSCL 20A

The acuity of an acoustic mirror and microphone system is increased in order to precisely detect the location of a noise source such as that created by an airframe in a wind tunnel, or by machinery The apparatus which includes mirror which reflects sound from a source to a microphone, can be shifted until the noise detected by microphone is loudest, to determine the precise location from which the sound originates An enclosure is positioned around the mirror and is filled with a heavy gas such as Freon The sound waves move slower in the heavy gas than in air, so the wavelength of sound waves is shorter, and the mirror can more accurately focus the sound waves onto the microphone A pair of thin sheets in front of the mirror is pressed apart by slightly pressured air between them so that all light rays pass perpendicular to the interface between the air in front of the wall and the Freon gas behind wall and are not refracted by the Freon gas NASA



72 ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure and molecular spectra

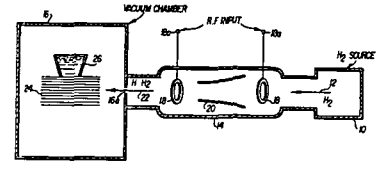
N78-19907*# National Aeronautics and Space Administration Lewis Research Center Cleveland, Ohio

ATOMIC HYDROGEN STORAGE METHOD AND APPARATUS Patent Application

John A Woolam, inventor (to NASA) Filed 29 Sep 1977 10 p

(NASA-Case-LEW-12081-2, US-Patent-Appl-SN-837794) Avail NTIS HC A02/MF A01 CSCL 20H

Atomic hydrogen for use as a fuel or as 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 recombining to form molecules NASA



73 NUCLEAR AND HIGH-ENERGY PHYSICS

Includes elementary and nuclear particles, and reactor theory

For space radiation see *93 Space Radiation*

N78-19920* National Aeronautics and Space Administration Washington D C

NON-EQUILIBRIUM RADIATION NUCLEAR REACTOR Patent

Karlheinz Thom and Richard T Schneider, inventors (to NASA) (Fla Univ, Gainesville) Issued 21 Feb 1978 8 p Filed 21 Mar 1975 Supersedes N75-22108 (13 - 13 p 1574)

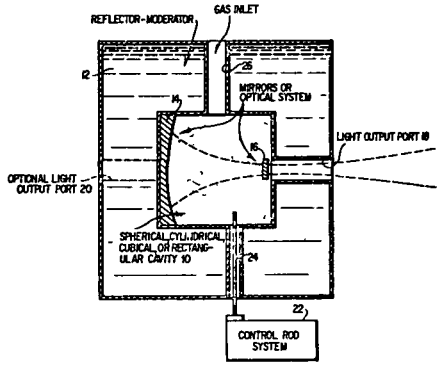
(NASA-Case-HQN-10841-1, US-Patent-4 075 057

US-Patent-Appl-SN-560891, US-Patent-Class-176-39,

US-Patent-Class-330-4 3) Avail US Patent Office CSCL 18K

An externally moderated thermal nuclear reactor is disclosed which is designed to provide output power in the form of electromagnetic radiation The reactor is a gaseous fueled nuclear cavity reactor device which can operate over wide ranges of temperature and pressure and which includes the capability of processing and recycling waste products such as long-lived

transuranium actinides The primary output of the device may be in the form of coherent radiation, so that the reactor may be utilized as a self-critical nuclear pumped laser
Official Gazette of the U S Patent Office

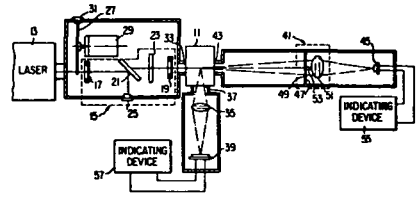


74 OPTICS

Includes light phenomena

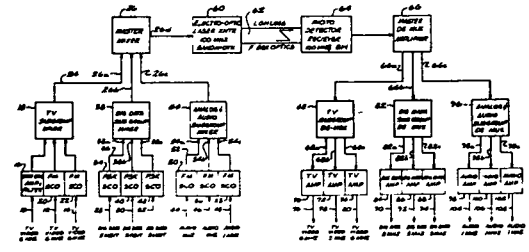
N78-13874* National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt Md
THE 2 DEG/90 DEG LABORATORY SCATTERING PHOTOMETER Patent
William R McCluney inventor (to NASA) Issued 11 Oct 1977 6 p Filed 13 Jan 1976 Supersedes N76-17369 (14 - 08 p 0976)
(NASA-Case-GSC-12088-1 US-Patent-4 053 229
US-Patent-Appl-SN-648700, US-Patent-Class-356-103
US-Patent-Class-356-104) Avail US Patent Office CSCL 20F

