NASA SP-7039(07)
Section 1
Abstracts

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

JULY 1975

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ACCESSION NUMBER RANGES

Bibliography Number	*STAR Accession Numbers*
NASA SP-7039(04)	N69-20701—N73-33931
NASA SP-7039(05)	N74-10001—N74-21629
NASA SP-7039(06)	N74-21630—N74-35363
NASA SP-7039(07)	N75-10001—N75-21218

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NASA SP-7039(07)
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NASA

PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

Annotated references to NASA-owned inventions covered by U.S. patents and applications for patent that were announced in *Scientific and Technical Aerospace Reports (STAR)* between January 1975 and June 1975.

Scientific and Technical Information Office JULY 1975
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C.

This Supplement is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161, for $3.00. For copies mailed to addresses outside the United States, add $2.50 per copy for handling and postage.

INTRODUCTION

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

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

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

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

The 158 citations published in this issue of the Abstract Section cover the period January 1975 through June 1975. The Index Section contains references to the 2830 citations covering the period May 1969 through June 1975.

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 date elements appear 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 FROM

PATENT ABSTRACTS BIBLIOGRAPHY

NASA SPONSORED DOCUMENT

AVAILABLE ON MICROFICHE

NASA ACCESSION NUMBER

N75-16613*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

SOURCE

TITLE

VARIABLE DIHEDRAL SHUTTLE ORBITER Patent Application

INVENTORS

Bernard Spencer, Jr., John W. Wilkey, Jr., and Beverly Z. Henry, Jr., inventors (to NASA) Filed 11 Feb. 1975 10 p

US PATENT APPLICATIONS SERIAL NUMBER

NASA CASE NUMBER

(NASA-Case-LAR-10706-1; US-Patent-Appl-SN-549239) Avail: NTIS HC $3.25 CSCL 22B

AVAILABILITY

ABSTRACT

An aircraft configuration is described which yields efficient flight at both subsonic and hypersonic speeds and which permits the wings to be protected from the hostile heat environment of orbital reentry. The essential feature is a variable dihedral wing which may be folded out during flight to adjust the aircraft's flight characteristic as the speed decreases. During hypersonic flight the wings are folded upright against the fuselage, while for the lowest speed operation the wings are fully extended in a horizontal manner. Intermediate positions of extension are used for intermediate speed ranges. NASA

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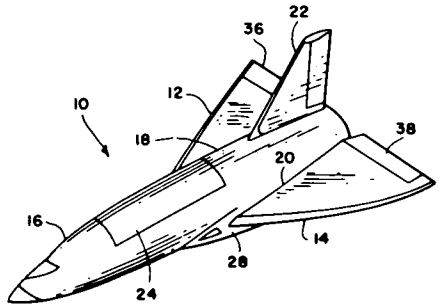


KEY ILLUSTRATION

INDEX SECTION (SECTION 2)

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

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

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

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

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

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

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

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

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

(1) *Using Subject Category:* To identify all NASA inventions in any one of the subject categories in this issue of *NASA PAB*, select the desired Subject Category in the Abstract Section (Section 1) and find the inventions abstracted thereunder. For previous *NASA PAB* issues, the Table of Contents to Section 1 should be examined as the subject categories were changed beginning with *NASA PAB(07)*.

(2) *Using Subject Index:* To identify all NASA inventions listed under a desired technical subject index term, (A) turn to the cumulative Subject Index in the Index Section and find the invention(s) listed under the desired technical subject term. (B) Note the indicated

Accession Number and the Subject Category Number. (C) Using the indicated Accession Number, turn to the inside front cover of the Index Section to determine which issue of the Abstract Section includes the Accession Number desired. (D) To find the abstract of the particular invention in the issue of the Abstract Section selected, (i) use the Subject Category Number to locate the Subject Category and (ii) use the Accession Number to locate the desired invention within the Subject Category listing.

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

PUBLIC AVAILABILITY OF COPIES OF PATENTS AND PATENT APPLICATIONS

Copies of U.S. patents may be purchased directly from the U.S. Patent Office, Washington, D.C. 20231, for fifty cents a copy.

Copies of pending NASA applications for patent abstracted in *NASA PAB* are sold by the National Technical Information Service. Springfield, Virginia 22161, at the price shown in the citation. Microfiche are sold at the established unit price of $2.25. When ordering copies of an application for patent from NTIS, the U.S. Patent Application Serial Number listed in the index or shown in the citation for each abstract should be used to identify the desired application for patent.

LICENSES FOR COMMERCIAL USE: INQUIRIES AND APPLICATIONS FOR LICENSE

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

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

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

NASA Case Number Prefix Letters	Address of Cognizant NASA Patent Counsel
ARC-xxxxx XAR-xxxxx	Ames Research Center Mail Code: 200-11A Moffett Field, California 94035 Telephone: (415)965-5104
ERC-xxxxx XER-xxxxx HQN-xxxxx XHQ-xxxxx	NASA Headquarters Mail Code: GP Washington, D.C. 20546 Telephone: (202)755-3954
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301)982-2351
KSC-xxxxx XKS-xxxxx	John F. Kennedy Space Center Mail Code: AA-PAT Kennedy Space Center, Florida 32899 Telephone: (305)867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code: 456 Langley Station Hampton, Virginia 23365 Telephone: (804)827-3725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code: 500-113 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: CCO1 Huntsville, Alabama 35812 Telephone: (205)453-0020
NPO-xxxxx XNP-xxxxx FRC-xxxxx XFR-xxxxx WOO-xxxxx	NASA Pasadena 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.

NASA FOREIGN PATENT LICENSING REGULATIONS

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

TABLE OF CONTENTS

Section 1 • Abstracts

AERONAUTICS

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

For related information see also *Astronautics*.

01 AERONAUTICS (GENERAL) N.A.

02 AERODYNAMICS N.A.

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

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

03 AIR TRANSPORTATION AND SAFETY N.A.

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

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

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION N.A.

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

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

05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE 1

Includes aircraft simulation technology.

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

06 AIRCRAFT INSTRUMENTATION 1

Includes cockpit and cabin display devices; and flight instruments.

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

07 AIRCRAFT PROPULSION AND POWER N.A.

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

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

08 AIRCRAFT STABILITY AND CONTROL N.A.

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

09 RESEARCH AND SUPPORT FACILITIES (AIR) 2

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tube facilities; and engine test blocks.

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

ASTRONAUTICS

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

For related information see also *Aeronautics*.

12 ASTRONAUTICS (GENERAL) N.A.

For extraterrestrial exploration see *91 Lunar and Planetary Exploration*.

13 ASTRODYNAMICS N.A.

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

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

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

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

15 LAUNCH VEHICLES AND SPACE VEHICLES 3

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

16 SPACE TRANSPORTATION N.A.

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

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

17 SPACECRAFT COMMUNICATIONS, COMMAND AND TRACKING N.A.

Includes telemetry; space communications networks; astronavigation; and radio blackout.

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

18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE 3

Includes spacecraft thermal and environmental control; and attitude control.

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

19 SPACECRAFT INSTRUMENTATION N.A.
For related information see also *06 Aircraft Instrumentation* and *35 Instrumentation and Photography.*

20 SPACECRAFT PROPULSION AND POWER 4
Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.
For related information see also *07 Aircraft Propulsion and Power, 28 Propellants and Fuels,* and *44 Energy Production and Conversion.*

CHEMISTRY AND MATERIALS

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

23 CHEMISTRY AND MATERIALS (GENERAL) 5
Includes biochemistry and organic chemistry.

24 COMPOSITE MATERIALS 5
Includes laminates.

25 INORGANIC AND PHYSICAL CHEMISTRY 6
Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.
For related information see also *77 Thermodynamics and Statistical Physics.*

26 METALLIC MATERIALS 8
Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

27 NONMETALLIC MATERIALS N.A.
Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

28 PROPELLANTS AND FUELS N.A.
Includes rocket propellants, igniters, and oxidizers; storage and handling; and aircraft fuels.
For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power,* and *44 Energy Production and Conversion.*

ENGINEERING

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

31 ENGINEERING (GENERAL) 9
Includes vacuum technology; control engineering; display engineering; and cryogenics.

32 COMMUNICATIONS 9
Includes land and global communications; communications theory; and optical communications.
For related information see also *04 Aircraft Communications and Navigation* and *17 Spacecraft Communications, Command and Tracking.*

33 ELECTRONICS AND ELECTRICAL ENGINEERING 11
Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.
For related information see also *60 Computer Operations and Hardware* and *76 Solid-State Physics.*

34 FLUID MECHANICS AND HEAT TRANSFER 18
Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.
For related information see also *02 Aerodynamics* and *77 Thermodynamics and Statistical Physics.*

35 INSTRUMENTATION AND PHOTOGRAPHY 19
Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.
For aerial photography see *43 Earth Resources.* For related information see also *06 Aircraft Instrumentation* and *19 Spacecraft Instrumentation.*

36 LASERS AND MASERS 31
Includes parametric amplifiers.

37 MECHANICAL ENGINEERING 34
Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

38 QUALITY ASSURANCE AND RELIABILITY N.A.
Includes product sampling procedures and techniques; and quality control.

39 STRUCTURAL MECHANICS N.A.
Includes structural element design and weight analysis; fatigue; and thermal stress.
For applications see *05 Aircraft Design, Testing and Performance* and *18 Spacecraft Design, Testing and Performance.*

GEOSCIENCES

Includes geosciences (general); earth resources; energy production and conversion; environment pollution; geophysics; meteorology and climatology; and oceanography.
For related information see also *Space Sciences.*

42 GEOSCIENCES (GENERAL) N.A.

43 EARTH RESOURCES **N.A.**
Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.
For instrumentation see *35 Instrumentation and Photography.*

44 ENERGY PRODUCTION AND CONVERSION **40**
Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.
For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *85 Urban Technology and Transportation.*

45 ENVIRONMENT POLLUTION **N.A.**
Includes air, noise, thermal and water pollution; environment monitoring; and contamination control.

46 GEOPHYSICS **N.A.**
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) **41**
Includes genetics.

52 AEROSPACE MEDICINE **42**
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 **42**
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**
Includes computer graphics and data processing.
For components see *33 Electronics and Electrical Engineering.*

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

62 COMPUTER SYSTEMS **43**
Includes computer networks.

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

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

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

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

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

PHYSICS

Includes physics (general); acoustics; atomic and molecular physics; nuclear and high-energy physics; optics; plasma physics; solid-state physics; and thermodynamics and statistical physics.
For related information see also *Engineering.*

70 PHYSICS (GENERAL) **44**
For geophysics see *46 Geophysics.* For astrophysics see *90 Astrophysics.* For solar physics see *92 Solar Physics.*

71 ACOUSTICS 44
Includes sound generation, transmission, and attenuation.
For noise pollution see *45 Environment Pollution.*

72 ATOMIC AND MOLECULAR PHYSICS N.A.
Includes atomic structure and molecular spectra.

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

74 OPTICS 44
Includes light phenomena.

75 PLASMA PHYSICS 45
Includes magnetohydrodynamics and plasma fusion.
For ionospheric plasmas see *46 Geophysics.* For space plasmas see *90 Astrophysics.*

76 SOLID-STATE PHYSICS 45
Includes superconductivity.
For related information see also *33 Electronics and Electrical Engineering* and *36 Lasers and Masers.*

77 THERMODYNAMICS AND STATISTICAL PHYSICS 46
Includes quantum mechanics; and Bose and Fermi statistics.
For related information see also *25 Inorganic and Physical Chemistry* and *34 Fluid Mechanics and Heat Transfer.*

SOCIAL SCIENCES

Includes social sciences (general); administration and management; documentation and information science; economics and cost analysis; law and political science; and urban technology and transportation.

80 SOCIAL SCIENCES (GENERAL) N.A.
Includes educational matters.

81 ADMINISTRATION AND MANAGEMENT N.A.
Includes management planning and research.

82 DOCUMENTATION AND INFORMATION SCIENCE N.A.
Includes information storage and retrieval technology; micrography; and library science.
For computer documentation see *61 Computer Programming and Software.*

83 ECONOMICS AND COST ANALYSIS N.A.
Includes cost effectiveness studies.

84 LAW AND POLITICAL SCIENCE N.A.
Includes space law; international law; international cooperation; and patent policy.

85 URBAN TECHNOLOGY AND TRANSPORTATION N.A.
Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.
For related information see *03 Air Transportation and Safety, 16 Space Transportation,* and *44 Energy Production and Conversion.*

SPACE SCIENCES

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

88 SPACE SCIENCES (GENERAL) N.A.

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

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

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

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

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

GENERAL

99 GENERAL N.A.

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

Section 2 • Indexes

SUBJECT INDEX
INVENTOR INDEX
SOURCE INDEX
NUMBER INDEX
ACCESSION NUMBER INDEX

JULY 1975 (Supplement 7)

NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

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.*

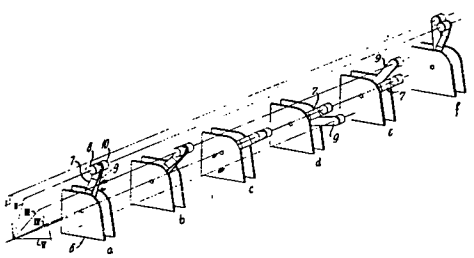
N75-12930* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

INTEGRATED LIFT/DRAG CONTROLLER FOR AIRCRAFT Patent

John W. Olcott (Aeronaut. Res. Assoc. of Princeton, Inc.), Edward Seckel (Aeronaut. Res. Assoc. of Princeton, Inc.), and David R. Ellis, inventors (to NASA) (Aeronaut. Res. Assoc. of Princeton, Inc.) Issued 26 Nov. 1974 11 p Filed 23 Mar. 1972 Supersedes N73-30938 (11 - 22, p 2613) Sponsored by NASA

(NASA-Case-ARC-10456-1; US-Patent-3,850,388; US-Patent-Appl-SN-237491; US-Patent-Class-244-75R; US-Patent-Class-74-480R; US-Patent-Class-244-83R; US-Patent-Class-416-25) Avail: US Patent Office CSCL 01C

A system for altering the lift/drag characteristics of powered aircraft to provide a safe means of glide path control includes a control device integrated for coordination action with the aircraft throttle. Such lift/drag alteration devices as spoilers, dive brakes, and the like are actuated by manual operation of a single lever coupled with the throttle for integrating, blending or coordinating power control. Improper operation of the controller is inhibited by safety mechanisms. Official Gazette of the U.S. Patent Office



06 AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

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

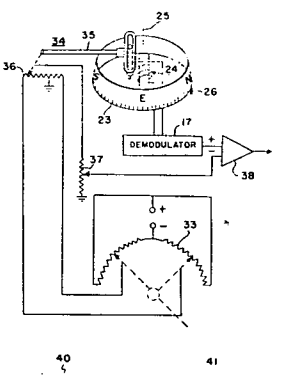
N75-12947*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

MAGNETIC HEADING REFERENCE Patent Application

Howell D. Garner, inventor (to NASA) Filed 11 Dec. 1974 23 p

(NASA-Case-LAR-11387-1; US-Patent-Appl-SN-531647) Avail: NTIS HC $3.25 CSCL 14B

The development and characteristics of a magnetometer which is used as a magnetic heading reference for small aircraft are discussed. In addition to providing a heading reference the device also corrects the output of the magnetometer to reduce the amount of northerly turning error. The inputs of the fluidic rate sensor and the rate bridge to the demodulator coils of the instrument are diagrammed. The application of the device to automatic pilots is analyzed. NASA



09 RESEARCH AND SUPPORT FACILITIES (AIR)

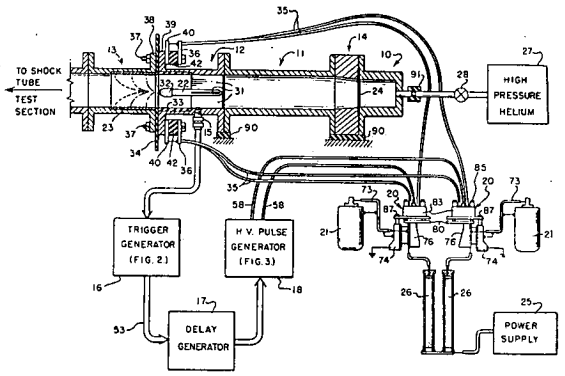
Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tube facilities; and engine test blocks.

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

N75-11997*# National Aeronautics and Space Administration. Pasadena Office, Calif.
ANNULAR ARC ACCELERATOR SHOCK TUBE Patent Application
Lewis P. Leibowitz, inventor (to NASA) (JPL) Filed 6 Nov. 1974 22 p
(Contract NAS7-100)
(NASA-Case-NPO-13528-1; US-Patent-Appl-SN-521620) Avail: NTIS HC $3.25 CSCL 14B

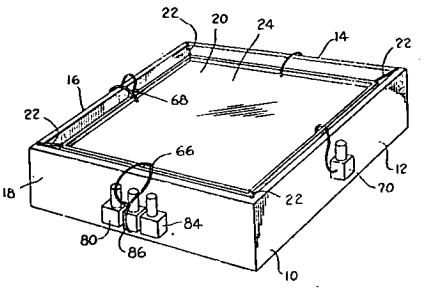
The development of an annular arc accelerator shock tube to study the effects of shock entry into planetary atmospheres is reported. A cold gas driver is employed by the shock tube to flow a stream of gas from an expansion section through a high voltage electrode section to a test section thus driving a shock wave in front of it. A glow discharge detects the shock wave and actuates a trigger generator which in turn fires spark-gap switches to discharge a bank of capacitors across a centered cathode and an annular anode in tandem electrode sections as the initial shock wave passes through the anode section from the cathode section thereby depositing energy into the flow gas without the necessity of any diaphragm opening in the gas flow from the expansion section through the electrode sections.

NASA



N75-12968* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AUTOMATICALLY OPERABLE SELF-LEVELING LOAD TABLE Patent
John L. Burch, inventor (to NASA) Issued 10 Dec. 1974 9 p Filed 8 Aug. 1973 Supersedes N73-30428 (11 - 21, p 2548)
(NASA-Case-MFS-22039-1; US-Patent-3,853,075;
US-Patent-Appl-SN-386790; US-Patent-Class-108-136) Avail: US Patent Office CSCL 14B

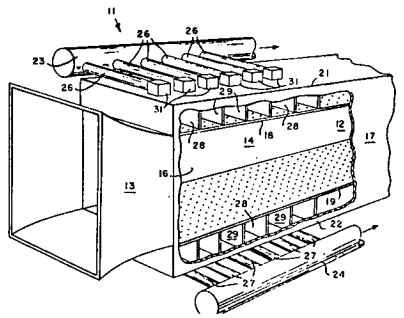
A self-leveling load table is described which is automatically maintained level by selectively opening and closing solenoid valves for inserting and removing air from chambers under the table. The table is floated in a fluid by nine air chambers beneath the top of the table. These chambers are open at the bottom and four oppositely located chambers are used for leveling the table by having the air increased or decreased by means of a flexible hose. Air bearing pendulums are used for selectively energizing solenoid valves which either apply pressurized air to the chamber or evacuate air from the chamber by means of a vacuum source. Official Gazette of the U.S. Patent Office



N75-12969* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
WIND TUNNEL FLOW GENERATION SECTION Patent
Norman E. Sorensen, inventor (to NASA) Issued 10 Dec. 1974 6 p Filed 13 Jul. 1973 Supersedes N73-27175 (11 - 18, p 125)
(NASA-Case-ARC-10710-1; US-Patent-3,853,003;
US-Patent-Appl-SN-379019; US-Patent-Class-73-147) Avail: US Patent Office CSCL 14B

A flow generation section for a wind tunnel test facility is described which provides a uniform flow for the wind tunnel test section over a range of different flow velocities. The throat of the flow generation section includes a pair of opposed boundary walls which are porous to the flowing medium in order to provide an increase of velocity by expansion. A plenum chamber is associated with the exterior side of each of such porous walls to separate the same from ambient pressure. A suction manifold is connected by suction lines with each one of the chambers. Valves are positioned in each of the lines to enable the suction manifold to be independently varied.

Official Gazette of the U.S. Patent Office

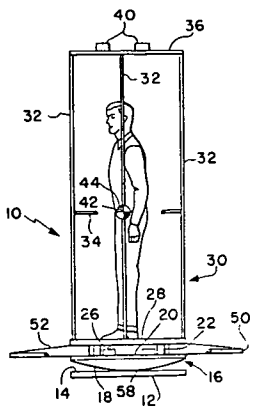


N75-15662* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
KINESTHETIC CONTROL SIMULATOR Patent
Paul R. Hill and David F. Thomas, Jr., inventors (to NASA) Issued 14 Jan. 1975 7 p Filed 20 Apr. 1970 Supersedes N70-26813 (08 - 13, p 2363)
(NASA-Case-LAR-10276-1; US-Patent-3,859,736;
US-Patent-Appl-SN-29979; US-Patent-Class-35-12C;
US-Patent-Class-272-1R; US-Patent-Class-272-57A) Avail: US Patent Office CSCL 14B

A kinesthetic control simulator is reported that has a flat base upon which rests a support structure having a lower spherical surface for rotation on the base plate with columns which support

a platform above the support structure at a desired location with respect to the center of curvature of the spherical surface. A handrail is at approximately the elevation of the hips of the operator above the platform with a ring attached to the support structure which may be used to limit the angle of tilt. Five degree freedom-of-motion can be obtained by utilizing an air pad structure for support of the control simulator.

Official Gazette of the U.S. Patent Office



15 LAUNCH VEHICLES AND SPACE VEHICLES

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

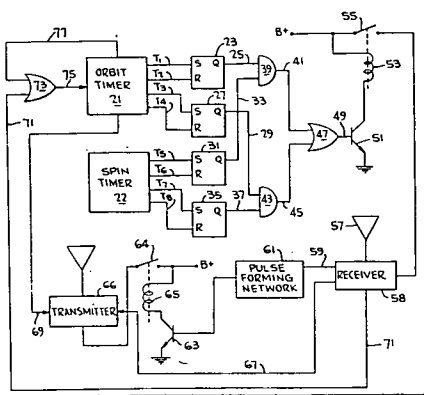
N75-13007* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

REMOTE PLATFORM POWER CONSERVING SYSTEM Patent

Charles W. Kurvin, inventor (to NASA) (Radiation, Inc., Melbourne, Fla.) Issued 26 Nov. 1974 9 p Filed 31 Aug. 1973 Supersedes N73-32769 (11 - 23, p 2849) Sponsored by NASA (NASA-Case-GSC-11182-1; US-Patent-3,851,250; US-Patent-Appl-SN-393527; US-Patent-Class-325-4) Avail: US Patent Office CSCL 22B

A system is described where an unattended receiver and transmitter equipped data collection platform is interrogated by a substantially polar orbiting satellite. The method and apparatus involve physically representing the orbit of the satellite and the spin of the planetary body with timers, and using these representations to turn on the platform's receiver only when the satellite should be in radio range of the platform, whereby battery power at the platform is conserved.