A scattering photometer for measuring the light scattered by particles in a hydrosol at substantially 2 deg and 90 deg simultaneously is described Light from a source is directed by a first optical system into a scattering cell containing the hydrosol under study Light scattered at substantially 90 deg to the incident beam is focused onto a first photoelectric detector to generate an electrical signal indicative of the amount of scattered light at substantially 90 deg Light scattered at substantially 2 deg to the incident beam is directed through an annular aperture symmetrically located about the axis of the illuminating beam which is linearly transmitted undeviated through the hydrosol and focused onto a second photoelectric detector to generate an electrical signal indicative of the amount of light scattered at substantially 2 deg Official Gazette of the U S Patent Office



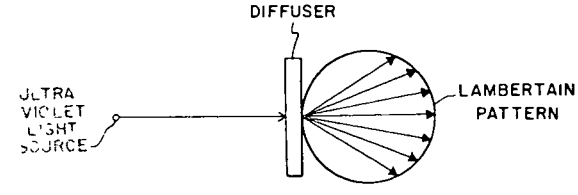
N78-14889* National Aeronautics and Space Administration John F Kennedy Space Center Cocoa Beach Fla
FIBER OPTIC MULTIPLEX OPTICAL TRANSMISSION SYSTEM Patent
Charles H Bell inventor (to NASA) Issued 6 Dec 1977 8 p Filed 18 Aug 1976 Supersedes N77-15826 (15 - 06 p 0813)
(NASA-Case-KSC-11047-1 US-Patent-4 061,577
US-Patent-Appl-SN-715485, US-Patent-Class-250-199
US-Patent-Class-358-142 US-Patent-Class-179-91R) Avail US Patent Office CSCL 20F

A multiplex optical transmission system which minimizes external interference while simultaneously receiving and transmitting video digital data, and audio signals is described Signals are received into subgroup mixers for blocking into respective frequency ranges The outputs of these mixers are in turn fed to a master mixer which produces a composite electrical signal An optical transmitter connected to the master mixer converts the composite signal into an optical signal and transmits it over a fiber optic cable to an optical receiver which receives the signal and converts it back to a composite electrical signal A de-multiplexer is coupled to the output of the receiver for separating the composite signal back into composite video, digital data and audio signals A programmable optic patch board is interposed in the fiber optic cables for selectively connecting the optical signals to various receivers and transmitters
Official Gazette of the U S Patent Office



N78-15879* National Aeronautics and Space Administration Langley Research Center, Langley Station, Va
TRANSMITTING AND REFLECTING DIFFUSER Patent
Lloyd S Keafer Jr Ernest E Burcher and Leonard P Kopia inventors (to NASA) Issued 13 Dec 1977 6 p Filed 18 Jun 1973 Supersedes N73-32538 (11 - 23 p 2819) Division of US Patent Appl SN-239803 filed 30 Mar 1970 US Patent 3 779 788 and a continuation-in-part of abandoned US Patent Appl SN 38816 filed 19 May 1970
(NASA-Case-LAR-10385-3 US-Patent-4 062 996
US-Patent-Appl-SN-370999 US-Patent-Class-428-334
US-Patent-Class-428-336 US-Patent-Class-428-426
US-Patent-Class-428-428 US-Patent-Class-350-1
US-Patent-3 779 788 US-Patent-Appl-SN-239803
US-Patent-Appl-SN-38816) Avail US Patent Office CSCL 20F

An ultraviolet grade fused silica substrate is coated with vaporized fused silica The coating thickness is controlled one thickness causing ultraviolet light to diffuse and another thickness causing ultraviolet light to reflect a near Lambertian pattern
Official Gazette of the U S Patent Office



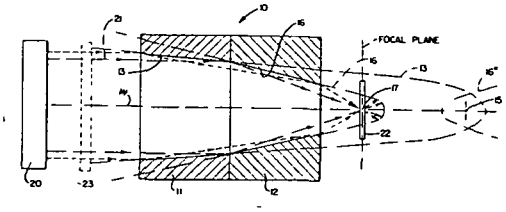
N78-15880* National Aeronautics and Space Administration Marshall Space Flight Center Huntsville Ala