Official Gazette of the U.S. Patent Office



18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes spacecraft thermal and environmental control; and attitude control.

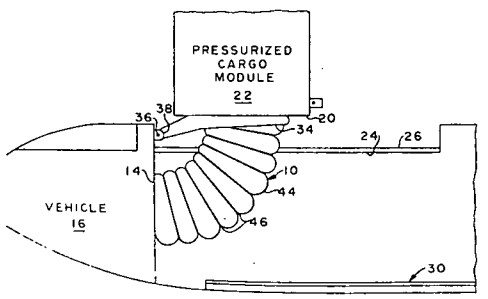
For life support systems see *54 Man/System Technology and Life Support*. For related information see also *05 Aircraft Design, Testing and Performance* and *39 Structural Mechanics*.

N75-14818*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

A DEPLOYABLE FLEXIBLE TUNNEL Patent Application

Newton D. Brown (Goodyear Aerospace Corp., Akron, Ohio), Gordon L. Jeppesen (Goodyear Aerospace Corp., Akron, Ohio), and Nicholas C. Costakos, inventors (to NASA) (Goodyear Aerospace Corp., Akron, Ohio) Filed 27 Dec. 1974 11 p Sponsored by NASA (NASA-Case-MFS-22636-1; US-Patent-Appl-SN-536762) Avail: NTIS HC $3.25 CSCL 22B

A pressurized flexible tunnel with equal length cables between the ends of the tunnel is described for use between two vehicles in outer space. The cables are lengthened or shortened by a single winch. The tunnel may be expanded or contracted as required by externally positioned orienting means. NASA



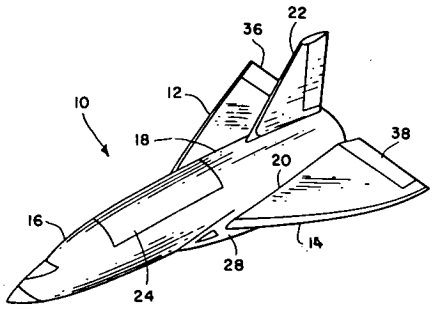
N75-16613*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

VARIABLE DIHEDRAL SHUTTLE ORBITER Patent Application

Bernard Spencer, Jr., John W. Wilkey, Jr., and Beverly Z. Henry, Jr., inventors (to NASA) Filed 11 Feb. 1975 10 p (NASA-Case-LAR-10706-1; US-Patent-Appl-SN-549239) Avail: NTIS HC $3.25 CSCL 22B

An aircraft configuration is described which yields efficient flight at both subsonic and hypersonic speeds and which permits the wings to be protected from the hostile heat environment of orbital reentry. The essential feature is a variable dihedral wing which may be folded out during flight to adjust the aircraft's flight characteristic as the speed decreases. During hypersonic flight the wings are folded upright against the fuselage, while

for the lowest speed operation the wings are fully extended in a horizontal manner. Intermediate positions of extension are used for intermediate speed ranges. NASA



N75-19329* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

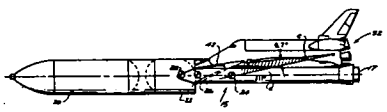
SPACE VEHICLE Patent

George L. VonPragenau, inventor (to NASA) Issued 18 Feb. 1975 7 p Filed 21 Mar. 1974 Supersedes N74-20541 (12 - 11, p 1355)

(NASA-Case-MFS-22734-1; US-Patent-3,866,863; US-Patent-Appl-SN-453232; US-Patent-Class-244-162) Avail: US Patent Office CSCL 22B

A space vehicle having an improved ascent configuration for use in traveling in space is presented. Components of the vehicle are: (1) a winged orbiter having an elongater fuselage and rearwardly directed main engines fixed to the fuselage; (2) an elongated tank assembly of an improved configuration disposed forwardly of the fuselage and connected with the main engines of the vehicle for supplying liquid propellants; and (3) a booster stage comprising a pair of integrated solid rocket boosters connected with the orbiter immediately beneath the fuselage and extended in substantial parallelism.

Official Gazette of the U.S. Patent Office



20 SPACECRAFT PROPULSION AND POWER

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

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

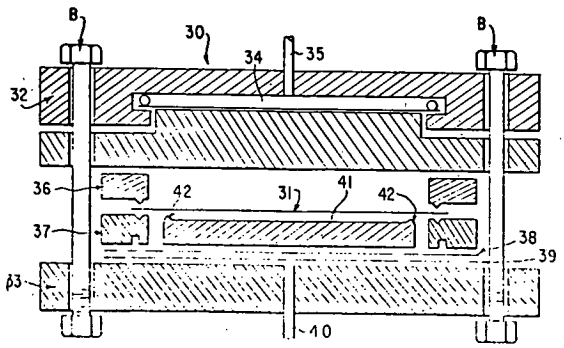
N75-16624*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

METHOD OF CONSTRUCTING DISHED ION THRUSTER GRIDS TO PROVIDE HOLE ARRAYS SPACING COMPENSATION Patent Application

Bruce A. Banks, inventor (to NASA) Filed 20 Jan. 1975 12 p

(NASA-Case-LEW-11876-1; US-Patent-Appl-SN-542157) Avail: NTIS HC $3.25 CSCL 21C

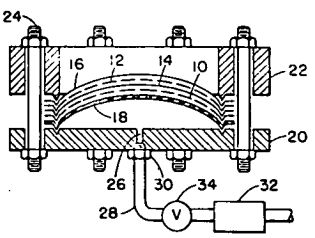
Hydroforming matched grids for an accelerator system of an ion thruster is described. The accelerator grid is stretched prior to hydroforming so that the center-to-center spacing of the whole array in the accelerator grid is larger than the screen grid. Stretching of the accelerator grid is done in a manner that uniformly stretches the grid in all directions in the plane of the grid. The center-to-center spacings of a photoresist pattern for an array of holes applied to a thin metal sheet are increased by uniformly stretching the thin metal sheet in all directions along the plane of the sheet. The uniform stretching is provided by securely clamping the periphery of the sheet and applying an annular force against the face of the sheet, within the periphery of the sheet and around the photoresist pattern. The technique is used in the construction of ion thruster grid units wherein the outer or downstream grid is subjected to uniform stretching prior to convex molding. The technique provides alignment of the holes of grid pairs so as to direct the ion beamlets in a direction parallel to the axis of the grid unit and thereby provide optimization of the available thrust. NASA



N75-18310* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD OF MAKING DISHED ION THRUSTER GRIDS Patent
Bruce A. Banks, inventor (to NASA) Issued 11 Feb. 1975 5 p Filed 18 Apr. 1973 Supersedes N73-22721 (11 - 13, p 1570)
(NASA-Case-LEW-11694-1; US-Patent-3,864,797; US-Patent-Appl-SN-352381; US-Patent-Class-29-25.18; US-Patent-Class-72-63) Avail: US Patent Office CSCL 21C

A pair of flat grid blanks are clamped together at their edges with an impervious metal sheet on top. All of the blanks and sheets are dished simultaneously by forcing fluid to inflate an elastic sheet which contacts the bottom grid blank. A second impervious metal sheet is inserted between the two grid blanks if the grids have high percentage open areas. The dished grids are stress relieved simultaneously.

Official Gazette of the U.S. Patent Office



23 CHEMISTRY AND MATERIALS (GENERAL)

Includes biochemistry and organic chemistry.

N75-14834* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
ANTI-FOG COMPOSITION Patent
Harry D. Morrison (Brown and Root-Northrop) and Dorrie L. Carmin, Jr., inventors (to NASA) (Brown and Root-Northrop) Issued 24 Dec. 1974 7 p Filed 8 Sep. 1971 Supersedes N73-11107 (11 - 02, p 0137) Continuation-in part of abandoned US Patent Appl. SN-69488, filed 3 Sep. 1970 Sponsored by NASA
(NASA-Case-MSC-13530-2; US-Patent-3,856,534; US-Patent-Appl-SN-178771; US-Patent-Class-106-13; US-Patent-Class-106-15R; US-Patent-Class-106-287SB; US-Patent-Class-117-124F; US-Patent-Class-117-135.5; US-Patent-Class-252-70; US-Patent-Class-252-549; US-Patent-Appl-SN-69488) Avail: US Patent Office

An anti-fog composition is described for the prevention of fogging on surfaces such as space helmet visors, spacecraft windows, and windshields. It is composed of a surface active agent, water, and an oil time extender.

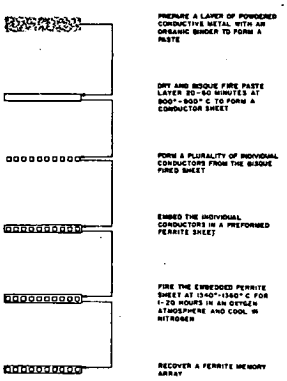
Official Gazette of the U.S. Patent Office

24 COMPOSITE MATERIALS

Includes laminates.

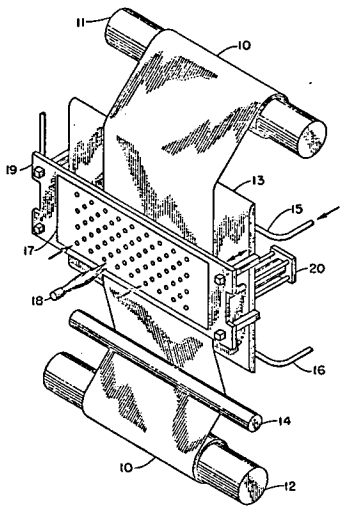
N75-13032* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
METHOD FOR MAKING CONDUCTORS FOR FERRITE MEMORY ARRAYS Patent
Clarence H. Heckler (Ampex Corp.), Paul D. Baba (Ampex Corp.), and Nutan C. Bhiwandker, inventors (to NASA) (Ampex Corp.) Issued 26 Nov. 1974 6 p Filed 22 Aug. 1973 Supersedes N73-30536 (11 - 21, p 2562) Sponsored by NASA
(NASA-Case-LAR-10994-1; US-Patent-3,849,877; US-Patent-Appl-SN-390466; US-Patent-Class-29-604; US-Patent-Class-29-420; US-Patent-Class-75-200; US-Patent-Class-340-174MA) Avail: US Patent Office CSCL 11D

The ferrite memory arrays are made from pre-formed metal conductors for the ferrite arrays. The conductors are made by forming a thin sheet of a metallizing paste of metal alloy powder, drying the paste layer, bisque firing the dried sheet at a first temperature, and then punching the conductors from the fired sheet. During the bisque firing, the conductor sheet shrinks to 58 percent of its pre-fired volume and the alloy particles sinter together. The conductors are embedded in ferrite sheet material and finally fired at a second higher temperature during which firing the conductors shrink approximately the same degree as the ferrite material. Official Gazette of the U.S. Patent Office



N75-14839*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
INSULATION FOIL AND METHOD OF MAKING Patent Application
Edward A. Maslowski, inventor (to NASA) Filed 11 Dec. 1974 10 p
(NASA-Case-LEW-11484-2; US-Patent-Appl-SN-531568) Avail: NTIS HC $3.25 CSCL 11D

A method for fabricating multi-foil insulation systems is described. Metal foils with protuberances which are capped with ceramic coatings are produced by the method. The coated protuberances provide spacing between the foils, while the ceramic coatings serve as thermal barriers to metallic heat conduction between the foils. Diagrams of the fabricating equipment and the resulting product are developed. NASA

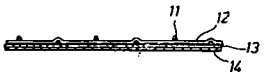


N75-15746*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
BEARING MATERIAL Patent Application
Harold E. Sliney, inventor (to NASA) Filed 10 Oct. 1974 27 p
(NASA-Case-LEW-11930-1; US-Patent-Appl-SN-513611) Avail: NTIS HC $3.75 CSCL 11D

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

N75-16635*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
LIGHTWEIGHT ELECTRICALLY POWERED FLEXIBLE THERMAL LAMINATE Patent Application
Frederic S. Dawn and Dale G. Sauers, inventors (to NASA) Filed 14 Jan. 1975 8 p
(NASA-Case-MSC-12662-1; US-Patent-Appl-SN-540779) Avail: NTIS HC $3.25 CSCL 11D

A lightweight flexible laminate structure for providing controlled heating is described. It is composed of filling yarns and warp-yarns which are preferably interwoven. The filling strands are electrically nonconductive multifilament yarns, and the warp-yarns are composed of electrically conductive metal filaments or fibers which can be resistance heated by the application of an electrical voltage. The nonconductive yarns provide mechanical strength and preclude the passage of electrical current between metal yarns by assuring minimum spacing. A plastic film is bonded to the matrix of the yarns and performs the function of providing additional strength and preventing connective loss of heat in a nonvacuum application. A metallic film of aluminum, silver, or gold is deposited on the obverse side of the film relative to the matrix and provides uniform heat load distribution. Author



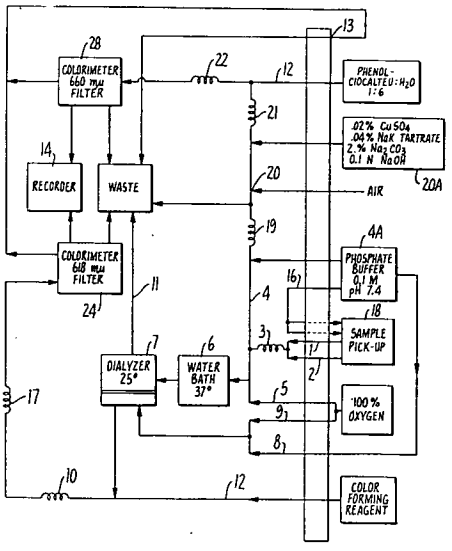
25 INORGANIC AND PHYSICAL CHEMISTRY

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

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

N75-12086* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AUTOMATED ANALYSIS OF OXIDATIVE METABOLITES Patent
Raymond L. Furner, inventor (to NASA) (NAS-NRC) Issued 5 Nov. 1974 7 p Filed 18 Aug. 1972 Supersedes N72-31145 (10 - 22, p 2927) Sponsored by NASA
(NASA-Case-ARC-10469-1; US-Patent-3,846,243; US-Patent-Appl-SN-281908; US-Patent-Class-195-103.5R) Avail: US Patent Office CSCL 07D

An automated system for the study of drug metabolism is described. The system monitors the oxidative metabolites of aromatic amines and of compounds which produce formaldehyde on oxidative dealkylation. It includes color developing compositions suitable for detecting hyroxylated aromatic amines and formaldehyde. Official Gazette of the U.S. Patent Office



N75-12087* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

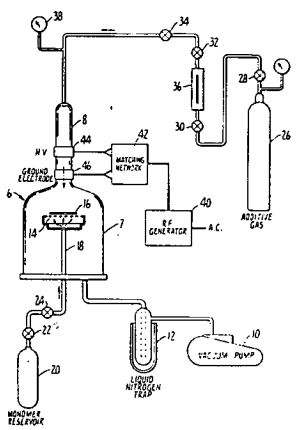
METHOD OF PREPARING WATER PURIFICATION MEMBRANES Patent

John R. Hollahan (NAS-NRC) and Theodore Wydeven, inventors (to NASA) (NAS-NRC) Issued 12 Nov. 1974 6 p Filed 8 Dec. 1972 Supersedes N73-29074 (11 - 20, p 2374) Sponsored by NASA

(NASA-Case-ARC-10643-1; US-Patent-3,847,652; US-Patent-Appl-SN-513389; US-Patent-Class-117-93.1GD; US-Patent-Class-117-161UA; US-Patent-Class-117-161UN; US-Patent-Class-117-161UZ; US-Patent-Class-204-177; US-Patent-Class-210-500; US-Patent-Class-264-22; US-Patent-Class-264-217) Avail: US Patent Office CSCL 07D

Allyl amine and chemically related compounds are polymerized as thin films in the presence of a plasma discharge. The monomer compound can be polymerized by itself or in the presence of an additive gas to promote polymerization and act as a carrier. The polymerized films thus produced show outstanding advantages when used as reverse osmosis membranes.

Official Gazette of the U.S. Patent Office



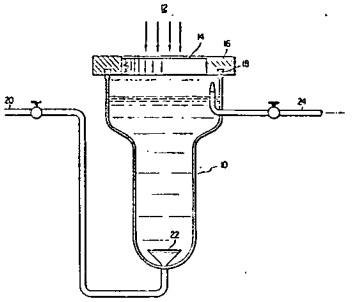
N75-13053*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

PROCESS FOR MAKING ANHYDROUS METAL HALIDES Patent Application

Warren H. Philipp, Stanley J. Marsik, and Charles E. May, inventors (to NASA) Filed 27 Nov. 1974 15 p

(NASA-Case-LEW-11860-1; US-Patent-Appl-SN-527728) Avail: NTIS HC $3.25 CSCL 07D

A process for the preparation and isolation of high purity anhydrous lower valence state metal halides using high energy radiation is reported. The process involves dissolving the corresponding higher valence state metal halide of the desired lower valence state metal halide in an organic liquid, which is selected such that the higher valence state metal halide is soluble and the lower valence state metal halide is insoluble. The solution is subjected to high energy radiation which reduces the higher valence state metal halide to its corresponding lower valence state metal halide, at a temperature in the range of from about 0 C. to about room temperature. NASA



N75-13054*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

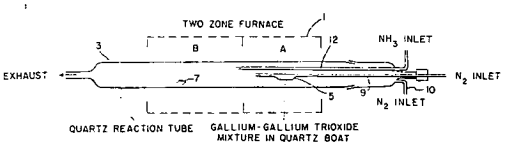
GROWTH OF GALLIUM NITRIDE CRYSTALS Patent Application

Ting L. Chu, inventor (to NASA) (Southern Methodist Univ.) Filed 5 Nov. 1974 10 p Sponsored by NASA

(NASA-Case-LAR-11302-1; US-Patent-Appl-SN-521007) Avail: NTIS HC $3.25 CSCL 20B

Bulk gallium nitride single crystals are grown by subjecting in the vapor phase, ammonia and a gallium compound selected from the group consisting of gallium trioxide and gallium monochloride, to a reaction temperature in a reaction vessel.

NASA



N75-14844* National Aeronautics and Space Administration, Pasadena Office, Calif.

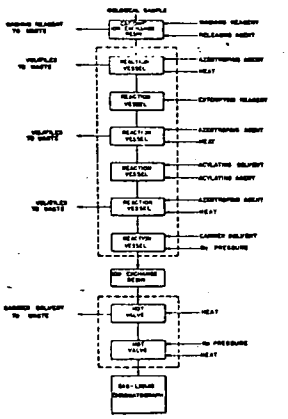
AMINO ACID ANALYSIS Patent

Milton Winitz (Vivonex Corp., Mountain View, Calif.) and Jack Graff, inventors (to NASA) (Vivonex Corp., Mountain View, Calif.) Issued 24 Dec. 1974 8 p Filed 5 Aug. 1968 Sponsored by NASA

(NASA-Case-NPO-12130-1; US-Patent-3,856,471; US-Patent-Appl-SN-750235; US-Patent-Class-23-253R; US-Patent-Class-23-230B) Avail: US Patent Office CSCL 07D

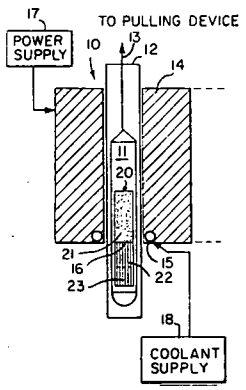
The process and apparatus for qualitative and quantitative analysis of the amino acid content of a biological sample are presented. The sample is deposited on a cation exchange resin and then is washed with suitable solvents. The amino acids and various cations and organic material with a basic function remain on the resin. The resin is eluted with an acid eluant, and the eluate containing the amino acids is transferred to a reaction

vessel where the eluant is removed. Final analysis of the purified acylated amino acid esters is accomplished by gas-liquid chromatographic techniques.
Official Gazette of the U.S. Patent Office



N75-19380*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD OF GROWING COMPOSITES OF THE TYPE EXHIBITING THE SORET EFFECT Patent Application
Biliyar N. Bhat, inventor (to NASA) (NRC) Filed 11 Mar. 1975 17 p Sponsored by NASA
(NASA-Case-MFS-22926-1; US-Patent-Appl-SN-557565) Avail: NTIS HC $3.25 CSCL 20B

A method is described to improve the structure and homogeneity of eutectic materials and single crystals. A predetermined amount of segregation is introduced into a molten sample of a composite that exhibits the Soret effect, such amount approximating the amount of segregation resulting from directional solidification of the sample. The molten sample is then directionally solidified starting at the end opposite the end richer in the constituent that would migrate toward the cooler part of a liquid solution of the composite maintained in a temperature gradient. Since solidification commences at the end deficient in such constituent, its migration toward the interface between the solid and liquid during the solidification will compensate for the deficiency. A homogeneous solidification product that is well suited to the production of high temperature eutectic composites, fiber optic strands, and electronic materials is produced. NASA

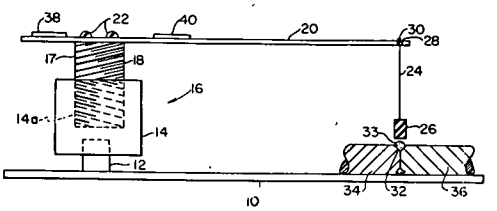


26 METALLIC MATERIALS

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

N75-10210*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
APPARATUS FOR MEASURING THE FERRITE CONTENT OF AUSTENITIC STAINLESS STEEL WELD MATERIAL Patent Application
Wayman N. Clotfelter and Benjamin F. Bankston, inventors (to NASA) Filed 29 Oct. 1974 13 p
(NASA-Case-MFS-22907-1; US-Patent-Appl-SN-518546) Avail: NTIS HC $3.25 CSCL 11F

A device is provided for measuring the ferrite content of austenitic stainless steel weld material. The device includes a base plate for rotatably mounting a mechanical vernier member; the mechanical vernier member supports a cantilever beam in a manner to provide vertical positioning of the beam. Suspended from the free end of the beam is a permanent magnet below which is positioned the specimen of austenitic weld material which is to be tested. Strain gauges are provided on the top surface of the beam for measuring the magnetic force between the magnet and weld material by measuring the amount of downward deflection of the beam. The measurement is then converted into a reading which indicates the percentage of ferrite of the weld material in the joint. NASA



N75-19408* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DUPLEX ALUMINIZED COATINGS Patent
Michael A. Gedwill and Salvatore J. Grisaffe, inventors (to NASA) Issued 11 Mar. 1975 4 p Filed 24 Jan. 1974 Supersedes N74-18197 (12 - 09, p 1063) Continuation-in-part of US Patent Appl. SN-298156, filed 16 Oct. 1972
(NASA-Case-LEW-11696-2; US-Patent-3,869,779; US-Patent-Appl-SN-436315; US-Patent-Class-29-194; US-Patent-Class-29-196.2; US-Patent-Class-29-196.6; US-Patent-Class-29-197; US-Patent-Appl-SN-298156) Avail: US Patent Office CSCL 11C

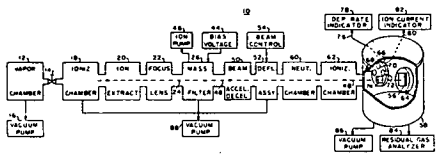
The surface of a metallic base system is initially coated with a metallic alloy layer that is ductile and oxidation resistant. An aluminide coating is then applied to the metallic alloy layer. The chemistry of the metallic alloy layer is such that the oxidation resistance of the subsequently aluminized outermost layer is not seriously degraded. Official Gazette of the U.S. Patent Office

31 ENGINEERING (GENERAL)

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

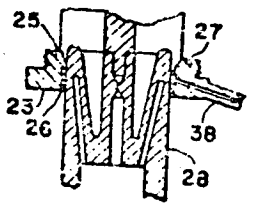
N75-12161* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SYSTEM FOR DEPOSITING THIN FILMS Patent
Philip W. Tashbar, inventor (to NASA) Issued 12 Nov. 1974 6 p Filed 2 May 1973 Supersedes N73-23770 (11 - 14, p 1697)
(NASA-Case-MFS-20775-1; US-Patent-3,847,115; US-Patent-Appl-SN-356664; US-Patent-Class-118-49.1) Avail: US Patent Office CSCL 13H

A system for depositing a thin film of one material on another is described. A mass filter is interposed between the source of material being deposited and the object upon which deposition is being made. Official Gazette of the U.S. Patent Office



N75-13111* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EVACUATED, DISPLACEMENT COMPRESSION MOLD Patent
Wilbur C. Heier, inventor (to NASA) Issued 26 Nov. 1974 9 p Filed 13 Jul. 1973 Supersedes N73-31444 (11 - 22, p 2677) Continuation-in-part of US Patent Appl. SN-197689, filed 11 Nov. 1971
(NASA-Case-LAR-10782-2; US-Patent-3,850,567; US-Patent-Appl-SN-379049; US-Patent-Class-425-405R; US-Patent-Class-425-438; US-Patent-Class-425-468; US-Patent-Class-249-59; US-Patent-Class-249-144; US-Patent-Class-249-145; US-Patent-Class-425-DIG.43; US-Patent-Appl-SN-197689) Avail: US Patent Office CSCL 13I

A process of molding long thin-wall tubular bodies from thermosetting plastic molding compounds is described wherein the tubular body lengths may be several times the diameters. The process is accomplished by loading a predetermined quantity of molding compound into a female mold cavity closed at one end by a force mandrel. After closing the other end of the female mold with a balance mandrel, the loaded cavity is evacuated by applying a vacuum of from one-to-five mm pressure for a period of fifteen-to-thirty minutes. The mold temperature is raised to the minimum temperature at which the resin constituent of the compound will soften or plasticize and a pressure of 2500 psi is applied. Official Gazette of the U.S. Patent Office



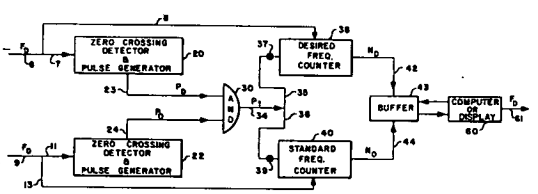
32 COMMUNICATIONS

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.*

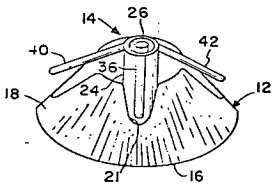
N75-13124*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
FINE FREQUENCY MEASUREMENT BY COINCIDENCE DETECTION Patent Application
Edward Nossen (RCA) and Eugene Richard Starner, inventors (to NASA) (RCA) Filed 13 Sep. 1974 10 p
(Contract NAS9-13517)
(NASA-Case-MSC-14649-1; US-Patent-Appl-SN-505819) Avail: NTIS HC $3.25 CSCL 17B

A method of measuring a desired frequency by comparing it with a standard frequency is reported. The zero crossings of both frequencies are detected. A command pulse is generated at each coincidence and is used to start and stop a pair of frequency counters adapted to count the desired and standard frequencies. A measure of the desired frequency is obtained by multiplying the known standard frequency by the ratio between the desired count and the standard count obtained in the two frequency counters. NASA



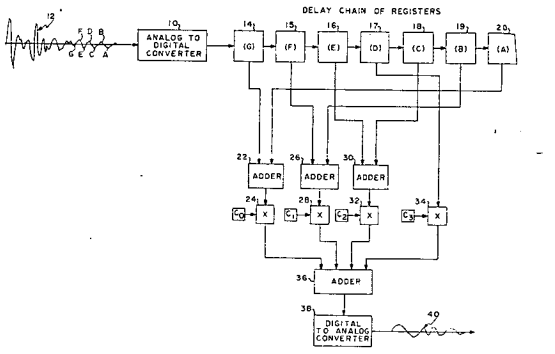
N75-13125*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
TURNSTILE AND FLARED CONE UHF ANTENNA Patent Application
Donald J. Bottoms (Martin Marietta Corp.) and Theofanis G. Gavrillis, inventors (to NASA) (Martin Marietta Corp.) Filed 27 Nov. 1974 10 p
(Contract NAS1-9000)
(NASA-Case-LAR-10970-1; US-Patent-Appl-SN-527790) Avail: NTIS HC $3.25 CSCL 17B

An apparatus is described for improving the broad beamwidth characteristics of a turnstile-cup antenna by the use of a truncated cone to replace the conventional cup and by tilting the turnstile arms back toward the base of the cone. The basic invention consists of a truncated cone with slots, turnstile antenna with feed support, and antenna arms tilted back toward the cone base. Directly below and in alinement with each antenna arm is a slot cut into the cone sides, which aids the broad beamwidth characteristics by the parasitic coupling between the antenna arms and the slots. This antenna yields considerably greater beamwidth than the more conventional antennas. Such increased beamwidth gives the antenna, which was used in the Viking altimeter system, relative independence from changes in antenna orientation.
NASA



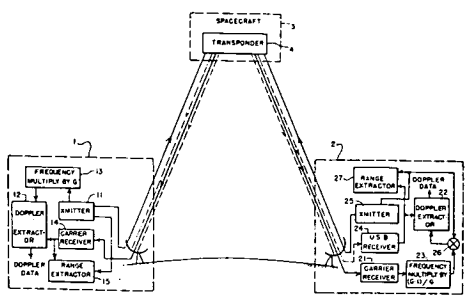
N75-14011*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
FILTERING DEVICE Patent Application
Thomas R. Edwards and Hugh W. Zeanah, inventors (to NASA) Filed 17 Dec. 1974 9 p
(NASA-Case-MFS-22729-1; US-Patent-Appl-SN-533608) Avail: NTIS HC $3.25 CSCL 17B

An electrical filter is described for removing noise from voice communications signals. Filtering is accomplished by adding balanced, with respect to a midpoint sample, spaced pairs of the sampled signal values, and then multiplying each pair by a selected filter constant. The signal products thus obtained are summed to provide a filtered version of the original signal.
NASA



N75-15854* National Aeronautics and Space Administration. Pasadena Office, Calif.
SIMULTANEOUS ACQUISITION OF TRACKING DATA FROM TWO STATIONS Patent
Gordon E. Wood, inventor (to NASA) (JPL) Issued 14 Jan. 1975 8 p Filed 15 Nov. 1973 Supersedes N74-15838 (12 07, p 0760) Sponsored by NASA
(NASA-Case-NPO-13292-1; US-Patent-3,860,921; US-Patent-Appl-SN-416135; US-Patent-Class-343-6.5R; US-Patent-Class-343-9; US-Patent-Class-343-17.5; US-Patent-Class-343-100ST) Avail: US Patent Office CSCL 17B

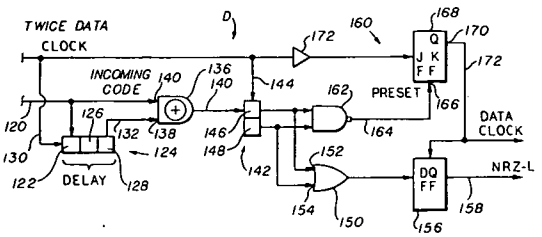
A method and apparatus is described for obtaining simultaneous tracking data from two ground stations relative to a spacecraft, and in particular for obtaining two-way range and Doppler measurements with respect to the spacecraft using only one transponder on the spacecraft. The technique employs simultaneous transmission from two stations to produce a return signal with upper and lower sidebands resulting from the interference of the two transmissions. A transponder transmits the upper and lower sidebands centered about a carrier received by both stations. One station tracks the carrier and the other tracks a sideband aided by the carrier.
Offical Gazette of the U.S. Patent Office



N75-19480*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
DIFFERENTIAL PULSE CODE MODULATION Patent Application
Calvin F. Herman, inventor (to NASA) Filed 29 Jan. 1975 25 p
(NASA-Case-MSC-12506-1; US-Patent-Appl-SN-545283) Avail: NTIS HC $3.25 CSCL 17B

A differential pulse code modulation encoding and decoding method and apparatus is presented which is capable of transmission with minimum bandwidth, is not affected by data transition density, requires no direct current response of the transmission link, and suffers from minimal ambiguity in resolution of the digital data. Digital data present in a succession of data bit intervals are differentially encoded so that the information is transmitted as a differential change or lack of change of state of data levels at bit time transition points during successive data bit intervals. The data to be sent are encoded by causing a transition in signal level changes between successive bit time transition points during successive data bit intervals in response to a first digital data level, which may be either digital '1' or digital '0' in the digital data being encoded. When the alternate digital data level from the first digital data level is present in

the data being encoded, no transition in signal level changes between successive bit time transition points is present. The data so encoded is transmitted, received, and decoded in a decoder. NASA



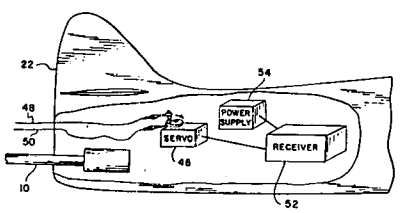
33 ELECTRONICS AND ELECTRICAL ENGINEERING

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*.

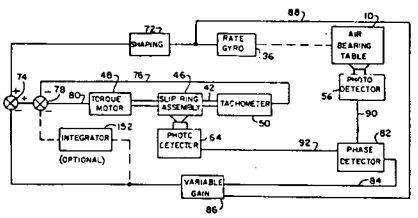
N75-12195*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
DEPLOY/RELEASE SYSTEM Patent Application
David B. Robelen, inventor (to NASA) Filed 27 Nov. 1974 12 p
(NASA-Case-LAR-11575-1; US-Patent-Appl-SN-527727) Avail: NTIS HC $3.25 CSCL 09C

An apparatus is described for arresting uncontrollable motions of model aircraft. A remotely transmitted signal is used to deploy a parachute and after the model aircraft motions are stabilized, a second signal is transmitted which jettisons the parachute and normal flight resumed. The deploy and jettison signals may be sent using a single channel of a multi-channel transmitter and are completely independent of each other. NASA



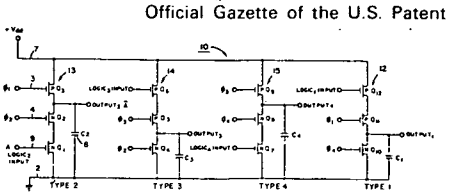
N75-13139* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PHASE-LOCKED SERVO SYSTEM Patent
Clifford Burdin, inventor (to NASA) (McDonnell-Douglas Corp., Huntington Beach, Calif.) Issued 26 Nov. 1974 8 p Filed 26 Oct. 1973 Supersedes N74-11058 (12 - 02, p 0140) Sponsored by NASA
(NASA-Case-MFS-22073-1; US-Patent-3,851,238; US-Patent-Appl-SN-409991; US-Patent-Class-318-649; US-Patent-Class-318-608; US-Patent-Class-318-640; US-Patent-Class-318-675) Avail: US Patent Office CSCL 09A

A phase lock servo system is described for synchronizing the rotation of a slip ring assembly with the rotation of an air bearing table so that a minimum of torque will be imparted through cables extending from the slip ring assembly to the air bearing table as such is rotated. The system includes two servo loops. The first servo loop includes a rate gyroscope carried on the air bearing table which generates a signal through a summing junction to be compared with a signal coming from a tachometer coupled to the slip ring assembly. The corrective signal is applied to a torque motor for rotating the slip ring assembly. The second servo loop includes a pair of photo detector cells which generate pulses responsive to the rotation of the air bearing table and slip ring assembly which are fed through a phase detector, and a variable gain amplifier to the summing junction circuit to provide a fine adjustment for rotating the slip ring assembly.
Official Gazette of the U.S. Patent Office



N75-14957* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
FOUR PHASE LOGIC SYSTEMS Patent
Howard L. Petersen (Lockheed Missiles and Space Co., Sunnyvale, Calif.) and Donald K. Kinell, inventors (to NASA) (Lockheed Missiles and Space Co., Sunnyvale, Calif.) Issued 24 Dec. 1974 7 p Filed 17 Apr. 1973 Supersedes N73-21240 (11 - 12, p 1386) Sponsored by NASA
(NASA-Case-MSC-14240-1; US-Patent-3,857,045; US-Patent-Appl-SN-351929; US-Patent-Class-307-208; US-Patent-Class-307-205) Avail: US Patent Office CSCL 09C

A four-phase logic system is provided which includes at least four logic networks connected in parallel between a single power line and a reference potential. A four-phase clock generator generates four distinct clock signals from a single-phase clock input at data rate. Each logic network comprises a pair of complementary metal-oxide-semiconductor integrated transistors (CMOST). Each metal-oxide-Semiconductor transistor (MOST) in the pair is responsive to a clock signal which turns the transistor on or off. In each network, there is also at least one MOST which is responsive to a logic signal. The logic transistor is connected in cascade with the pair of CMOSTs.
Official Gazette of the U.S. Patent Office



N75-14964*# National Aeronautics and Space Administration. Pasadena Office, Calif.

HIGHLY EFFICIENT ANTENNA SYSTEM USING A CORRUGATED HORN AND SCANNING HYPERBOLOID REFLECTOR Patent Application

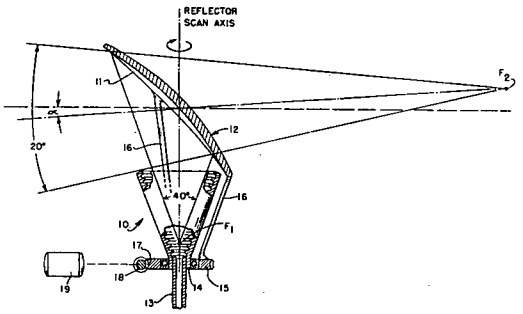
Kenneth A. Green, inventor (to NASA) (Microwave Res. Corp.) Filed 19 Dec. 1974 16 p Sponsored by NASA Prepared for JPL

(Contracts NAS7-100; JPL-953409)

(NASA-Case-NPO-13568-1; US-Patent-Appl-SN-534265) Avail: NTIS HC $3.25 CSCL 09E

The characteristics of a horn-reflector antenna system for producing a beam of high efficiency with a spherical aperture phase front and side lobes. A diagram of the antenna is provided to show the antenna construction. The system is insensitive to frequency and polarization changes, and is also insensitive to orientation about the axis of the conical horn for beam scanning. The improved antenna radiation pattern is applicable to communication systems and radar systems requiring low noise.

NASA



N75-15874* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

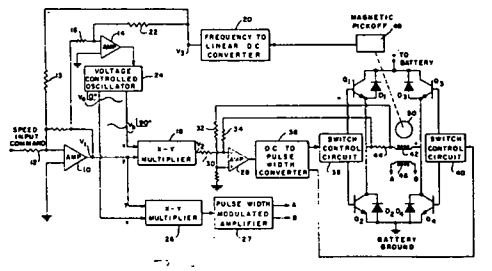
VARIABLE FREQUENCY INVERTER FOR ac INDUCTION MOTORS WITH TORQUE, SPEED AND BRAKING CONTROL Patent

Frank J. Nola, inventor (to NASA) Issued 14 Jan. 1975 6 p Filed 19 Dec. 1973 Supersedes N74-13894 (12 - 05, p 0510)

(NASA-Case-MFS-22088-1; US-Patent-3,860,858; US-Patent-Appl-SN-426155; US-Patent-Class-318-227; US-Patent-Class-318-230; US-Patent-Class-318-231) Avail: US Patent Office CSCL 09E

A variable frequency inverter was designed for driving an ac induction motor which varies the frequency and voltage to the motor windings in response to varying torque requirements for the motor so that the applied voltage amplitude and frequency are of optimal value for any motor load and speed requirement. The slip frequency of the motor is caused to vary proportionally to the torque and feedback is provided so that the most efficient operating voltage is applied to the motor. Winding current surge is limited and a controlled negative slip causes motor braking and return of load energy to a dc power source.

Official Gazette of the U.S. Patent Office



N75-15876*# National Aeronautics and Space Administration. Pasadena Office, Calif.

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

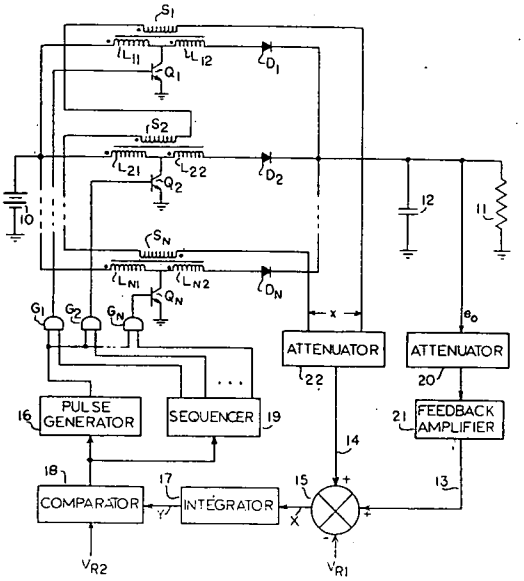
Gene W. Wester, inventor (to NASA) (JPL) Filed 17 Dec. 1974 15 p

(Contract NAS7-100)

(NASA-Case-NPO-13512-1; US-Patent-Appl-SN-533734) Avail: NTIS HC $3.25 CSCL 09C

Boost, buck and buck-boost dc-to-dc converters are described that employ parallel staggered-phase power switches with two-loop control. A switched inductor voltage is coupled to a sense winding in each phase, and all sense windings are connected in series to one of two feedback loops to provide a signal that indicates when one of the power switches is on as the principal determinant of switching instants. A sequencer is triggered each time a pulse generator is triggered to turn on a different power switch in sequence at each switching instant.

NASA



N75-16745*# National Aeronautics and Space Administration. Pasadena Office, Calif.

THE 3-5 PHOTOCATHODE WITH NITROGEN DOPING FOR INCREASED QUANTUM EFFICIENCY Patent Application

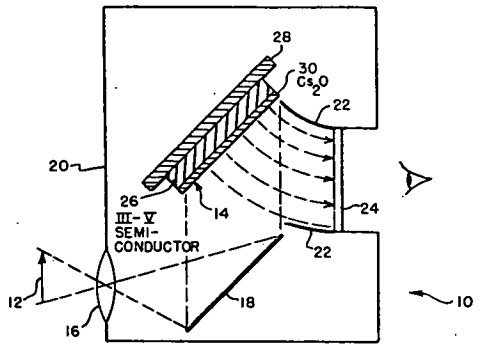
Lawrence W. James, inventor (to NASA) (Varian Assoc.) Filed 27 Dec. 1974 26 p Sponsored by NASA

(Contract DOT-TSC-95)

(NASA-Case-NPO-12134-1; US-Patent-Appl-SN-536785) Avail: NTIS HC $3.75 CSCL 09C

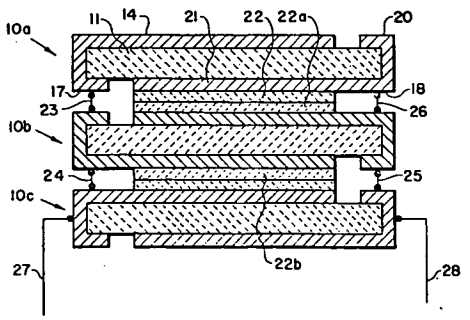
Photocathodes are described which improve quantum efficiency by increasing the product of the optical absorption coefficient and the diffusion length of the below-bandgap absorption, without an offsetting reduction in escape probability. The photocathode is supported on a conductive electrode in an infrared image intensifier tube and is made of 3-5 semiconductor material doped with an acceptor and nitrogen, a column-5 isoelectronic element. This produces a spatially localized energy level at just below the conduction band similar to a donor level at which optical transitions can occur, thus increasing the absorption coefficient without compensation of the acceptor

dopant. It was found that a suitable activation layer on the electron emission surface of the semiconductor material lowers the work function of the photocathode. Emitted electrons are accelerated by a relatively high voltage applied via accelerating electrodes, and focused onto a fluorescent screen. NASA



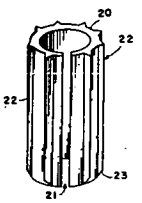
N75-16746*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HIGH TEMPERATURE CAPACITOR Patent Application
Russell A. Lindberg, inventor (to NASA) Filed 28 Jan. 1975 9 p
(NASA-Case-LEW-11938-1; US-Patent-Appl-SN-544611) Avail: NTIS HC $3.25 CSCL 09A

A capacitor is described which can be used in environments where the temperature is as high as 1500 C (2732 F). The capacitor comprises a dielectric platelet of BeO which has radially extending tabs. Electrodes of iridium having no more than 10 parts per million (ppm) of oxygen and preferably less than 1 ppm are bonded to the platelet and include end portions which provide contacts. These contacts provide electrical connections when a plurality of capacitors are stacked to obtain increased capacitance. The attachment of the electrodes to the dielectric platelet is achieved by off-sputtering the surfaces of the platelet to obtain a surface texture ratio. The electrodes are then deposited by sputtering procedures to a thickness of 2500 to 4000 angstroms. NASA



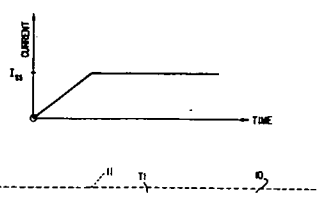
N75-16747*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
CONNECTOR Patent Application
Donald E. Pizzeck, inventor (to NASA) Filed 10 Feb. 1975 7 p
(NASA-Case-LAR-11709-1; US-Patent-Appl-SN-548468) Avail: NTIS HC $3.25 CSCL 09A

A connector is described for connecting circuits on different layers of a multilayer printed circuit board through a hole in the board. The connector is a hollow cylindrical conductor made from a resilient material such as beryllium copper or spring steel. A slit in the conductor and a plurality of sharp teeth located on the outside of the conductor extend the full length of the conductor. The conductor has a slightly larger outside diameter than the diameter of the hole. It was found that when the connector is forced into the hole, the springback (resiliency) of the connector forces the teeth against the circuits on the printed circuit board and provides a positive connection between the circuits. NASA



N75-16748*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
INRUSH CURRENT LIMITER Patent Application
Robert A. Kichak, inventor (to NASA) Filed 6 Jan. 1975 16 p
(NASA-Case-GSC-11789-1; US-Patent-Appl-SN-538982) Avail: NTIS HC $3.25 CSCL 09E

A control circuit is described for limiting current surges and the rate of current rise during the application of power to the converter from the power source. The control circuit comprises a control transistor whose collector and emitter are connected to the dc power source and the input to the converter. Control means are connected to the control transistor to increase its conduction after the application of power from the dc power source. A feedback circuit is provided to limit the power necessary to maintain the control transistor in saturation. The control transistor and associated circuitry function as a time variable current limiter in the active region and as a saturated switch in the steady-state mode. Advantages provided by utilization of this control circuit are a simple, reliable, and effective circuit for suppressing turn-on current transients of dc-to-dc power converters; substantial weight, size, and cost reduction; and improved performance. Official Gazette of the U.S. Patent Office



N75-18477* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

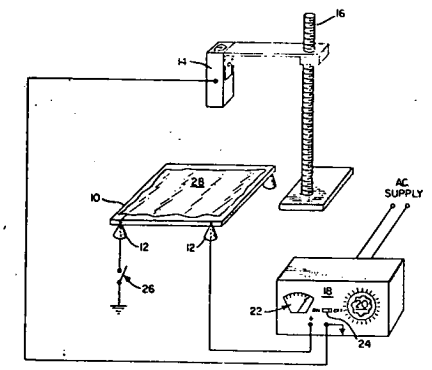
ELECTROSTATIC MEASUREMENT SYSTEM Patent

James E. Johnston, inventor (to NASA) Issued 11 Feb. 1975 4 p Filed 15 Jun. 1973 Supersedes N73-26197 (11 - 17, p 2003)

(NASA-Case-MFS-22129-1; US-Patent-3,866,114; US-Patent-Appl-SN-370255; US-Patent-Class-324-32; US-Patent-Class-324-54) Avail: US Patent Office CSCL 09E

A system for and method of contact-electrifying a dielectric to determine its electrostatic properties is described. The dielectric is placed in contact with a contact plate means, and connected to a voltage source means to charge the contact plate and to contact-electrify the dielectric. The contact plate means is disconnected from the voltage source and a charge sensor means monitors the rate of decay of the charge on the dielectric. If a conductive path from the contact plate to ground is desired, a lead may be connected between the conductor and ground. Automatic timing and charge monitoring are preferred for maximum accuracy, especially where dielectrics treated with antistatic agents are tested.