METHOD OF AND MEANS FOR TESTING A GLANCING-INCIDENCE MIRROR SYSTEM OF AN X-RAY TELESCOPE Patent

Carroll C Dailey inventor (to NASA) Issued 13 Dec 1977 6 p Filed 25 Nov 1975 Supersedes N76-26988 (14 - 17 p 2257) Continuation-in-part of abandoned US Patent Appl SN-445398 filed 25 Feb 1974

(NASA-Case-MFS-22409-2 US-Patent-4 063 088 US-Patent-Appl-SN-636193 US-Patent-Class-250-272 US-Patent-Class-250-320 US-Patent-Appl-SN-445398) Avail US Patent Office CSCL 20F

An apparatus was designed for measuring the resolution and efficiency of a glancing-incidence mirror system having an even number of coaxial and confocal reflecting surfaces for use in an X-ray telescope A collimated beam of X-rays is generated by an X-ray laser and directed along the axis of the system so that the beam is incident on the reflecting surfaces and illuminates a predetermined area An X-ray detector such as a photographic film is located at the common focus of the surfaces so that the image produced by the X-rays may be compared with a test pattern interposed between the laser and t ^ system Official Gazette of the U S Patent Of



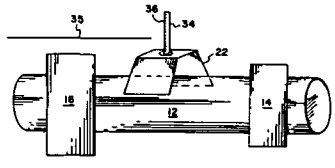
N78-15883*# National Aeronautics and Space Administration Langley Research Center Langley Station Va

ROTARY TARGET V-BLOCK Patent Application

Charlton W Mann inventor (to NASA) Filed 21 Nov 1977 13 p

(NASA-Case-LAR-12007-1 US-Patent-Appl-SN-853676) Avail NTIS HC A02/MF A01 CSCL 20F

A device is disclosed for measuring the distance from a reference plane to a flat or cylindrical surface The device contains a rotatable measuring scale which is sited with an optical instrument to make the measurement Readings are taken at various points along the surface to establish an elevation curve which is used to align the surface with the reference plane NASA

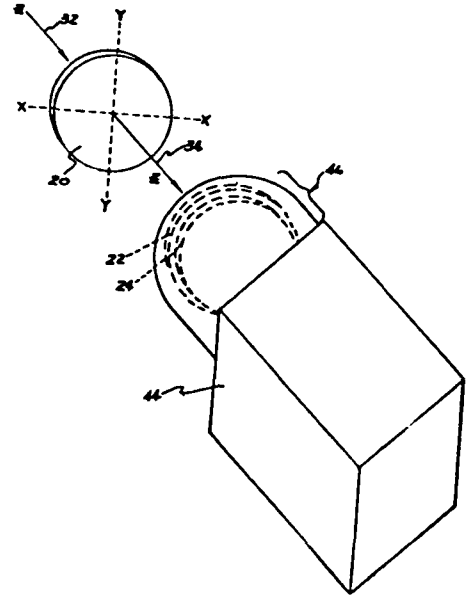


N78-17865* National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston, Tex

OPTICAL CONVERSION METHOD Patent

William E Perry, inventor (to NASA) Issued 3 Jan 1978 5 p Filed 21 Jan 1976 Supersedes N76-18917 (14 - 09 p 1186 (NASA-Case-MSC-12618-1, US-Patent-4,067 043 US-Patent-Appl-SN-651007, US-Patent-Class-358-55, US-Patent-Class-358-41, US-Patent-Class-358-225, US-Patent-Class-350-159) Avail US Patent Office CSCL 20F

An optical pickup comprising an electrooptical device located between two crossed polarizing devices all positioned along a common optical axis is described for switching a TV system between a color mode and a black and white mode Embodiments in which the electrooptical system is used as a neutral density filter, a selective color filter, or a light shutter as applied to a television camera are described Where the optical system is used as a selective color filter to produce light beams of alternating color in a field sequential color television system, deactivation of the optical system renders the television a black and white system Official Gazette of the U S Patent Office



N78-17866* National Aeronautics and Space Administration Langley Research Center Langley Station, Va