Official Gazette of the U.S. Patent Office



N75-18479* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

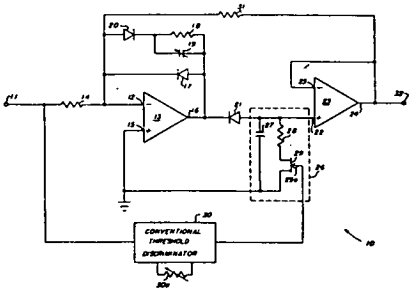
PEAK HOLDING CIRCUIT FOR EXTREMELY NARROW PULSES Patent

Robert W. ONeill, inventor (to NASA) (Lockheed Electron. Co., Houston, Tex.) Issued 4 Mar. 1975 4 p Filed 21 May 1973 Supersedes N73-26231 (11 - 17, p 2007) Sponsored by NASA

(NASA-Case-MSC-14129-1; US-Patent-3,869,624; US-Patent-Appl-SN-362146; US-Patent-Class-307-267; US-Patent-Class-307-229; US-Patent-Class-307-235R; US-Patent-Class-328-58; US-Patent-Class-328-115; US-Patent-Class-328-151) Avail: US Patent Office CSCL 09C

An improved pulse stretching circuit comprising: a high speed wide-band amplifier connected in a fast charge integrator configuration; a holding circuit including a capacitor connected in parallel with a discharging network which employs a resistor and an FET; and an output buffer amplifier. Input pulses of very short duration are applied to the integrator charging the capacitor to a value proportional to the input pulse amplitude. After a predetermined period of time, conventional circuitry generates a dump pulse which is applied to the gate of the FET making a low resistance path to ground which discharges the capacitor. When the dump pulse terminates, the circuit is ready to accept another pulse to be stretched. The very short input pulses are thus stretched in width so that they may be analyzed by conventional pulse height analyzers.

Official Gazette of the U.S. Patent Office



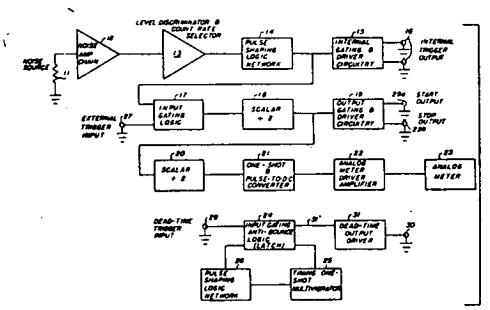
N75-19515* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

RANDOM PULSE GENERATOR Patent

Reed S. Lindsey, Jr., inventor (to NASA) (Lockheed Electron. Co., Houston, Tex.) Issued 11 Feb. 1975 8 p Filed 25 Jun. 1973 Supersedes N73-26199 (11 - 17, p 2003) Sponsored by NASA

(NASA-Case-MSC-14131-1; US-Patent-3,866,128; US-Patent-Appl-SN-373588; US-Patent-Class-328-59; US-Patent-Class-307-260; US-Patent-Class-324-78J; US-Patent-Class-331-78) Avail: US Patent Office CSCL 09E

An exemplary embodiment of the present invention provides a source of random width and random spaced rectangular voltage pulses whose mean or average frequency of operation is controllable within prescribed limits of about 10 hertz to 1 megahertz. A pair of thin-film metal resistors are used to provide a differential white noise voltage pulse source. Pulse shaping and amplification circuitry provide relatively short duration pulses of constant amplitude which are applied to anti-bounce logic circuitry to prevent ringing effects. The pulse outputs from the anti-bounce circuits are then used to control two one-shot multivibrators whose output comprises the random length and random spaced rectangular pulses. Means are provided for monitoring, calibrating and evaluating the relative randomness of the generator. Official Gazette of the U.S. Patent Office



N75-19516* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

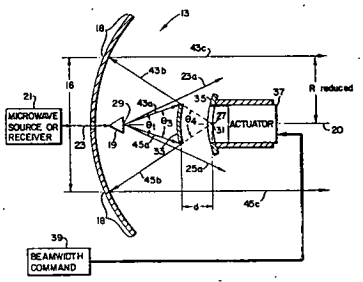
DISH ANTENNA HAVING SWITCHABLE BEAMWIDTH Patent

Richard F. Schmidt, inventor (to NASA) Issued 11 Feb. 1975 9 p Filed 10 Sep. 1973 Supersedes N73-32116 (11 - 23, p 2764

(NASA-Case-GSC-11760-1; NASA-Case-GSC-11783-1; US-Patent-3,866,233; US-Patent-Appl-SN-395868; US-Patent-Class-343-761; US-Patent-Class-343-781; US-Patent-Class-343-837) Avail: US Patent Office CSCL 09E

A switchable beamwidth antenna includes a concave parabolic main reflecting dish which has a central circular region and a surrounding coaxial annular region. A feed means selectively excites only the central region of the main dish via a truncated subreflector for wide beamwidth or substantially the entire main dish for narrow beamwidth. In one embodiment, the feed means comprises a truncated concave ellipsoid subreflector and separate feed terminations located at two foci of the ellipsoid. One feed termination directly views all of the main dish while the other feed termination, exciting the main dish via the subreflector, excites only the central region because of the subreflector truncation. In the another embodiment, the feed means comprises one feed termination and a convex hyperboloid subreflector via which the feed excites the main dish.

Official Gazette of the U.S. Patent Office



N75-19517* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

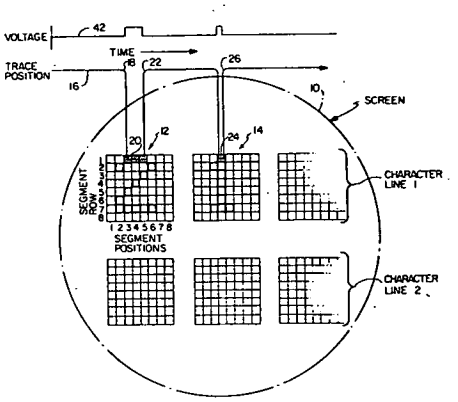
X-Y ALPHANUMERIC CHARACTER GENERATOR FOR OSCILLOSCOPES Patent

Donald C. Lokerson and Ronald E. Boston, inventors (to NASA) Issued 11 Feb. 1975 8 p Filed 14 Sep. 1973 Supersedes N73-32120 (11 - 23, p 2765)

(NASA-Case-GSC-11582-1; US-Patent-3,866,210; US-Patent-Appl-SN-397477; US-Patent-Class-340-324AD; US-Patent-Class-178-15; US-Patent-Class-315-18) Avail: US Patent Office CSCL 09A

A method and apparatus is disclosed by which any general purpose external trigger laboratory oscilloscope can be utilized to display alphanumeric characters. Each character to be displayed is composed of a plurality of segments appearing at various segment positions in various segment rows to define a conventional matrix. In between character segments to be displayed, or when no display is desired, the trace is effectively blanked by a vertical clamping voltage so as to position the oscilloscope trace in an off-screen position. The clamping technique of the invention, i.e., biasing the oscilloscope trace to an off-screen position when no character segment is to be displayed; it eliminates the necessity of providing Z-axis modulation to effect blanking.

Official Gazette of the U.S. Patent Office



N75-19518* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

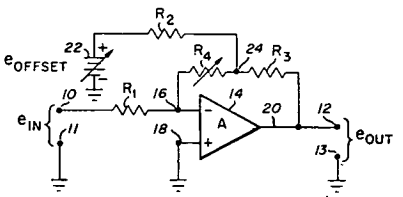
SIGNAL CONDITIONING CIRCUIT APPARATUS Patent

Vard B. Holland, inventor (to NASA) Issued 18 Mar. 1975 3 p Filed 5 May 1971 Supersedes N72-10205 (10 - 01, p 0031)

(NASA-Case-ARC-10348-1; US-Patent-3,872,395; US-Patent-Appl-SN-140439; US-Patent-Class-330-86; US-Patent-Class-330-69) Avail: US Patent Office CSCL 09C

A signal conditioning circuit is described including operational amplifier, a variable source of offset potential, and four resistive impedance. The circuit has constant input impedance independent of gain and offset adjustments. Gain change is effected by varying one of the impedances in an amplifier feedback circuit; offset adjustment is effected through variation of the offset potential source.

Official Gazette of the U.S. Patent Office



N75-19519* National Aeronautics and Space Administration. Pasadena Office, Calif.

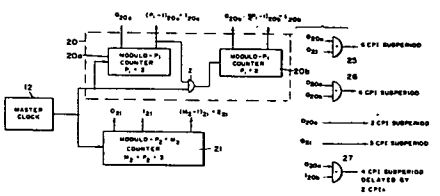
SYSTEM FOR GENERATING TIMING AND CONTROL SIGNALS Patent

Marvin Perlman (JPL), William J. Rousey (JPL), and Alan Messner, inventors (to NASA) (JPL) Issued 11 Feb. 1975 76 p Filed 26 Dec. 1972 Supersedes N73-18225 (11 - 09, p 1008) Sponsored by NASA

(NASA-Case-NPO-13125-1; US-Patent-3,866,022; US-Patent-Appl-SN-319150; US-Patent-Class-235-92DM; US-Patent-Class-235-92R; US-Patent-Class-235-92LG; US-Patent-Class-235-92VA; US-Patent-Class-235-92T) Avail: US Patent Office CSCL 09C

A system capable of generating every possible data frame subperiod and delayed subperiod of a data frame of length of M clock pulse intervals (CPIs) comprised of parallel modulo-m sub i counters is presented. Each m sub i is a prime power divisor of M and a cascade of alpha sub i identical modulo-p sub i counters. The modulo-p sub i counters are feedback shift registers which cycle through p sub i distinct states. Every possible nontrivial data frame subperiod and delayed subperiod is derived and a specific CPI in the data frame is detected. The number of clock pulses required to bring every modulo-p sub i counter to a respective designated state or count is determined by tl e Chinese remainder theorem. This corresponds to the solution o simultaneous congruences over relatively prime moduli.

Official Gazette of the U.S. Patent Office



N75-19520* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

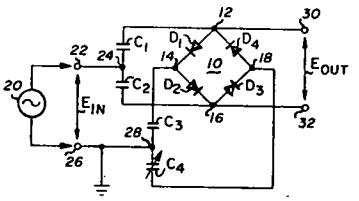
DIODE-QUAD BRIDGE CIRCUIT MEANS Patent

Dean R. Harrison and John Dimeff, inventors (to NASA) Issued 4 Mar. 1975 9 p Filed 22 Apr. 1974 Supersedes N74-26760 (12 - 16, p 1895) Continuation-in-part of abandoned US Patent Appl. SN-209618, filed 20 Dec. 1971

(NASA-Case-ARC-10364-3; US-Patent-3,869,676; US-Patent-Appl-SN-462844; US-Patent-Class-329-204; US-Patent-Class-307-321; US-Patent-Class-324-DIG.1; US-Patent-Class-329-166; US-Patent-Class-332-47; US-Patent-Appl-SN-209618) Avail: US Patent Office CSCL 09C

A transducer and frequency discriminator circuit is described including a four-terminal circulating diode bridge, a first pair of capacitors connected in series across two terminals of the bridge, and a second pair of capacitors, or other impedance elements, connected in series across the other two terminals of the bridge. A source of balanced alternating electrical energy for energizing the circuit is coupled between the commonly connected plates of the first pair of capacitors and the commonly connected plates of the second pair of capacitors. Due to the operation of the diode bridge, the sum of the resultant charges developed on the first pair of capacitors is proportional to the relationship between the respective capacitors of the second pair, and consequently, an output voltage taken across the first pair of capacitors will be proportional to that relationship.

Official Gazette of the U.S. Patent Office



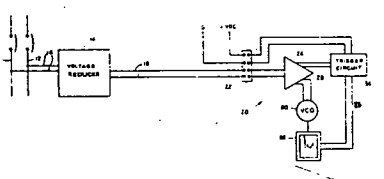
N75-19521* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

VOLTAGE MONITORING SYSTEM Patent

Carl L. Canicatti, inventor (to NASA) Issued 4 Mar. 1975 6 p Filed 6 Apr. 1973 Supersedes N73-23290 (11 - 14, p 1640) (NASA-Case-KSC-10736-1; US-Patent-3,869,667; US-Patent-Appl-SN-348787; US-Patent-Class-324-113; US-Patent-Class-324-102) Avail: US Patent Offike CSCL 09E

A description is given of a system for monitoring the voltage at a remote location and determining when the voltage exceeds upper and lower levels. The system includes transmission lines for transmitting the voltage back to a central station and applying such to an amplifier having a pair of outputs. One of the outputs of the amplifier is applied to an oscillograph. The other output is fed through an isolation transformer, a full wave rectifier, to a pair of unijunctional transistor circuits for producing pulses when the voltage exceeds or drops below a predetermined level. These pulses, in turn, energize a relay which turns on the oscillograph for recording the voltages being monitored.

Official Gazette of the U.S. Patent Office

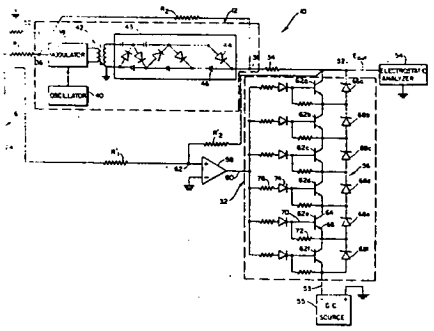


N75-19522* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

CONTROLLABLE HIGH VOLTAGE SOURCE HAVING FAST SETTLING TIME Patent

Henry Doong and Mario H. Acuna, inventors (to NASA) Issued 4 Mar. 1975 6 p Filed 19 Mar. 1974 Supersedes N74-19853 (12 - 11, p 1269)
(NASA-Case-GSC-11844-1; US-Patent-3,869,659; US-Patent-Appl-SN-452761; US-Patent-Class-321-15; US-Patent-Class-307-227; US-Patent-Class-324-32) Avail: US Patent Office CSCL 09E

A high voltage dc stepping power supply for sampling a utilization device such as an electrostatic analyzer has a relatively fast settling time for voltage steps. The supply includes a waveform generator for deriving a low voltage staircase waveform that feeds a relatively long response time power supply, deriving a high output voltage generally equal to a predetermined multiple of the input voltage. In the power supply, an ac voltage modulated by the staircase waveform is applied to a step-up transformer and then to a voltage multiplier stack to form a high voltage, relatively poor replica of the input waveform at an intermediate output terminal. A constant dc source, applied to the input of the power supply, biases the voltage at the intermediate output terminal to be in excess of the predetermined multiple of the input voltage. Official Gazette of the U.S. Patent Office

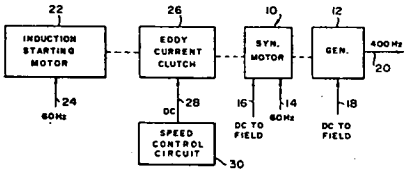


N75-19524* National Aeronautics and Space Administration. Pasadena Office, Calif.

MOTOR RUN-UP SYSTEM Patent

John J. Daeges, inventor (to NASA) (JPL) Issued 18 Feb. 1975 8 p Filed 7 Mar. 1974 Supersedes N74-17949 (12 - 09, p 1031) Sponsored by NASA
(NASA-Case-NPO-13374-1; US-Patent-3,867,677; US-Patent-Appl-SN-449118; US-Patent-Class-318-137; US-Patent-Class-318-167; US-Patent-Class-318-176; US-Patent-Class-318-183) Avail: US Patent Office CSCL 09C

A starting system is described for bringing a large synchronous motor up to speed to prevent large power line disturbances at the moment the motor is connected to the power line. The system includes (1) a digital counter which generates a count determined by the difference in frequency between the power line and a small current generated by the synchronous motor; (2) a latch which stores the count; and (3) a comparator which compares the stored count with a newly generated count to determine whether the synchronous motor is accelerating or decelerating. Signals generated by the counter and comparator control the current to a clutch that couples a starting motor to the large synchronous motor.
Official Gazette of the U.S. Patent Office

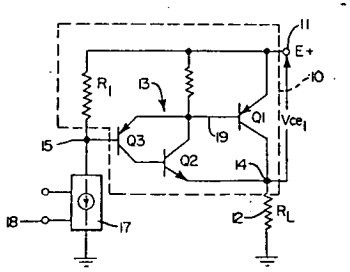


N75-19536*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

DUAL MODE SOLID STATE POWER SWITCH Patent Application

Louis C. Maus (Sperry Rand Corp.) and Donald E. Williams, inventors (to NASA) Filed 11 Mar. 1975 13 p
(NASA-Case-MFS-22880-1; US-Patent-Appl-SN-557444) Avail: NTIS HC $3.25 CSCL 09A

A power switch is described which operates as a simple saturated switch when the load current is less than a predetermined value, and as a Darlington circuit when an overload or transient condition exists. It comprises a two-stage transistor amplifier connected in a Darlington configuration with a transistor interconnecting the collectors of the transistors, and arranged so that the input transistor and the interconnecting transistor form a compound transistor. By reason of the compound configuration between the transistors, the input impedance of the switch is large and keeps the base current drive of the interstage transistor relatively low. This reduces power losses and increases efficiency. NASA



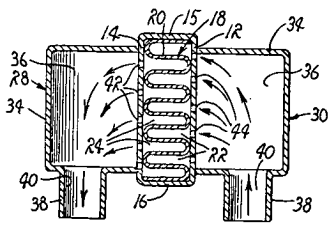
34 FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

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

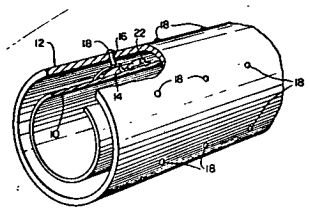
N75-10366*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AN IMPROVED HEAT EXCHANGER Patent Application
Roy F. Holmes (Gen. Dyn./Convair, San Diego, Calif.) and Edward E. Keller, inventors (to NASA) (Gen. Dyn./Convair, San Diego, Calif.) Filed 5 Nov. 1974 15 p Sponsored by NASA
(NASA-Case-MFS-22991-1; US-Patent-Appl-SN-521006) Avail: NTIS HC $3.25 CSCL 20M

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



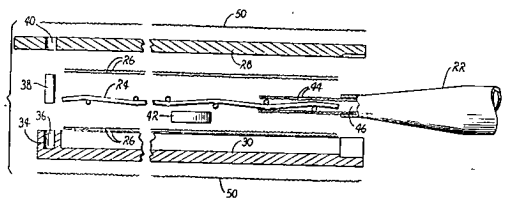
N75-12222* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
STRUCTURAL HEAT PIPE Patent
Stanford Ollendorf, inventor (to NASA) Issued 12 Nov. 1974 5 p Filed 14 Sep. 1973 Supersedes N73-32828 (11 - 23, p 2857)
(NASA-Case-GSC-11619-1; US-Patent-3,847,208; US-Patent-Appl-SN-397476; US-Patent-Class-165-1; US-Patent-Class-138-113; US-Patent-Class-138-114; US-Patent-Class-138-148; US-Patent-Class-220-15; US-Patent-Class-165-47; US-Patent-Class-165-105; US-Patent-Class-244-1SC) Avail: US Patent Office CSCL 20M

A combined structural reinforcing element and heat transfer member is disclosed for placement between a structural wall and an outer insulation blanket. The element comprises a heat pipe, one side of which supports the outer insulation blanket, the opposite side of which is connected to the structural wall. Heat penetrating through the outer insulation blanket directly reaches the heat pipe and is drawn off, thereby reducing thermal gradients in the structural wall. The element, due to its attachment to the structural wall, further functions as a reinforcing member. Official Gazette of the U.S. Patent Office



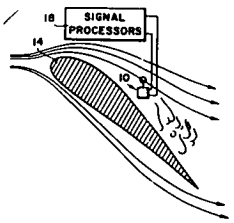
N75-15902*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AN IMPROVED HEAT TRANSFER DEVICE Patent Application
Larry R. Eaton, inventor (to NASA) (McDonnell Douglas Astron. Co., Huntington Beach, Calif.) Filed 21 Jan. 1975 15 p Sponsored by NASA
(NASA-Case-MFS-22938-1; US-Patent-Appl-SN-542754) Avail: NTIS HC $3.25 CSCL 20D

A heat transfer device has been developed that is particularly suited for use as an evaporator plate in a diffusion cloud chamber. NASA



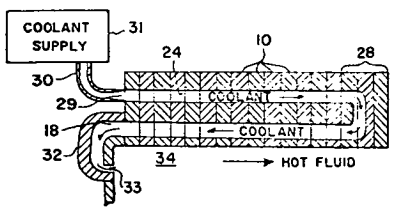
N75-16770*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SYSTEM FOR MEASURING REYNOLDS STRESS IN A TURBULENTLY FLOWING FLUID Patent Application
Dah Yu Cheng, inventor (to NASA) (Santa Clara Univ.) Filed 29 Jan. 1975 22 p Sponsored by NASA
(NASA-Case-ARC-10755-2; US-Patent-Appl-SN-545284) Avail: NTIS HC $3.25 CSCL 14B

A system is described for measuring momentum flux in a turbulent flowing liquid, and for real time measurement of the Reynolds stress wave and the Reynolds stress. The probe introduced into the turbulent fluid to be measured is capable of generating two electrical signals representative of orthogonal velocity components of the fluid. The probe includes a spherical portion attached to an elongated member supported by a viscoelastomeric collar. The ac velocity signals generated by the coils are amplified, integrated, multiplied, and divided by the processing circuit. The signal emanating from a divider is displayed on a scope and fed to a meter which responds to the true rms value of the dc and ac components of the Reynolds stress wave. The time averaged output of the meter is the Reynolds stress. Probe position control simultaneously moves the probe along one axis and moves the pen of the plotter along the abscissa.
NASA



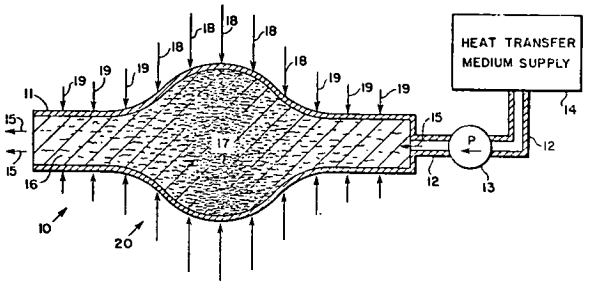
N75-19579*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HEAT EXCHANGER Patent Application
D. E. Sokolowski, inventor (to NASA) Filed 19 Mar. 1975 13 p
(NASA-Case-LEW-12252-1; US-Patent-Appl-SN-559847) Avail: NTIS HC $3.25 CSCL 20M

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



N75-19580*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A HEAT EXCHANGER AND METHOD OF MAKING Patent Application
Anthony Fortini and John M. Kazaroff, inventors (to NASA) Filed 19 Mar. 1975 14 p
(NASA-Case-LEW-12441-1; US-Patent-Appl-SN-559846) Avail: NTIS HC $3.25 CSCL 20M

A heat exchanger is described which consists of a metal shell containing a porous metal matrix, such as sinstered powdered metal, metal fibers, or metal foam. The matrix is metallically bonded or welded to the shell to eliminate high thermal resistance contact points. Cooling fluid flows from the supply, through the conduit, the pump, and the heat exchanger. They density of the porous metal matrix may be made greater to provide additional heat transfer where heat flux is high. Because the increased density will reduce the flow rate of the cooling fluid, an increased diameter may be provided to minimize or eliminate this effect. Both the density of the matrix and the diameter of the shell may be selected to provide the desired heat transfer and the cooling fluid flow rate appropriate to the heat flux variations along the shell.
NASA



35 INSTRUMENTATION AND PHOTOGRAPHY

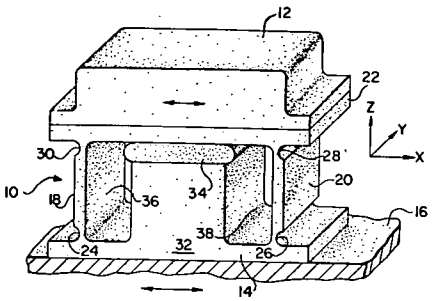
Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

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

N75-10407*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
TRANSLATORY SHOCK ABSORBERS FOR ATTITUDE SENSORS Patent Application
George L. vonPragenau, Irving T. Morgan, and Clifton A. Kirby, inventors (to NASA) Filed 29 Oct. 1974 15 p
(NASA-Case-MFS-22905-1; US-Patent-Appl-SN-518545) Avail: NTIS HC $3.25 CSCL 14B

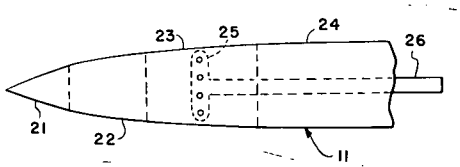
A translatory shock absorber is provided for mounting an attitude sensor so as to isolate the sensor from translatory vibrations. The translatory shock absorber includes a hollow block structure formed as one piece to form a parallelogram. The absorber block structure includes a movable top plate for supporting the attitude sensor and a fixed base plate with opposed

side plates interposed between the plates. At the junctions of the side plates, and the base and top plates, there are machined-out grooves which act as flexible hinges for attenuating translatory vibrations. A damping material is supported on a pedestal which is carried on the base plate between the side plates. The top of the damping material rests against the bottom surface of the top plate for eliminating the resonant peaks of vibration. NASA



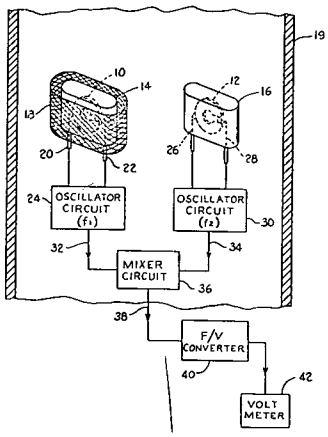
N75-10412*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AN IMPROVED STATIC PRESSURE PROBE Patent Application
Shimer Z. Pinckney, inventor (to NASA) Filed 29 Oct. 1974 10 p
(NASA-Case-LAR-11552-1; US-Patent-Appl-SN-518685) Avail: NTIS HC $3.25 CSCL 14B

An improved design for shortened static pressure probes for supersonic velocities, is given. The probe has a smaller length than conventional static probes with the same diameter and requires no compensation for yaw angles of up to 10 deg.
NASA



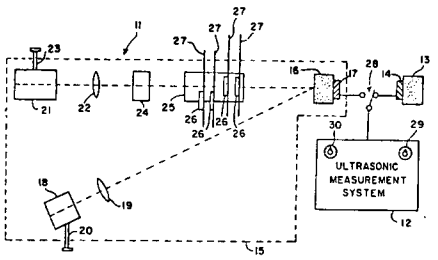
N75-10414*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
CARBON MONOXIDE MONITOR Patent Application
Robert J. Naumann, inventor (to NASA) Filed 6 Nov. 1974 13 p
(NASA-Case-MFS-22060-1; US-Patent-Appl-SN-521603) Avail: NTIS HC $3.25 CSCL 14B

A device is provided for automatic, real time monitoring of carbon monoxide and for providing a continuous read out of the concentration of carbon monoxide. The monitoring device includes two Y-cut, temperature sensitive quartz crystals which are encapsulated in a helium filled can. One of the cans containing a quartz crystal is surrounded by a wire mesh which carries a thin layer of hopcalite coating. The hopcalite is used for oxidizing the carbon monoxide and the resulting heat of the reaction is detected by the temperature sensitive crystal. Each crystal is driven by a conventional crystal controlled oscillator circuit with a constant frequency bias of a few hundred Hz. The frequencies of the two oscillator circuits are fed into a conventional mixer circuit which beats the frequencies together and produces a single net frequency which is the difference between the two frequencies. NASA



N75-11248*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
ULTRASONIC CALIBRATION DEVICE Patent Application
Joseph S. Heyman and James G. Miller, inventors (to NASA) (Washington Univ.) Filed 11 Nov. 1974 10 p
(NASA-Case-LAR-11435-1; US-Patent-Appl-SN-522556) Avail: NTIS HC $3.25 CSCL 14B

An ultrasonic calibration device for producing known changes in both acoustic absorption and phase velocity is reported. The calibration signal arises from an actual change of acoustic parameters, not from an electrical simulation. Thus, changes in ultrasonic time domain decay rates and frequency domain line widths are produced. Therefore, the device is able to simulate not only changes in ultrasonic absorption and phase velocity but also the sensitivity enhancement achieved by the use of ultrasonic resonators. The latter simulation cannot be achieved using electrical calibration techniques. NASA



N75-11307*# National Aeronautics and Space Administration. Pasadena Office, Calif.

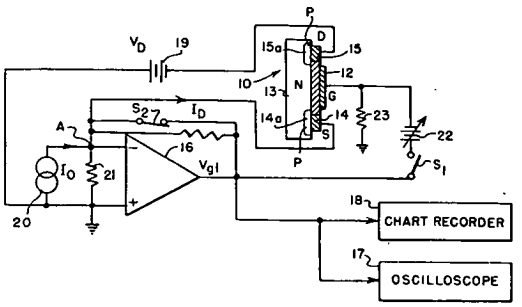
METHOD AND APPARATUS FOR MEASUREMENT OF TRAP DENSITY AND ENERGY DISTRIBUTION IN DIELECTRIC FILMS Patent Application

Joseph Maserjian, inventor (to NASA) (JPL) Filed 11 Nov. 1974 17 p

(Contract NAS7-100)

(NASA-Case-NPO-13443-1; US-Patent-Appl-SN-522551) Avail: NTIS HC $3.25 CSCL 14B

A report is made on the use of a tunnel injection method and apparatus to measuring trap densities and distribution in dielectric films in metal-dielectric-semiconductor structures. Under applied bias to the transistor gate, carriers (electrons or holes) tunnel into traps in the dielectric film. The resulting space charge tends to change channel conductance. By feeding back a signal from the source contact to the gate electrode, channel conductance is held constant, and by recording the gate voltage as a function of time, trap density can be determined as a function of distance from the dielectric-semiconductor interface. The process is repeated with the gate bias voltage at different levels in order to determine the energy distribution of traps as a function of distance from the interface. NASA



N75-11308*# National Aeronautics and Space Administration. Pasadena Office, Calif.

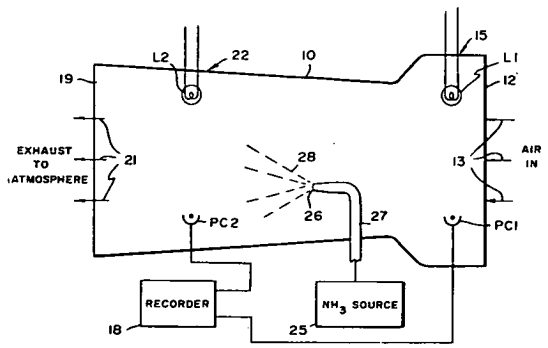
AN INDICATOR PROVIDING CONTINUOUS INDICATION OF THE PRESENCE OF A SPECIFIC POLLUTANT IN AIR Patent Application

Charles G. Miller (JPL) and Ralph E. Bartera, inventors (to NASA) (JPL) Filed 7 Nov. 1974 12 p

(Contract NAS7-100)

(NASA-Case-NPO-13474-1; US-Patent-Appl-SN-521817) Avail: NTIS HC $3.25 CSCL 14B

The continuous HCl in-air indicator consists of a tube-like element with an inlet end through which a continuous stream of air containing HCl enters. The air flows downstream from the inlet end and exits at the element's outlet end. First and second space apart photoelectric units are preferably positioned adjacent the inlet and outlet ends, respectively. Ammonia gas is injected into the air, flowing through the element, at a position between the two photoelectric units. The ammonia gas reacts with the HCl in the air to form ammonium chloride particles. The difference between the outputs of the two photoelectric units is an indication of the amount of HCl in the air stream. NASA



N75-11309*# National Aeronautics and Space Administration. Pasadena Office, Calif.

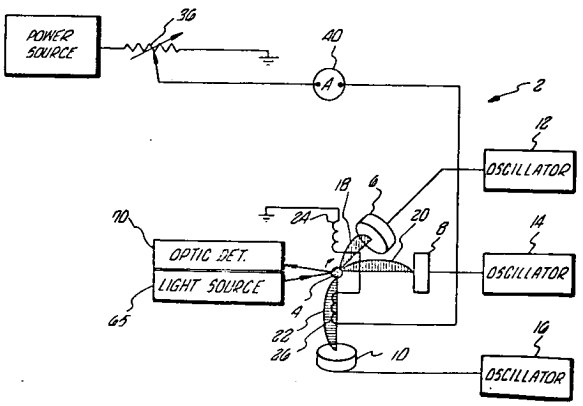
MAGNETOMETER USING A SUPERCONDUCTING ROTATING BODY Patent Application

Melvin M. Saffren (JPL) and Daniel D. Elleman, inventors (to NASA) (JPL) Filed 11 Nov. 1974 24 p

(Contract NAS7-100)

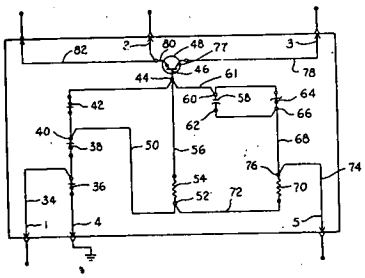
(NASA-Case-NPO-13388-1; US-Patent-Appl-SN-522552) Avail: NTIS HC $3.25 CSCL 14B

The construction and operation of a magnetometer which uses a superconducting, freely rotatable body sensitive to an incident magnetic field are discussed. The instrument is based on the application of the de-Haas Van Alpen effect to measure the direction and strength of an unknown magnetic field. The device provides intrinsic levitational stability to the measuring sphere, low power requirements, and a simplified unit for use in outer space. NASA



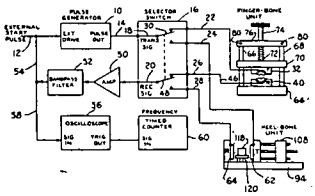
N75-12270* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
SIGNAL CONDITIONER TEST SET Patent
Walter H. Houck and Jon D. Stigberg, inventors (to NASA) Issued 12 Nov. 1974 6 p Filed 30 Mar. 1973 Supersedes N73-23527 (11 - 14, p 1667)
(NASA-Case-KSC-10750-1; US-Patent-3,848,190; US-Patent-Appl-SN-346372; US-Patent-Class-324-158T; US-Patent-Class-324-60C) Avail: US Patent Office CSCL 14B

A system was developed for testing components contained in a signal conditioning module with a transistor and capacitor included in a circuit. The system includes a housing with a socket into which the module to be tested is plugged. A test switch is provided for selectively connecting a variable load to either a transistor or capacitor in the circuit for testing the operation. A signal generating circuit is provided for generating signals for use in testing the components of the module.
Official Gazette of the U.S. Patent Office



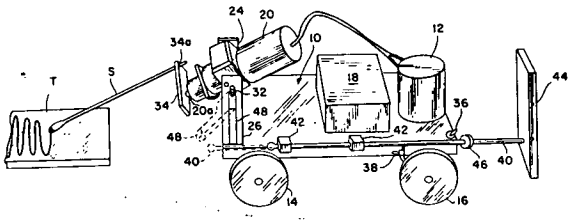
N75-12271* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ULTRASONIC BONE DENSITOMETER Patent
James M. Hoop, inventor (to NASA) Issued 12 Nov. 1974 7 p Filed 8 Aug. 1973 Supersedes N73-30090 (11 - 21, p 2504)
(NASA-Case-MFS-20994-1; US-Patent-3,847,141; US-Patent-Appl-SN-386789; US-Patent-Class-128-2V; US-Patent-Class-73-67.1) Avail: US Patent Office CSCL 06B

A device, for measuring the density of a bone structure so as to monitor the calcium content, is described. A pair of opposed spaced ultrasonic transducers are held within a clamping apparatus closely adjacent the bone being analyzed. These ultrasonic transducers incude piezoelectric crystals shaped to direct signals through the bone encompassed in the heel and finger of the subject being tested. A pulse generator is coupled to one of the transducers and generates an electric pulse for causing the transducers to generate an ultrasonic sound wave which is directed through the bone structure to the other transducer. An electric circuit, including an amplifier and a bandpass filter couples the signals from the receiver transducer back to the pulse generator for retriggering the pulse generator at a frequency proportional to the duration that the ultrasonic wave takes to travel through the bone structure being examined.
Official Gazette of the U.S. Patent Office



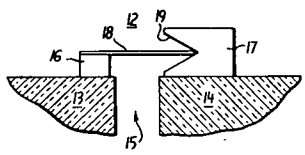
N75-12272* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
APPARATUS FOR MICROBIOLOGICAL SAMPLING Patent
Judd R. Wilkins and Stacey M. Mills, inventors (to NASA) Issued 15 Oct. 1974 5 p Filed 24 Jan. 1973 Supersedes N73-16061 (11 - 07, p 0745)
(NASA-Case-LAR-11069-1; US-Patent-3,841,973; US-Patent-Appl-SN-326198; US-Patent-Class-195-127) Avail: US Patent Office CSCL 06M

An automatic apparatus is described for microbiologically sampling surface using a cotton swab which eliminates human error. The apparatus includes a self-powered transport device, such as a motor-driven wheeled cart, which mounts a swabbing motor drive for a crank arm which supports a swab in the free end thereof. The swabbing motor is pivotably mounted and an actuator rod movable responsive to the cart traveling a predetermined distance provides lifting of the swab from the surface being sampled and reversal of the direction of travel of the cart.
Official Gazette of the U.S. Patent Office



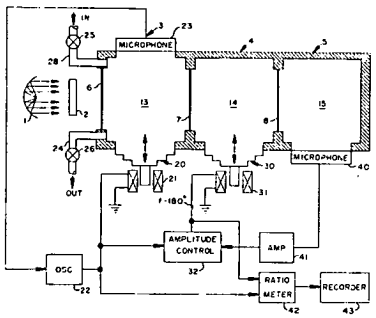
N75-12273* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
STRAIN GAUGE AMBIGUITY SENSOR FOR SEGMENTED MIRROR ACTIVE OPTICAL SYSTEM Patent
Charles L. Wyman and Thomas L. Howe, inventors (to NASA) Issued 22 Oct. 1974 5 p Filed 1 Feb. 1973 Supersedes N73-17563 (11 - 08, p 0923)
(NASA-Case-MFS-20506-1; US-Patent-3,842,509; US-Patent-Appl-SN-328792; US-Patent-Class-33-180R; US-Patent-Class-33-DIG.13; US-Patent-Class-350-292) Avail: US Patent Office CSCL 14B

A system is described to measure alignment between interfacing edges of mirror segments positioned to form a segmented mirror surface. It serves as a gauge having a bending beam with four piezoresistive elements coupled across the interfaces of the edges of adjacent mirror segments. The bending beam has a first position corresponding to alignment of the edges of adjacent mirror segments, and it is bendable from the first position in a direction and to a degree dependent upon the relative misalignment between the edges of adjacent mirror segments to correspondingly vary the resistance of the strain guage. A source of power and an amplifier are connected in circuit with the strain gauge whereby the output of the amplifier varies according to the misalignment of the edges of adjacent mirror segments.
Official Gazette of the U.S. Patent Office



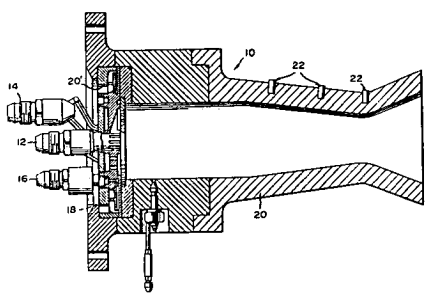
N75-12275*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
NULLING DEVICE FOR DETECTION OF TRACE GASES BY NDIR ABSORPTION Patent Application
John Dimeff, inventor (to NASA) Filed 22 Nov. 1974 13 p (NASA-Case-ARC-10760-1; US-Patent-Appl-SN-526438) Avail: NTIS HC $3.25 CSCL 14B

A nondispersive gas analyzing apparatus is described having a chamber for containing gas. An energy source is provided for passing radiant energy through the chamber. Means are also provided for modulating the radiant energy passing through the chamber by modulating the volume at the acoustic resonance frequency of the gas. Signal generating means including a second chamber for containing a gas which is heated by radiant energy emerging from the first chamber. A microphonic means responsive to the resulting pressurization in the second chamber is included for generating a signal. NASA



N75-12276*# National Aeronautics and Space Administration. Pasadena Office, Calif.
THERMOCOUPLE INSTALLATION Patent Application
Walter B. Powell (JPL), Lee R. Potter (JPL), and Kenton S. MacDavid, inventors (to NASA) (JPL) Filed 22 Nov. 1974 20 p
(Contract NAS7-100)
(NASA-Case-NPO-13540-1; US-Patent-Appl-SN-526450) Avail: NTIS HC $3.25 CSCL 14B

A thermocouple plug that can be installed in a rocket engine wall or other metal plate to measure transient temperatures was developed. A description of the device and drawings of the equipment are provided. The thermocouple wires are located in a pair of narrow holes that lie near the thermocouple end of a plug and the wires are welded to the region of the plug material that lies between the holes. NASA

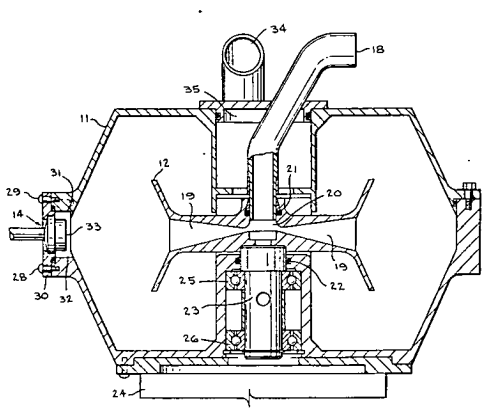


N75-13213* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HALL EFFECT MAGNETOMETER Patent
John A. Woollam, Harry A. Beale, and Ian L. Spain, inventors (to NASA) Issued 26 Nov. 1974 4 p Filed 30 Jan. 1973 Supersedes N73-29437 (11 - 20, p 2419) Continuation-in-part of US Patent Appl. SN-254173, filed 17 May 1972
(NASA-Case-LEW-11632-2; US-Patent-3,849,875; US-Patent-Appl-SN-327969; US-Patent-Class-29-592; US-Patent-Class-29-571; US-Patent-Class-307-309; US-Patent-Class-317-235H; US-Patent-Class-330-6; US-Patent-Appl-SN-254173) Avail: US Patent Office CSCL 14B