OPTICAL SCANNER Patent

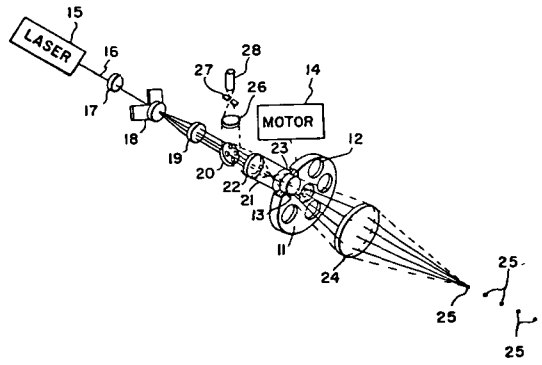
David B Rhodes, inventor (to NASA) Issued 20 Dec 1977 4 p Filed 6 Apr 1976 Supersedes N76-23985 (14 - 14, p 1855)

(NASA-Case-LAR-11711-1 US-Patent-4 063,814, US-Patent-Appl-SN-674195, US-Patent-Class-356-28, US-Patent-Class-250-201, US-Patent-Class-350-204) Avail US Patent Office CSCL 02F

An optical scanner that sequentially focuses optical energy (light) at selected points in space is described The essential component is a scanning wheel including several glass windows with each window having a different thickness Due to this difference in thickness, the displacement of the emerging light from the incident light is different for each window The scanner transmits optical energy to a point in space while at the same time receiving any optical energy generated at that point and

then moves on to the next selected point and repeats this transmit and receive operation It fills the need for a system that permits a laser velocimeter to rapidly scan across a constantly changing flow field in an aerodynamic test facility

Official Gazette of the U S Patent Office



N78-17867* National Aeronautics and Space Administration Pasadena Office Calif

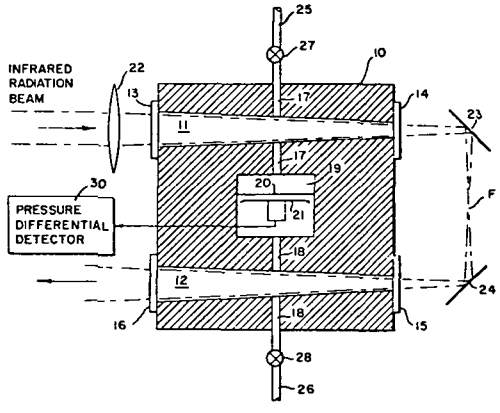
DIFFERENTIAL OPTOACOUSTIC ABSORPTION DETECTOR Patent

Michael S Shumate inventor (to NASA) (JPL) Issued 10 Jan 1978 8 p Filed 27 Aug 1976 Supersedes N77-11363 (15 - 02 p 0194) Sponsored by NASA

(NASA-Case-NPO-13759-1 US-Patent-4,067,653, US-Patent-Appl-SN-718266, US-Patent-Class-356-204, US-Patent-Class-250-344 US-Patent-Class-356-246) Avail US Patent Office CSCL 20F

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

Official Gazette of the U S Patent Office



N78-18905* National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt, Md

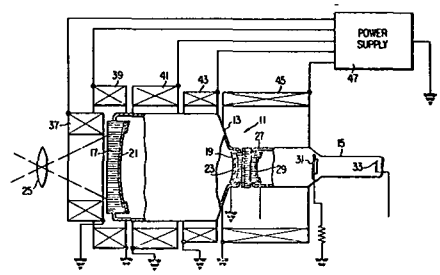
MAGNIFYING IMAGE INTENSIFIER Patent

James Vine, inventor (to NASA) (Westinghouse Electric Corp, Pittsburgh) Issued 24 Jan 1978 5 p Filed 28 Apr 1976 Supersedes N76-23482 (14 - 14, p 1790) Sponsored by NASA

(NASA-Case-GSC-12010-1, US-Patent-4,070,574, US-Patent-Appl-SN-680958, US-Patent-Class-250-213VT, US-Patent-Class-313-94, US-Patent-Class-313-442) Avail US Patent Office CSCL 20F

A magnetically focused image intensifier was improved to increase the usable range of magnification without degradation of image quality The power requirements of the focusing coils are minimal The arrangement of the focusing coils reverses the direction of the axial magnetic field distribution between the planes of the photocathode and the phosphor screen

Official Gazette of the U S Patent Office



76 SOLID-STATE PHYSICS

Includes superconductivity

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

N78-13917*# *National Aeronautics and Space Administration* Pasadena Office Calif