A magnetometer which uses a single crystal of bismuth selenide is described. The rhombohedral crystal structure of the sensing element is analyzed. The method of construction of the magnetometer is discussed. It is stated that the sensing crystal has a positive or negative Hall coefficient and a carrier concentration of about 10 to the 18th power to 10 to the 20th power per cubic centimeter. Official Gazette of the U.S. Patent Office

N75-13218*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
FLUID MASS SENSOR Patent Application
G. L. Fogal, inventor (to NASA) (GE, Philadelphia) Filed 7 Nov. 1974 14 p Sponsored by NASA
(Contract NAS9-13519)
(NASA-Case-MSC-14653-1; US-Patent-Appl-SN-521816) Avail: NTIS HC $3.25 CSCL 14B

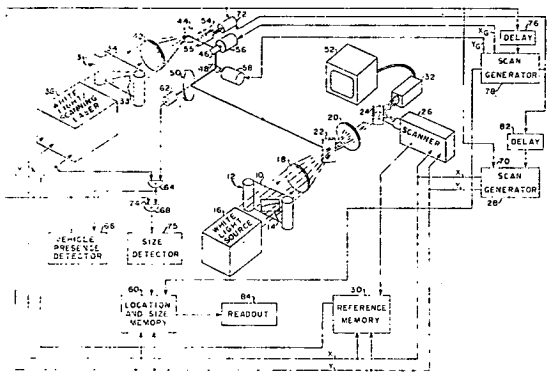
An apparatus and method for accurate measurement of a fluid mass in real time are described. The system is effective under conditions of reduced gravity and is used for urine collection and measurement during space flight. Diagrams of the device are provided. The system and method can be incorporated into other applications for fluid volume measurement where mixed flow conditions (fluid-gas) exist. NASA



N75-13226*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
TRAFFIC SURVEY SYSTEM Patent Application
Joseph H. Kerr, inventor (to NASA) Filed 11 Dec. 1974 16 p
(NASA-Case-MFS-22631-1; US-Patent-Appl-SN-531572) Avail: NTIS HC $3.25 CSCL 14E

A traffic survey system is described in which an aerial photo survey transparency is first made of a significant survey area. The transparency is then optically scanned to check the position

and size of vehicles on roadways in the area. By computer control comparison with a reference transparency wherein areas other than roadways are made opaque and roadways are made clear, scanning is directed solely to roadway regions. Vehicle size analysis is accomplished by means of discrete holographic filters corresponding to selected size vehicles. NASA



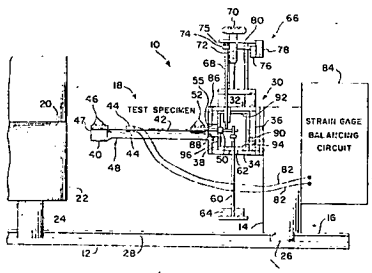
N75-13227*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

HIGH TEMPERATURE STRAIN GAGE CALIBRATION FIXTURE Patent Application

Thomas Vranas, inventor (to NASA) Filed 19 Dec. 1974 11 p

(NASA-Case-LAR-11500-1; US-Patent-Appl-SN-534266) Avail: NTIS HC $3.25 CSCL 14B

An apparatus and a method for calibrating strain gages in both the dead weight and constant deflection modes are described. A diagram of the equipment is provided. A cantilever support arm allows the test unit to slide into a furnace while one end is subjected to bending strain either by hanging weights on it or by deflecting it with a push rod. The dual nature of the fixture permits both tests to be run without change of the test specimen or removal from the furnace. The apparatus permits conducting calibration tests up to a temperature of 1600 F. NASA



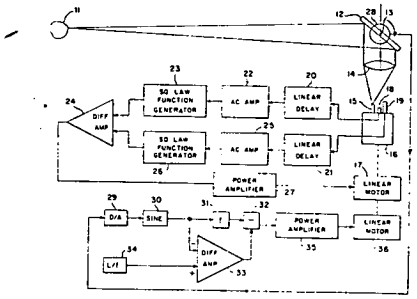
N75-15014* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

AUTOMATIC FOCUS CONTROL FOR FACSIMILE CAMERAS Patent

Archibald R. Sinclair, Ernest E. Burcher, and Stephen J. Katzberg, inventors (to NASA) Issued 24 Dec. 1974 6 p Filed 15 Oct. 1973 Supersedes N74-10420 (12 - 01, p 0053)

(NASA-Case-LAR-11213-1; US-Patent-3,857,031; US-Patent-Appl-SN-406715; US-Patent-Class-250-201; US-Patent-Class-356-4) Avail: US Patent Office CSCL 14E

An electronic circuit for controlling the focus of facsimile cameras is described. The circuit consists of balanced a.c. amplifiers, two square law function generators, and a differential amplifier and power drive. The invention includes a method for maintaining the imaging sensor at the expected location of the focal plane as the facsimile camera scans a scene or terrain. A block diagram of the electronic circuitry is provided. P.N.F.



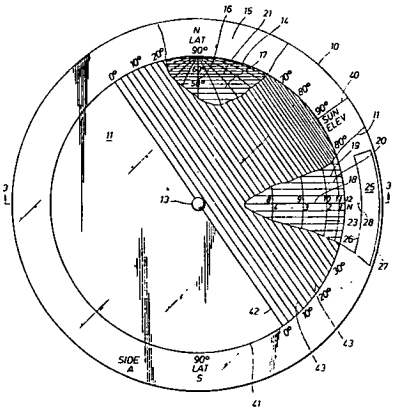
N75-15019*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

SUN ANGLE CALCULATOR Patent Application

Anne Flippin (Kentron Hawaii) and Arthur L. Schmitt, inventors (to NASA) Filed 11 Dec. 1974 13 p

(NASA-Case-MSC-12617-1; US-Patent-Appl-SN-531576) Avail: NTIS HC $3.25 CSCL 14B

A calculator apparatus for determining the angle of the sun relative to the horizon at any given place and time on the earth is described. A diagram of the calculator is provided and the method of operation is explained. The device limits the requirements for the use of solar tables and lengthy calculations involved in the present methods. NASA



N75-15931* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

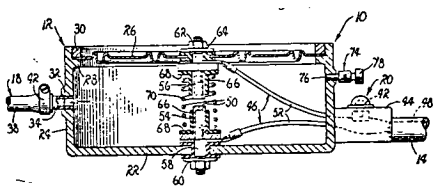
LEAK DETECTOR Patent

James T. Sawyer, inventor (to NASA) Issued 14 Jan. 1975 5 p Filed 5 Mar. 1973 Supersedes N73-18444 (11 - 09, p 1035)

(NASA-Case-MFS-21761-1; US-Patent-3,859,845; US-Patent-Appl-SN-337816; US-Patent-Class-73-49.2; US-Patent-Class-73-40; US-Patent-Class-200-83N) Avail: US Patent Office CSCL 14B

A detector for sensing a leaking of fluid pressures is reported. The detector is characterized by an hermetically sealed housing confining therewithin a first normalized pressure, a connector for coupling the housing in direct communication with a suspected leak established within a substantially sealed body, an electrical circuit having a first or normalized configuration and including a pair of circuit completing electrical contacts and means mounting at least one contact of said pair of contacts on a flexible wall of the housing supporting the contact for movement from a first position along a linear path to a second position in response to an altering of the pressure confined within the housing for thereby altering the configuration of the circuit.

Official Gazette of the U.S. Patent Office



N75-15932* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

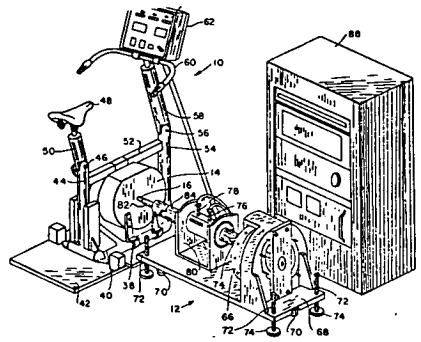
ERGOMETER CALIBRATOR Patent

Raymond L. Gause, inventor (to NASA) Issued 14 Jan. 1975 5 p Filed 31 Oct. 1973 Supersedes N74-11288 (12 - 02, p 0169)

(NASA-Case-MFS-21045-1; US-Patent-3,859,840; US-Patent-Appl-SN-411572; US-Patent-Class-73-1R; US-Patent-Class-73-379) Avail: US Patent Office CSCL 14B

An apparatus is presented for accurately calibrating ergometers so that the work rate produced by the particular ergometer being calibrated is accurate. The apparatus includes a dc motor which is coupled directly to the ergometer for rotating it at various speeds. Positioned on the shaft between the dc motor and the ergometer is a torque sensor and tachometer, which feed signals to a power computer for subsequent recording. A speed controller is utilized with the dc motor.

Official Gazette of the U.S. Patent Office



N75-15938*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

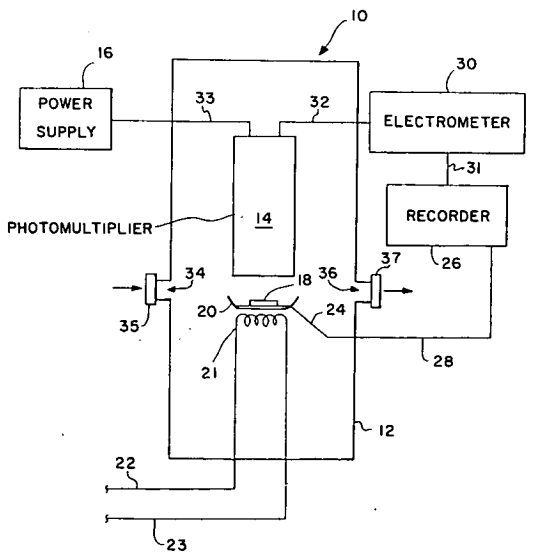
METHOD FOR DETECTING POLLUTANTS Patent Application

Robert S. Rogowski, Ralph R. Richards (Old Dominion Univ.), and Edmund J. Conway, inventors (to NASA) Filed 30 Dec. 1974 14 p

(NASA-Case-LAR-11405-1; US-Patent-Appl-SN-537480) Avail: NTIS HC $3.25 CSCL 14B

A method is described for detecting and measuring trace amounts of pollutants of the group consisting of ozone, nitrogen dioxide, and carbon monoxide in a gaseous environment. A sample organic solid material that will undergo a chemical reaction with the test pollutant is exposed to the test environment and heated in the temperature range of 100-200 C. The chemiluminescence of the solid organic material is measured and recorded as a function of concentration of the test pollution and is specific to the pollutant being tested.

NASA

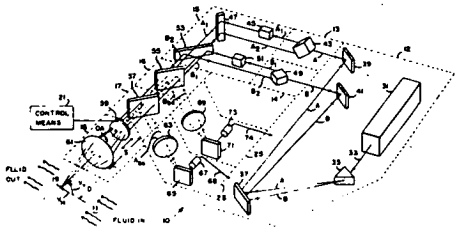


N75-16783* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

DUAL WAVELENGTH SCANNING DOPPLER VELOCIMETER Patent

Kenneth L. Rloff, George R. Grant, and William D. Gunter, Jr., inventors (to NASA) Issued 14 Jan. 1975 8 p Filed 18 Apr. 1973 Supersedes N73-21390 (11 - 12, p 1405)
(NASA-Case-ARC-10637-1; US-Patent-3,860,342; US-Patent-Appl-SN-352383; US-Patent-Class-356-28) Avail: US Patent Office CSCL 14B

A laser Doppler velocimeter is described simultaneously measuring localized orthogonal velocity components in a fluid stream without perturbation of the flowfield. A first pair of beams of a first common wavelength and a second pair of beams of a second common wavelength are derived from a single laser source, directed along a single optical axis. The respective beams of each pair of beams are disposed parallel to the axis, symmetrically about the axis, and are positioned orthogonally about the axis relative to each other. The four beams are then focused upon a selected test volume within the flowfield. Light scattered at that point is collected by an appropriate optical system and focused onto photodetectors which develop electrical output signals commensurate with the orthogonal velocity components at the test point. Official Gazette of the U.S. Patent Office

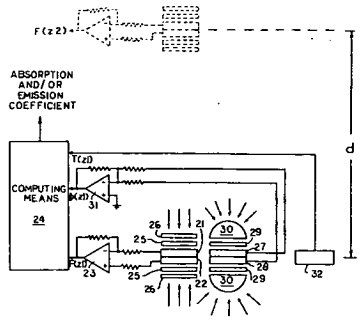


N75-16791*# National Aeronautics and Space Administration. Pasadena Office, Calif.

SCATTERING INDEPENDENT DETERMINATION OF ABSORPTION AND EMISSION COEFFICIENTS AND RADIATIVE EQUILIBRIUM STATE Patent Application

Alain L. Fymat, inventor (to NASA) (JPL) Filed 29 Jan. 1975 24 p
(Contract NAS7-100)
(NASA-Case-NPO-13677-1; NASA-Case-NPO-13678-1; US-Patent-Appl-SN-545285) Avail: NTIS HC $3.25 CSCL 14B

Techniques are described for determining at continuum or spectral line frequencies the true absorption (or emission) coefficients of a medium that simultaneously absorbs (or emits) and scatters incident radiation, and for studying the radiative equilibrium state. The technique measures the variations of net planar flux between pairs of planes spaced apart along each axis of inhomogeneity of the medium. The divergence of flux is determined as the sum of the variations divided by the distance. One plane of each pair is selected to be at the point of interest and, at that point, spherical flux and temperature are measured. Planck's function is evaluated from the temperature measurement, and the true absorption coefficient is determined from a divergence-flux relationship independent of scattering and polarization, and without the wavelength limitation. The true emission coefficient is also determined along with the state of radiative equilibrium. NASA

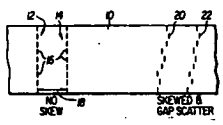


N75-16792*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

AUTOMATIC CHARACTER SKEW AND SPACING CHECKING NETWORK Patent Application

Robert T. McKenna, inventor (to NASA) Filed 6 Jan. 1975 25 p
(NASA-Case-GSC-11925-1; US-Patent-Appl-SN-538983) Avail: NTIS HC $3.25 CSCL 14B

A network is described for automatically checking the skew and character spacing of digital tape drive systems to indicate out-of-tolerance conditions of those parameters. The network enables a tape drive to check its own recording accuracy as well as that of tapes recorded on other drives. In operation, the first detected pulse of each character triggers a monostable multi-vibrator which locks out further data pulses and initiates a window pulse equal in length to the maximum permissible skew. At the end of the window pulse, data pulses may again be received. If a pulse is received after termination of the window pulse, the skew is determined to exceed specifications and a skew error indication is given by the illumination of a display light. A similar circuit arrangement is provided for detecting character spacing which is less than the minimum required for unambiguous data reproduction. NASA



N75-16807*# National Aeronautics and Space Administration. Pasadena Office, Calif.

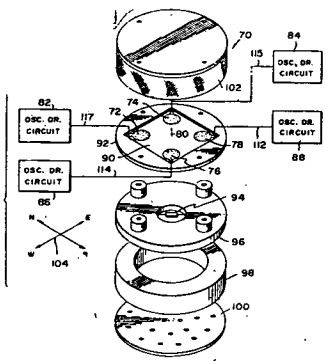
WIND SENSOR Patent Application

James B. Stephens (JPL) and Eric G. Laue, inventors (to NASA) (JPL) Filed 29 Jan. 1975 21 p

(Contract NAS7-100)

(NASA-Case-NPO-13462-1; US-Patent-Appl-SN-545282) Avail: NTIS HC $3.25 CSCL 14B

This device for sensing the temperature, velocity, and direction of the wind, includes four temperature-dependent crystal oscillators spaced about an axis, a heater centered on the axis, and a screen through which the wind blows to pass over the crystals. In one method of operation, the frequency of the oscillators is taken when the heater is not energized, to obtain the temperature of the wind, and the frequencies of the oscillators are taken after the heater is energized to determine the direction and velocity of the wind. When the heater is energized, the wind causes the downwind crystals to achieve a higher temperature than the upwind crystals, and with the magnitude of the difference indicating the velocity of the wind. NASA



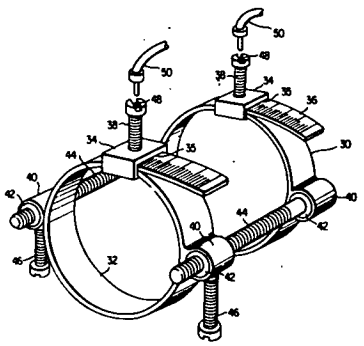
N75-18536*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

READOUT ELECTRODE ASSEMBLY FOR MEASURING L IMPEDANCE Patent Application

Leslie D. Montgomery (NAS-NRC) and Dwight L. Moody, Jr., inventors (to NASA) Filed 24 Feb. 1975 12 p

(NASA-Case-ARC-10816-1; US-Patent-Appl-SN-552554) Avail: NTIS HC $3.25 CSCL 14B

The invention relates generally to impedance plethysmography and specifically to readout electrodes for a tetra-polar impedance plethysmography system. In a tetra-polar impedance system transmitting ring electrodes are used to apply a low voltage, high frequency current across a body segment of a patient. Readout electrodes enable an output signal to be taken from the zone between the transmitting electrodes. The output signal is representative of the impedance between the readout electrodes, and the impedance is a function of the blood flow in the tested body segment. The main components of the invention are a pair of variable diameter ring electrodes which are connected to a pair of rods by means of busings contained within the cylindrical recesses. The axial displacement between the ring electrodes is adjusted by sliding rods with respect to bushings contained within the cylindrical recesses of the ring. The recording leads are coupled to ring electrodes by male connectors. NASA



N75-19611* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

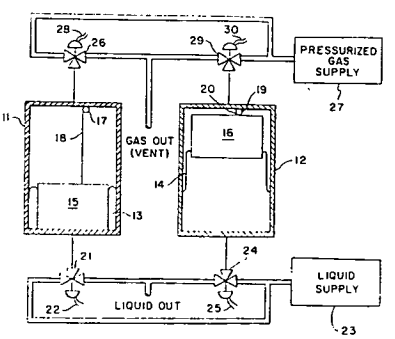
AUTOMATIC LIQUID INVENTORY COLLECTING AND DISPENSING UNIT Patent

John B. Hall, Jr. and Edwin F. Williams, inventors (to NASA) Issued 4 Feb. 1975 6 p Filed 21 Feb. 1973 Supersedes N73-18474 (11 - 09, p 1039)

(NASA-Case-LAR-11071-1; US-Patent-3,864,060; US-Patent-Appl-SN-334349; US-Patent-Class-417-36; US-Patent-Class-73-221; US-Patent-Class-417-138; US-Patent-Class-417-395) Avail: US Patent Office CSCL 14B

A means is provided for automatically collecting waste liquids and for simultaneously feeding these liquids into water recovery processes. The invention includes first and second tanks with first and second two-way solenoid valves associated with each of the tanks. The first solenoid valve is connected to the liquid source and its associated tank so as to allow liquid to flow into the tank when the valve is in its normal position and to allow the liquid to flow out of the tank when the valve is in its actuated position. The second valve is connected to its associated tank and a gas supply so as to allow gas inside the tank to flow out when the valve is in its normal position and to allow gas to flow from the gas supply into the tank when the valve is in its actuated position. Control circuits are included for actuating the two valves associated with the first tank and not actuating the valves associated with the second tank. The first tank is filled and the second tank is emptied.

Official Gazette of the U.S. Patent Office



N75-19612* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

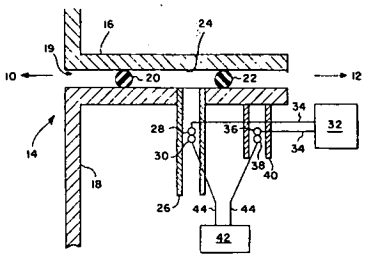
VACUUM LEAK DETECTOR Patent

George P. Kazokas, inventor (to NASA) (McDonnell-Douglas Corp., Huntington Beach, Calif.) Issued 11 Feb. 1975 5 p Filed 2 Oct. 1973 Supersedes N73-32344 (11 - 23, p 2793) Sponsored by NASA

(NASA-Case-LAR-11237-1; US-Patent-3,864,960; US-Patent-Appl-SN-402868; US-Patent-Class-73-46; US-Patent-Class-73-49.2; US-Patent-Class-340-242) Avail: US Patent Office CSCL 14B

A leak detector for use with high vacuum seals as used in feedthroughs and hatch covers for manned spacecraft and vacuum systems is described. Two thermistors are used, one exposed directly to vacuum and the other exposed to a secondary chamber formed by the seal being monitored and a second auxiliary seal. Leakage into the secondary chamber causes an unbalance of an electrical bridge circuit in which the thermistors are connected.

Official Gazette of the U.S. Patent Office



N75-19613* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

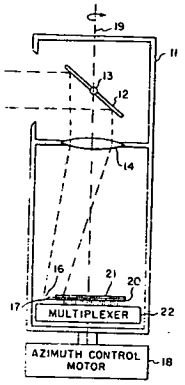
SPECTROMETER INTEGRATED WITH A FACSIMILE CAMERA Patent

Ernest E. Burcher, Daniel J. Jobson, Stephen J. Katzberg, and William L. Kelly, IV, inventors (to NASA) Issued 4 Mar. 1975 5 p Filed 2 Aug. 1973 Supersedes N73-28496 (11 - 19, p 2300)

(NASA-Case-LAR-11207-1; US-Patent-3,869,212; US-Patent-Appl-SN-385013; US-Patent-Class-356-189; US-Patent-Class-178-DIG.20; US-Patent-Class-250-332; US-Patent-Class-356-96; US-Patent-Class-356-186; US-Patent-Class-356-83) Avail: US Patent Office CSCL 14B

This invention integrates a spectrometer capability with the basic imagery function of facsimile cameras without significantly increasing mechanical or optical complexity, or interfering with the imaging function. The invention consists of a group of photodetectors arranged in a linear array in the focal plane of the facsimile camera with a separate narrow band interference filter centered over each photodetector. The interference filter photodetector array is on a line in the focal plane of the facsimile camera along the direction of image motion due to the rotation of the facsimile camera's vertical mirror. As the image of the picture element of interest travels down the interference filter photodetector array, the photodetector outputs are synchronously selected and sampled to provide spectral information on the single picture element.