HIGH RESOLUTION THRESHOLD PHOTOELECTRON SPECTROSCOPY BY ELECTRON ATTACHMENT Patent Application

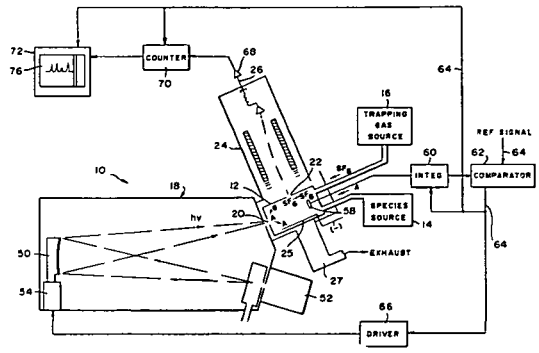
Ara Chutjian (JPL) and Joseph M Ajello, inventors (to NASA) (JPL) Filed 30 Nov 1977 13 p

(Contract NAS7-100)

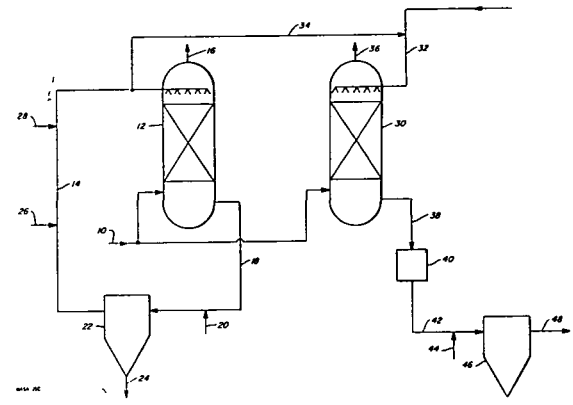
(NASA-Case-NPO-14078-1 US-Patent-Appl-SN-856466) Avail NTIS HC A02/MF A01 CSCL 20L

The stable energy levels of a species ion of an atomic molecular or radical type are determined by application of a predetermined level of ionizing energy such as through photoionization A trapping gas is added to the gaseous species to provide a technique for detection of the energy levels The electrons emitted from ionized species are captured by the trapping gas, only if the electrons have substantially zero kinetic energy If the electrons have nearly zero energy, they are absorbed by the trapping gas to produce negative ions of the trapping gas that can be detected by a mass spectrometer The light frequencies

at which large quantities of trapping gas ions are detected are the stable energy levels of the positive ion of the species SF6 and CFC13 have the narrowest acceptance bands so that when they are used as the trapping gas, they bind electrons (to form negative ions) only when the electrons have very close to zero kinetic energy NASA



domestic sewage 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 both the gas stream and the waste water (containing less iron) are controlled in an open loop gas-liquid scrubbing zone Contract in the open loop scrubbing zone is sufficient to acidify the waste water which is then treated to remove solids originally present NASA



85 URBAN TECHNOLOGY AND TRANSPORTATION

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

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

N78-15954*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston Tex

SIMULTANEOUS TREATMENT OF SO2 CONTAINING STACK GASES AND WASTE WATER Patent Application

Jerry C Poradek and D Dixon Collins, inventors (to NASA) (Chemsoil Corp, Bakersfield Calif) Filed 21 Nov 1977 22 p (Contract NAS9-14639)

(NASA-Case-MSC-16258-1, US-Patent-Appl-SN-853705) Avail NTIS HC A02/MF A01 CSCL 13B

A process is described for simultaneously removing sulfur dioxide from stack gases and purifying waste water derived from

1 Report No	2 Government Accession No	3 Recipient's Catalog No
NASA SP-7039 (13)		

4 Title and Subtitle	5 Report Date
NASA PATENT ABSTRACTS BIBLIOGRAPHY A Continuing Bibliography (Supplement 13)	July 1978
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7 Author(s)	8 Performing Organization Report No
	10 Work Unit No
9 Performing Organization Name and Address National Aeronautics and Space Administration Washington, D. C. 20546	11 Contract or Grant No
	13 Type of Report and Period Covered
12 Sponsoring Agency Name and Address	14 Sponsoring Agency Code

15 Supplementary Notes

Section 1 - Abstracts

16 Abstract

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