Official Gazette of the U.S. Patent Office



N75-19614* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

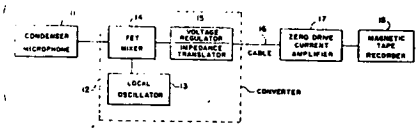
INSTRUMENTATION FOR MEASUREMENT OF AIRCRAFT NOISE AND SONIC BOOM Patent

Allan J. Zuckerwar, inventor (to NASA) (Youngstown State Univ.) Issued 4 Mar. 1975 7 p Filed 25 Apr. 1973 Supersedes N73-22387 (11 - 13, p 1529) Sponsored by NASA

(NASA-Case-LAR-11173-1; US-Patent-3,868,856; US-Patent-Appl-SN-354408; US-Patent-Class-73-557; US-Patent-Class-332-2) Avail: US Patent Office CSCL 14B

A jet aircraft noise and sonic boom measuring device which converts sound pressure into electric current is described. An electric current proportional to the sound pressure level at a condenser microphone is produced and transmitted over a cable, amplified by a zero drive amplifier and recorded on magnetic tape. The converter is comprised of a local oscillator, a dual-gate field-effect transistor (FET) mixer and a voltage regulator/impedance translator. A carrier voltage that is applied to one of the gates of the FET mixer is generated by the local oscillator. The microphone signal is mixed with the carrier to produce an electrical current at the frequency of vibration of the microphone diaphragm by the FET mixer. The voltage of the local oscillator and mixer stages is regulated, the carrier at the output is eliminated, and a low output impedance at the cable terminals is provided by the voltage regulator/impedance translator.

Official Gazette of the U.S. Patent Office



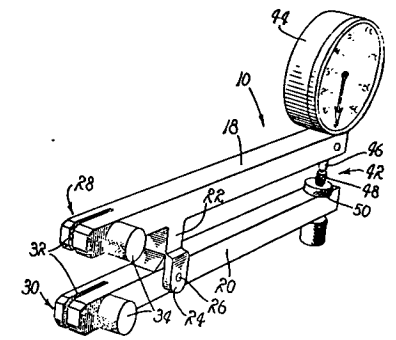
N75-19615* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

METER FOR USE IN DETECTING TENSION IN STRAPS HAVING PREDETERMINED ELASTIC CHARACTERISTICS Patent

George V. Buhler (McDonnell-Douglas Corp., Huntington Beach, Calif.) and Dale E. Havens, inventors (to NASA) (McDonnell-Douglas Corp., Huntington Beach, Calif.) Issued 11 Feb. 1975 5 p Filed 11 Oct. 1973 Supersedes N74-10421 (12 - 01, p 0053) Sponsored by NASA

(NASA-Case-MFS-22189-1; US-Patent-3,864,953; US-Patent-APPL-SN-405342; US-Patent-Class-73-143; US-Patent-Class-33-148D) Avail: US Patent Office CSCL 14B

A meter for detecting tension in elastic bodies, especially in fabric straps employed as tie down straps for stowed objects is presented. The meter is characterized by a pair of elongated arms coupled together for pivotal motion about a common axis in a common plane and a strap receiver located at adjacent ends of the arms for receiving and securing adjacent portions of the strap. The receivers are supported by the arms for motion along intersecting arcs, and motion detection means is located at the opposite ends of the arms for detecting the magnitude of the motion imparted to the receivers as the strap is placed in tension. Official Gazette of the U.S. Patent Office



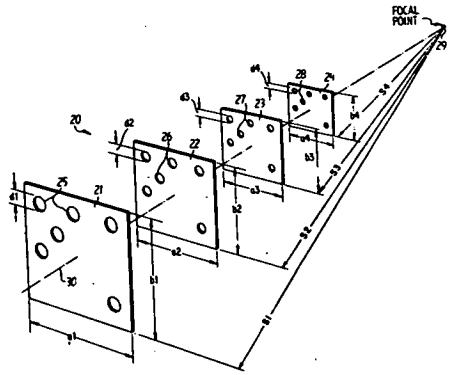
N75-19616* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

MULTIPLATE FOCUSING COLLIMATOR Patent

Richard B. Hoover and James H. Underwood, inventors (to NASA) Issued 4 Mar. 1975 5 p Filed 28 Jun. 1973 Supersedes N73-27380 (11 - 18, p 2150)

(NASA-Case-MFS-20932-1; US-Patent-3,869,615; US-Patent-Appl-SN-374441; US-Patent-Class-250-508; US-Patent-Class-250-510; US-Patent-Class-250-505) Avail: US Patent Office CSCL 14B

An appartus is described for scanning relatively small near sources of penetrating radiation to obtain the energy distribution thereof, wherein a collimator assembly is interposed between a radiation source and a radiation detector. The collimator assembly has a plurality of plates aligned in parallel planes with respect to a common axis normal to their centers. All the plates have similar random distribution of apertures. All apertures on each plate are the same size. The size of respective plates, the size of the apertures of said respective plates, and the spacing between said respective plates vary precisely according to a predetermined ratio to produce radiation channels which converge to a focal point. The radiation incident to the radiation detector is maximized when the focal point and the radiation source are co-incident. Official Gazette of the U.S. Patent Office



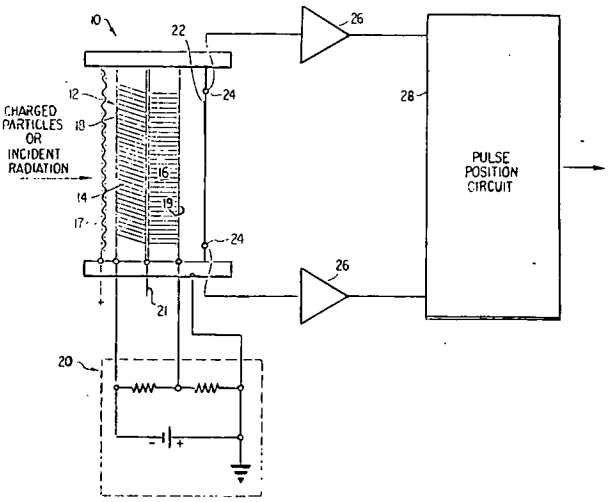
N75-19621*# National Aeronautics and Space Administration, Washington, D.C.

RESISTIVE ANODE IMAGE CONVERTER Patent Application

Michael L. Lampton (Calif. Univ., Berkeley) and Francesco Paresce, inventors (to NASA) (Calif. Univ., Berkeley) Filed 3 Mar. 1975 14 p Sponsored by NASA

(NASA-Case-HQN-10876-1; US-Patent-Appl-SN-555336) Avail: NTIS HC $3.25 CSCL 14E

An apparatus is disclosed for imaging soft X-ray and ultraviolet electromagnetic radiation and charged particles. The apparatus includes a pair of microchannel electron multiplier plates that are connected in a cascaded chevron configuration which intercepts an incident beam of radiation or charged particles which are being imaged. Incident photons or charged particles strike the front surface of the chevron configuration causing emission of electrons. The electrons are accelerated by a voltage gradient and strike the inner side walls of the individual channels which comprise the microchannel electron multiplier plates causing emission of secondary electrons. Accelerated and multiplied secondary electrons impinge upon a resistive anode after they transverse the chevron configuration. A pulse position circuit converts the magnitude or transit time of the currents flowing from the point of impact of the electrons on the resistive anode to four contact electrodes mounted on their periphery of the resistive anode into the spatial coordinates of electron impact. NASA



N75-19627*# National Aeronautics and Space Administration. Pasadena Office, Calif.

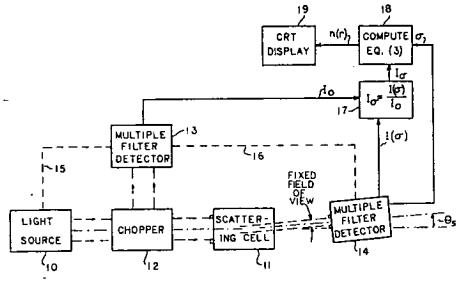
FREQUENCY SCANNING PARTICLE SIZE SPECTROMETER Patent Application

Alain L. Fymat, inventor (to NASA) (JPL) Filed 26 Feb. 1975 21 p

(Contract NAS7-100)

(NASA-Case-NPO-13606-1; US-Patent-Appl-SN-553210) Avail: NTIS HC $3.25 CSCL 14B

A method and apparatus for determining the distribution of particle sizes of a scattering medium of unknown chemical composition is reported. The apparatus, a particle size spectrometer, has a fixed field of view within the forward light scattering cone at an angle between approximately 100 and 200 minutes of arc, a spectral range extending approximately from 0.2 to 4.0 inverse micrometers and a spectral resolution between about 0.1 and 0.2 micrometers. The apparatus is employed to determine the distribution of particle sizes, independently of the chemical composition of the particles, from measurements of incident light. NASA



N75-19628*# National Aeronautics and Space Administration. Pasadena Office, Calif.

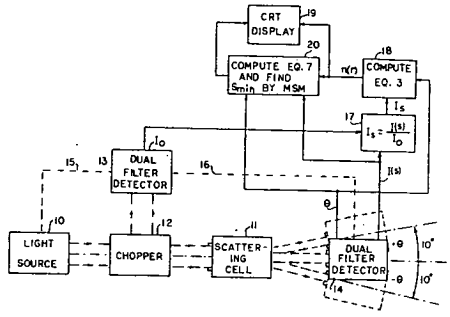
PARTICLE SIZE SPECTROMETER AND REFRACTOMETER Patent Application

Alain L. Fymat, inventor (to NASA) (JPL) Filed 26 Feb. 1975 44 p

(Contract NAS7-100)

(NASA-Case-NPO-13614-1; US-Patent-Appl-SN-553209) Avail: NTIS HC $3.75 CSCL 14B

An apparatus and method are described for simultaneously and separately reconstructing the effective spectrum of sizes and refractive indices of scattering particulates of unknown chemical composition embedded in a medium such as a liquid or gas (of any arbitrary number of species). A photometer is used which has a specified narrow field of view along near-forward scattering angles variable between approximately + or - 10 degrees, preferably + or - 7.5 degrees, and an angular resolution of approximately 15 min of arc, or less. It operates at two separate wavelengths, one of which is approximately equal to 0.7 microns, or larger, but less than or equal to the expected minimum particle radius, and the other has a substantially different value from the first by an amount of at least approximately 0.2 to 0.3 microns. NASA



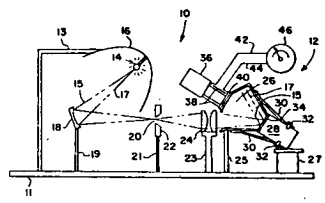
N75-19629*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

DETECTOR ABSORPTIVITY MEASURING METHOD AND APPARATUS Patent Application

Ronald E. Sheets, inventor (to NASA) (Tamarack Sci. Co., Inc., Orange, Calif.) Filed 19 Mar. 1975 10 p

(NASA-Case-LAR-10907-1; US-Patent-Appl-SN-559845) Avail: NTIS HC $3.25 CSCL 14B

A method and apparatus are described for measuring the absorptivity of a radiation detector by making the detector an integral part of a cavity radiometer. By substituting the detector for the surface of the cavity upon which the radiation first impinges, a comparison is made between the quantity of radiation incident upon the detector and the quantity reflected from the detector. The difference between the two is a measurement of the amount of radiation absorbed by the detector. NASA



36 LASERS AND MASERS

Includes parametric amplifiers.

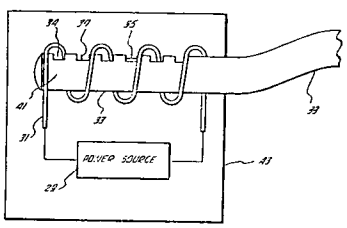
N75-13243*# National Aeronautics and Space Administration. Pasadena Office, Calif.

FIBER DISTRIBUTED FEEDBACK LASER Patent Application

Charles Elachi (JPL), Gary A. Evans (JPL), and Cavour Yeh, inventors (to NASA) (JPL) Filed 11 Dec. 1974 17 p (Contract NAS7-100)

(NASA-Case-NPO-13531-1; US-Patent-Appl-SN-531565) Avail: NTIS HC $3.25 CSCL 20E

Optical fiber lasers utilizing distributed feedback are examined for use as communication channels in optical communication networks. A laser is made of an integral part of the optical fiber channel by either diffusing active material into the optical fiber or surrounding the optical fiber with the active material. Oscillation within the active medium to produce lasing action is established by grating the optical fiber so that distributed feedback occurs. NASA



N75-15028* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

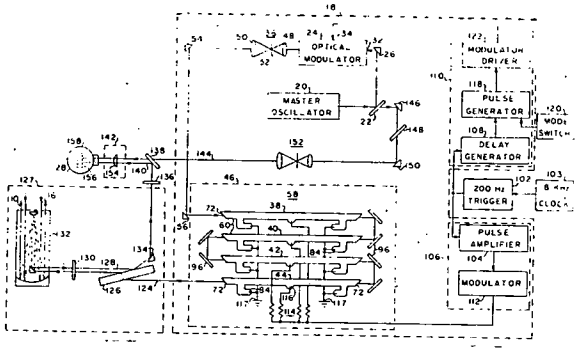
CLEAR AIR TURBULENCE DETECTOR Patent

Werner K. Dahm (Raytheon Co., Sudbury, Mass.), Donald J. Delgrego (Raytheon Co., Sudbury, Mass.), Irving Goldstein (Raytheon Co., Sudbury, Mass.), Robert M. Huffaker (Raytheon Co., Sudbury, Mass.), Albert V. Jelalian (Raytheon Co., Sudbury, Mass.), Wayne H. Keene (Raytheon Co., Sudbury, Mass.), Perry A. Miles (Raytheon Co., Sudbury, Mass.), and Charles M. Sonnenschein, inventors (to NASA) (Raytheon Co., Sudbury, Mass.) Issued 24 Dec. 1974 14 p Filed 11 Apr. 1973 Supersedes N73-21523 (11 - 12, p 1442) Sponsored by NASA

(NASA-Case-MFS-21244-1; US-Patent-3,856,402; US-Patent-Appl-SN-350249; US-Patent-Class-356-5; US-Patent-Class-356-28; US-Patent-Class-356-103) Avail: US Patent Office CSCL 20E

A system to be employed by an aircraft for the detection of clear air turbulence is described. The system employs a laser light beam which is directed ahead of the aircraft along the flight path. The portion of the light reflected back to the aircraft by atmospheric aerosol is detected and analyzed for Doppler shift. The velocity and intensity of the turbulence is determined by the type and amount of the light reflected.

Official Gazette of the U.S. Patent Office



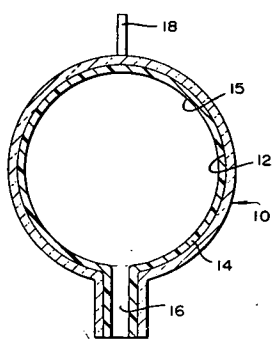
N75-15029* National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD OF PRODUCING A STORAGE BULB FOR AN ATOMIC HYDROGEN MASER Patent

Hubert Erpenbach, inventor (to NASA) (JPL) Issued 7 Jan. 1975 4 p Filed 22 Dec. 1972 Supersedes N73-18508 (11 - 09, p 1043) Sponsored by NASA

(NASA-Case-NPO-13050-1; US-Patent-3,859,119; US-Patent-Appl-SN-317567; US-Patent-Class-117-97; US-Patent-Class-117-95; US-Patent-Class-330-4; US-Patent-Class-332-7.5) Avail: US Patent Office CSCL 20E

A storage bulb for an atomic hydrogen maser is produced by coating its internal surface with an emulsion containing both TFE and FEP particles. The emulsion is produced by mixing a first quantity of TFE in an aqueous dispersion with a second quantity of FEP in an aqueous dispersion, with a third quantity of distilled water. The emulsion is poured into the bulb to coat it uniformly so as to form a thin film of emulsion on the bulb's internal surface. After excess emulsion is drained out of the bulb the emulsion in the bulb is dried to remove the water and most of the aqueous matter therefrom. The remaining emulsion is then cured by heating the bulb to a temperature of at least 380 C. Official Gazette of the U.S. Patent Office



N75-15973*# National Aeronautics and Space Administration. Pasadena Office, Calif.

SOFT X-RAY LASER USING CRYSTAL CHANNELS AS DISTRIBUTED FEEDBACK CAVITIES Patent Application

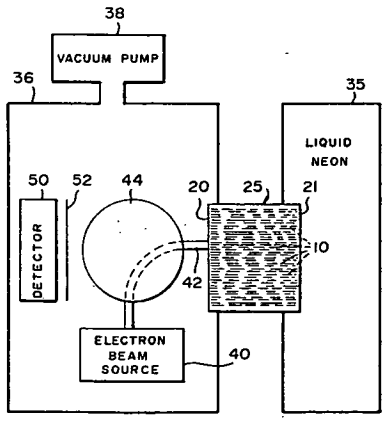
Frank J. Grunthaner, inventor (to NASA) (JPL) Filed 30 Dec. 1974 17 p

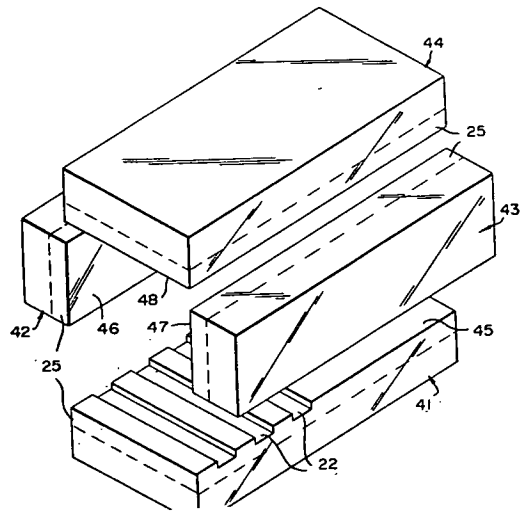
(Contract NAS7-100)

(NASA-Case-NPO-13532-1: US-Patent-Appl-SN-537473) Avail: NTIS HC $3.25 CSCL 20E

A soft X-ray laser is described using channels in a zeolite crystal as distributed feedback (DFB) cavities to produce a laser beam in the X-ray region of the spectrum. The channels have periodic changes in their cross sections such that Bragg-type reflections are generated, leading to DFB of a wave of X-ray photons of lambda = 14.61A, emitted form neon undergoing the characteristic excitation K alpha sub 1,2. Cold neon is forced by a pressure differential through the crystal's channels in one direction, while a beam of electrons sufficient kinetic energy is directed into the channels opposite the neon flow, to excite the neon to emit the X-ray photons at lambda = 14.61A. Using an electron beam with a cross section on the order of 1 micron, an X-ray beam of comparable cross section is emitted from channels of the zeolite crystal in which the excitation of neon takes place.

NASA





N75-16827*# National Aeronautics and Space Administration. Pasadena Office, Calif.

REFLECTED WAVE MASER Patent Application

Robert C. Clauss, inventor (to NASA) (JPL) Filed 12 Feb. 1975 23 p

(Contract NAS7-100)

(NASA-Case-NPO-13490-1; US-Patent-Appl-SN-549418) Avail: NTIS HC $3.25 CSCL 20E

The design and operation of a two-direction reflected-wave maser that exhibits a net gain characteristic that is equivalent to a prior art traveling-wave maser of more than twice the length is described. By cascading stages and immersing the slow-wave structures in a nonuniform magnetic field, a reflected-wave maser amplifier that has exceptionally wide bandwidth while maintaining a gain comparable to prior art traveling wave maser amplifiers is realized.

NASA

N75-15974*# National Aeronautics and Space Administration. Pasadena Office, Calif.

DIFFUSED WAVEGUIDING CAPILLARY TUBE WITH DISTRIBUTED FEEDBACK FOR A GAS LASER Patent Application

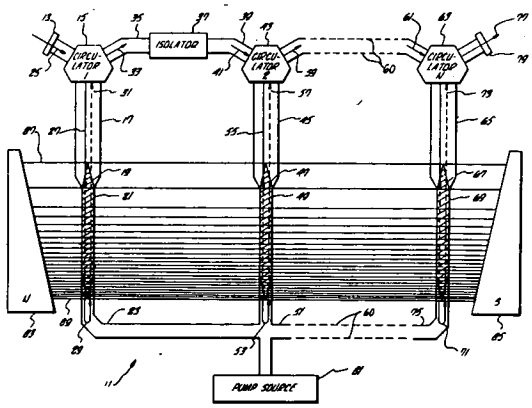
Charles Elachi, inventor (to NASA) (JPL) Filed 17 Dec. 1974 17 p

(Contract NAS7-100)

(NASA-Case-NPO-13544-1; US-Patent-Appl-SN-533555) Avail: NTIS HC $3.25 CSCL 20E

A description is given of an improved capillary tube in a waveguide gas laser, in which at least a portion of the tube's opening, defined by its inner surface, is corrugated to provide distributed feedback. The tube also has a diffused region which acts as a waveguide for the waves: The evanescent component of the waves travelling in the diffused region interact with laser gas in the opening causing an energy increase which in turn amplify waves travelling in the region.

NASA



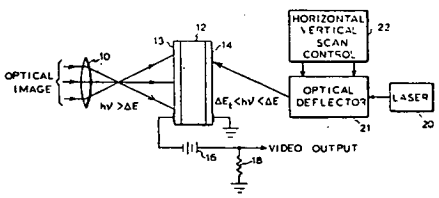
N75-19652* National Aeronautics and Space Administration. Pasadena Office, Calif.

DEEP TRAP, LASER ACTIVATED IMAGE CONVERTING SYSTEM Patent

Joseph Maserjian, inventor (to NASA) (JPL) Issued 11 Feb. 1975 6 p Filed 22 Aug. 1973 Supersedes N73-31467 (11 - 22, p 2680 Sponsored by NASA

(NASA-Case-NPO-13131-1; US-Patent-3,865,975; US-Patent-Appl-SN-390468; US-Patent-Class-178-7.1; US-Patent-Class-250-211R; US-Patent-Class-250-578; US-Patent-Class-315-169R; US-Patent-Class-340-173LS) Avail: US Patent Office CSCL 20E

Receiving an optical image on the surface of a photoconducting semiconductor is presented, storing the image in deep traps of the semiconductor, and later scanning the semiconductor with a laser beam to empty the deep traps, thereby producing a video signal. The semiconductor is illuminated with photons of energy greater than the band gap producing electron-hole pairs in the semiconductor which subsequently fill traps in energy from the band edges. When the laser beam of low energy photons excites the trapped electrons and holes out of the traps into the conduction and valence bands, a photoconductivity can be observed. Official Gazette of the U.S. Patent Office



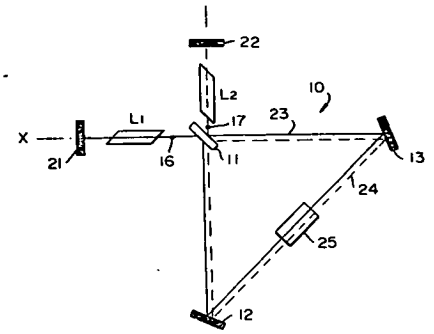
N75-19653* National Aeronautics and Space Administration, Washington, D.C.

LASER SYSTEM WITH AN ANTIRESONANT OPTICAL RING Patent

Anthony E. Siegman, inventor (to NASA) (Stanford Univ.) Issued 4 Mar. 1975 9 p Filed 2 Nov. 1973 Supersedes N74-20118 (12 - 11, p 1303) Sponsored by NASA

(NASA-Case-HQN-10844-1; US-Patent-3,869,210; US-Patent-Appl-SN-412080; US-Patent-Class-356-106LR) Avail: US Patent Office CSCL 20E

Various applications of an antiresonant ring, consisting of a beam splitter and a number of optical reflectors, are described. With a beam splitter having a transmission coefficient and a reflection coefficient, an optical beam incident on the beam splitter along a first axis is split into two components which circulate around the ring in opposite directions. They are recombined to reflect back the beam along the first axis, with none of the beam power being directed along a second axis. The ring can be part of the cavity of two otherwise independent lasers, with two separate laser mediums external to the ring, or with a multi-wavelength laser medium in the ring. The ring together with a second-harmonic generation crystal and a dispersive phase shifter in the ring can generate the second harmonic of an optical beam. Official Gazette of the U.S. Patent Office



N75-19654* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

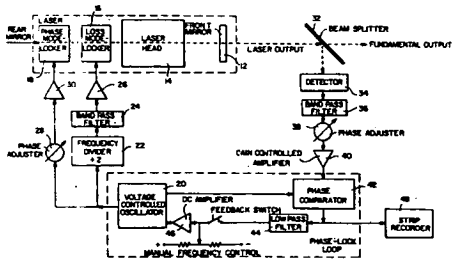
DUALLY MODE LOCKED Nd:YAG LASER Patent

John Osmundson (NAS-NRC), H. Edward Rowe (NAS-NRC), and Dominick Santarpia, inventors (to NASA) (NAS-NRC) Issued 4 Mar. 1975 6 p Filed 31 Aug. 1973 Supersedes N73-32398 (11 - 23, p 2800) Sponsored by NASA

(NASA-Case-GSC-11746-1; US-Patent-3,869,680; US-Patent-Appl-SN-393528; US-Patent-Class-331-94.5M) Avail: US Patent Office CSCL 20E

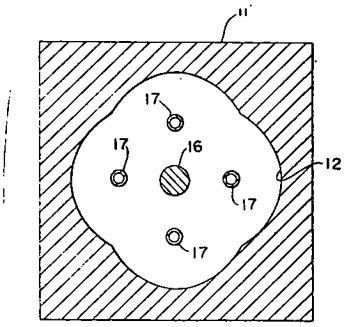
A dually mode locked laser system is disclosed: the laser system is of the general type including a laser cavity defined by a pair of at least partially reflecting mirrors with a laser material disposed in the cavity. A loss modulator mode locking element and a phase modulator mode locking element are disposed in the laser cavity in optical series with one another. Modulation drive signals are provided for each mode locking element such that each element produces an output pulse train of substantially the same repetition rate and where the output pulse train is in a timed interrelationship such that the pulses pass through both mode locking elements without being extinguished. The loss mode locker is driven at a low level so that relaxation oscillations do not occur and forces the pulses generated by the phase mode locker to maintain a constant phase relative to the mode lock drive signal. The laser system can be run both open loop and with a phase lock stabilization feedback loop.

Official Gazette of the U.S. Patent Office



N75-19655* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
LASER HEAD FOR SIMULTANEOUS OPTICAL PUMPING OF SEVERAL DYE LASERS Patent
Peter B. Mumola and Belton T. McAlexander, inventors (to NASA) Issued 25 Feb. 1975 6 p Filed 5 Jun. 1973 Supersedes N73-25564 (11 - 16, p 1923)
(NASA-Case-LAR-11341-1; US-Patent-3,868,591; US-Patent-Appl-SN-367293; US-Patent-Class-331-94.5P; US-Patent-Class-330-4-3) Avail: US Patent Office CSCL 20E

The invention is a laser head for simultaneous pumping several dye lasers with a single flash lamp. The laser head includes primarily a multi-elliptical cylinder cavity with a single flash lamp placed along the common focal axis of the cavity and with capillary tube dye cells placed along each of the other focal axes of the cavity. The inside surface of the cavity is polished. Hence, the single flash lamp supplies the energy to the several dye cells. Official Gazette of the U.S. Patent Office

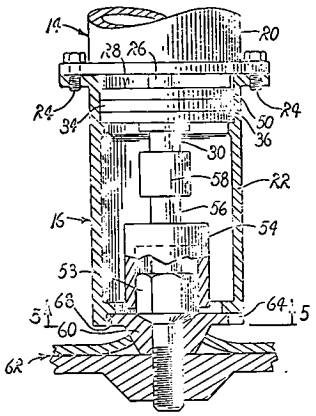


37 MECHANICAL ENGINEERING

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

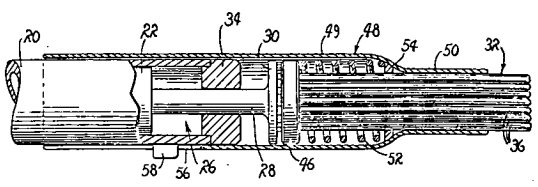
N75-10456*# National Aeronautics and Space Administration. Pasadena Office, Calif.
ZERO TORQUE GEAR HEAD WRENCH Patent Application
Allan R. McDougal, inventors (to NASA) (JPL) and Robert M. Norman (JPL) Filed 10 Oct. 1974 18 p
(Contract NAS7-100)
(NASA-Case-NPO-13059-1; NASA-Case-NPO-13436-1; US-Patent-Appl-SN-513690) Avail: NTIS HC $3.25 CSCL 13I

A gear head wrench, particularly suited for use in applying torque to bolts without transferring torsional stresses to bolt-receiving structures, is presented. The wrench is characterized by a coupling including a socket, for connecting a bolt head with a torque multiplying gear-train, the gear-train is present in a housing with an annulus concentrically related to the socket and adapted to be coupled with a spacer interposed between the bolt head and the juxtaposed surface of the bolt-receiving structure. The bolt-receiving structure applies a balancing counter-torque to the spacer as torque is applied to the bolt head whereby the bolt-receiving structure is substantially isolated from torsional stress. As a result of the foregoing, the operator of the wrench is substantially isolated from any forces which may be imposed. NASA



N75-10459*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AN IMPROVED PORTABLE PEENING GUN Patent Application
Vincent P. Caruso and Elbert J. Minter, inventors (to NASA) Filed 6 Nov. 1974 14 p
(NASA-Case-MFS-23047-1; US-Patent-Appl-SN-521602) Avail: NTIS HC $3.25 CSCL 13I

An improved portable peening gun is described which is characterized by a pneumatic motor, an axially reciprocable hammer to be driven by the motor from an initial position along a linear path, and an improved peening head which includes an axially reciprocable rod bundle coaxially aligned with the hammer and disposed within the path. The improved head includes a plurality of peening rods, each being characterized by an anvil defined at one end for receiving the hammer upon impacting engagement, and a peening surface defined at the other end which conforms to a segment of a sphere having a radius substantially equal to one-half the thickness of the rod. A barrel for supporting the rod bundle for axial reciprocation is included, along with a helical spring disposed within the barrel for urging the bundle in displacement toward its initial position. NASA



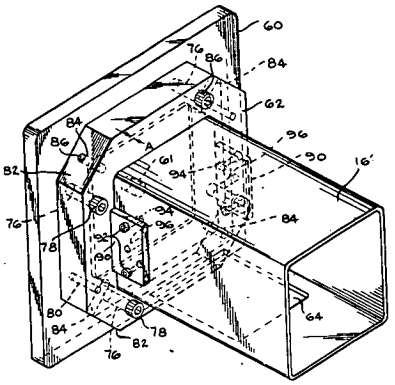
N75-11351*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

FLANGED MAJOR MODULAR ASSEMBLY JUG Patent Application

Meyer M. Gilman, inventor (to NASA) (Rockwell Intern. Corp.) Filed 25 Oct. 1974 30 p

(NASA-Case-MSC-19372-1; US-Patent-Appl-SN-517995) Avail: NTIS HC $3.75 CSCL 13I

The invention presents methods and means for attaching flanges to three-dimensional frameworks, called major modular assembly jigs, the word major implying a structure of some size while modular is intended to connote that two or more jigs are to be assembled to make a complete tooling and assembly jig. The overall assembly of modules provides working platforms and reference points and plates for the assembly and tool operation upon such large structures as spacecraft, aircraft, sea-going vessels and rail cars. NASA



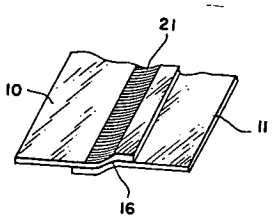
N75-12326* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

METHOD OF MAKING AN EXPLOSIVELY WELDED SCARF JOINT Patent

Lawrence J. Bement, inventor (to NASA) Issued 22 Oct. 1974 4 p Filed 1 Nov. 1972 Supersedes N73-14480 (11 - 05, p 0552)

(NASA-Case-LAR-11211-1; US-Patent-3,842,485; US-Patent-Appl-SN-302681; US-Patent-Class-29-470.1; US-Patent-Class-29-475) Avail: US Patent Office CSCL 13H

A method is presented for obtaining a bond joint between thin metal members without the addition of a bonding agent. The method yields bond strengths comparable to the parent metal. The method comprises overlapping the materials at the edges and bonding them by explosive welding while also making use of the explosive force to shape the materials into an essentially planar configuration. Official Gazette of the U.S. Patent Office



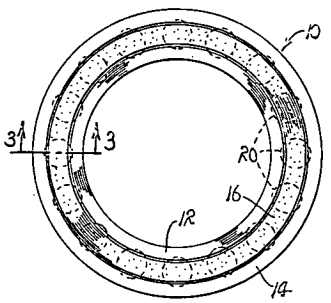
N75-12328*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

A SELF-LUBRICATING BEARING Patent Application

Ann F. Whitaker, inventor (to NASA) Filed 11 Nov. 1974 11 p

(NASA-Case-MFS-23009-1; US-Patent-Appl-SN-522557) Avail: NTIS HC $3.25 CSCL 13I

An improved bearing structure is described which includes a permanently magnetized porous body filled with an interstitial magnetic lubricant for extending the operational life of self-lubricating bearings. The bearing structure is characterized by a permanently magnetized retainer formed of a porous material and filled with an interstitial magnetic lubricant, whereby the pores serve as lubricant reservoirs from which the lubricant continuously is delivered to a film disposed between contiguous bearing surfaces. NASA



N75-13261* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

METHOD OF PROTECTING THE SURFACE OF A SUBSTRATE Patent

Michael A. Gedwill, inventor (to NASA) and Salvatore J. Grisaffe Issued 26 Nov. 1974 5 p Filed 16 Oct. 1972 Supersedes N73-10502 (11 - 01, p 0061)

(NASA-Case-LEW-11696-1; US-Patent-3,849,865; US-Patent-Appl-SN-298156; US-Patent-Class-29-460; US-Patent-Class-29-196.6; US-Patent-Class-29-197; US-Patent-Class-29-494; US-Patent-Class-29-497.5; US-Patent-Class-29-504) Avail: US Patent Office CSCL 13H

The surface of a metallic base system is initially coated with a metallic alloy layer that is ductile and oxidation resistant. An aluminide coating is then applied to the metallic alloy layer. The chemistry of the metallic alloy layer is such that the oxidation resistance of the subsequently aluminized outermost layer is not seriously degraded. Official Gazette of the U.S. Patent Office

N75-13265* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

VARIABLE RESISTANCE CONSTANT TENSION AND LUBRICATION DEVICE Patent

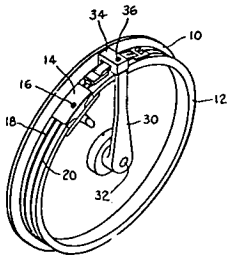
Henry J. Smith, inventor (to NASA) (Boeing Co., Cocoa Beach, Fla.) Issued 10 Dec. 1974 7 p Filed 4 Apr. 1973 Supersedes N73-23553 (11 - 14, p1670) Sponsored by NASA

(NASA-Case-KSC-10723-1; US-Patent-3,854,113; US-Patent-Appl-SN-347952; US-Patent-Class-338-75; US-Patent-Class-338-97; US-Patent-Class-338-162) Avail: US Patent Office CSCL 13I

A variable resistance device is described which includes a cylindrical housing having elongated resistance wires. A movable arm having a supporting block carried on the outer end is rotatably carried by the cylindrical housing. An arcuate steel spring member is pivotally supported by the movable arm. A leather wiper member is carried adjacent to one end of the spring steel member, and

an electrically conductive surface is carried adjacent to the other end. The supporting block maintains the spring steel member in compression so that a constant pressure is applied to the conductive end of the spring steel member and the leather wiper. The leather wiper is saturated with a lubricating oil for maintaining the resistance wire clean as the movable arm is manipulated.

Official Gazette of the U.S. Patent Office



N75-13266* National Aeronautics and Space Administration. Pasadena Office, Calif.

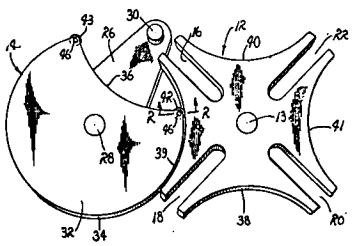
GENEVA MECHANISM Patent Application

Robert H. Summers (JPL) and Ralph L. Kenney, inventors (to NASA) (JPL) Filed 24 Dec. 1974 5 p Filed 2 Nov. 1973 Supersedes N74-23071 Sponsored by NASA

(NASA-Case-NPO-13281-1; US-Patent-3,855,873; US-Patent-Appl-SN-412079; US-Patent-Class-74-436; US-Patent-Class-74-820) Avail: US Patent Office (12 - 14, p 1679) CSCL 13I

An improved Geneva mechanism is characterized by a driven star-wheel having a segmented cam-follower surface. Star-wheel driver includes a restraining cam having a segmented cam surface for engaging the cam-follower surface of the star-wheel and antifriction rollers pinned to the restraining cam for engaging the cam-follower surface.

Official Gazette of the U.S. Patent Office



N75-13268*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

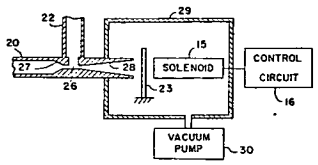
SERVO VALVE Patent Application

Howell D. Garner, inventor (to NASA) Filed 11 Dec. 1974 11 p

(NASA-Case-LAR-11643-1; US-Patent-Appl-SN-531649) Avail: NTIS HC $3.25 CSCL 13K

The development and characteristics of a servo valve for controlling the flow of gaseous or hydraulic fluids to servo motors are discussed. A venturi-shaped arrangement is used in which the pressure change to the servo is as great as twice the supply pressure. There is a linear relation between the position of the flapper valves relative to the end of the first conduit and the pressure applied to the servo. Diagrams of the device are provided.

NASA



N75-14131*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

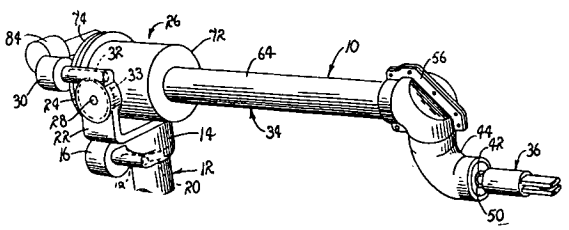
A REMOTELY OPERABLE ARTICULATED MANIPULATOR Patent Application

Ray E. Marlow, inventor (to NASA) (Sperry Rand Corp.) Filed 23 Dec. 1974 23 p Sponsored by NASA

(NASA-Case-MFS-22707-1; US-Patent-Appl-SN-535410) Avail: NTIS HC $3.25 CSCL 13I

The manipulator includes a plurality of serially connected drive shafts, having a grasping device mounted at the distal end of the ultimate drive shaft of the plurality. A plurality of joints is also included with meshed pairs of beveled gears 61 and 70 interconnecting the drive shafts. A plurality of drive tubes are concentrically related to the drive shafts and interconnected through meshed level gears for imparting angular displacement.

NASA



N75-14132*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

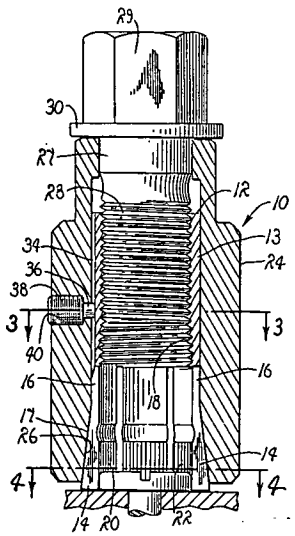
A DEVICE RESPONSIVE TO APPLIED TORQUE FOR GRASPING AN ELONGATED, EXTERNALLY THREADED BODY AS THE BODY IS EXTRACTED FROM AN INTERNALLY THREADED OPENING Patent Application

Kenneth Daniels (Martin Marietta Corp.), Leo Rothermel (Martin Marietta Corp.), and Dennis E. Herrick, inventors (to NASA) (Martin Marietta Corp.) Filed 11 Dec. 1974 13 p Sponsored by NASA

(NASA-Case-MFS-22957-1; US-Patent-Appl-SN-531648) Avail: NTIS HC $3.25 CSCL 13I

The device is characterized by a collet having a tubular body terminating in an annular array of flexible fingers having

an internal surface defining an annulus for concentrically receiving the body. An external surface of a frusto-conical configuration and an elongated sleeve are described. NASA



N75-15050* National Aeronautics and Space Administration. Pasadena Office, Calif.

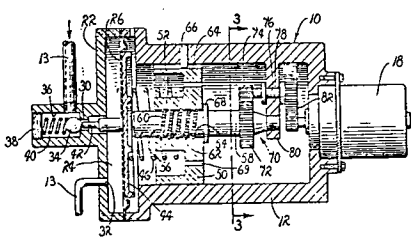
COMBINED PRESSURE REGULATOR AND SHUTOFF VALVE Patent

Edgar F. Koch, inventor (to NASA) (JPL) Issued 24 Dec. 1974 5 p Filed 21 Jun. 1973 Supersedes N73-26474 (11 - 17, p 2036) Sponsored by NASA

(NASA-Case-NPO-13201-1; US-Patent-3,856,042; US-Patent-Appl-SN-372149; US-Patent-Class-137-505.42; US-Patent-Class-74-424.8VA; US-Patent-Class-137-505.38) Avail: US Patent Office CSCL 13K

A remotely operable pressure regulator and shutoff valve particularly suited for achieving high resolution and flow control, and positive shutoff is described. The valve is characterized by a spring-loaded ball coaxially aligned with a fluid port to be sealed, a spring-loaded pintle extended through the port into engagement with the ball, for controlling the position, a spring-loaded diaphragm for controlling the position of the pintle, and an axially displaceable spring supported by a movable stop which, in turn, is repositioned by a selectively operable stepper motor. Thus, the pressure-response characteristics for the valve can be varied through a selective repositioning of the stop.

Official Gazette of the U.S. Patent Office



N75-15055*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

A METHOD AND A SYSTEM FOR EXTINGUISHING A FIRE WITHIN A SEALED BATTERY Patent Application

William J. Britz and William A. Boshers, inventors (to NASA) Filed 27 Dec. 1974 13 p

(NASA-Case-MFS-22952-1; US-Patent-Appl-SN-537025) Avail: NTIS HC $3.25 CSCL 13L

A method for extinguishing fires in electric batteries, particularly silver/zinc batteries, is described. The system consists of a vacuum manifold connected to the battery compartment and electrically actuated valves which operate in response to high temperatures. Opening the valve causes the combustion supporting gases to be evacuated from the battery housing and the fire is extinguished. The system may be used with ground support equipment as well as aboard spacecraft. NASA

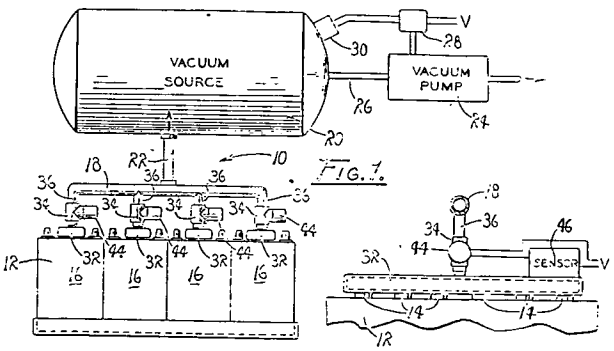


FIG. 1

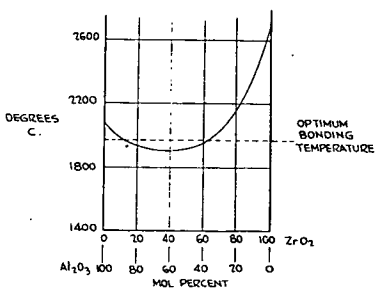
N75-16992* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

BONDING OF SAPPHIRE TO SAPPHIRE BY EUTECTIC MIXTURE OF ALUMINUM OXIDE AND ZIRCONIUM OXIDE Patent

John J. DeLuca, inventor (to NASA) Issued 14 Jan. 1975 4 p Filed 12 Jan. 1973 Supersedes N73-19467 (11 - 10, p 1164)

(NASA-Case-GSC-11577-1; US-Patent-3,859,714; US-Patent-Appl-SN-322997; US-Patent-Class-29-472.7; US-Patent-Class-65-43; US-Patent-Class-156-89; US-Patent-Class-156-99; US-Patent-Class-117-93.3; US-Patent-Class-117-106A; US-Patent-Class-29-473.1) Avail: US Patent Office CSCL 13H

Bonding of an element comprising sapphire, ruby or blue sapphire to another element of such material with a eutectic mixture of aluminum oxide and zirconium oxide is discussed. The bonding mixture may be applied in the form of a distilled water slurry or by electron beam vapor deposition. In one embodiment the eutectic is formed in situ by applying a layer of zirconium oxide and then heating the assembly to a temperature above the eutectic temperature and below the melting point of the material from which the elements are formed. The formation of a sapphire rubidium maser cell utilizing eutectic bonding is shown. Official Gazette of the U.S. Patent Office



N75-15994*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

PRELOAD TORQUE LIMITING SHAFT COUPLING Patent Application

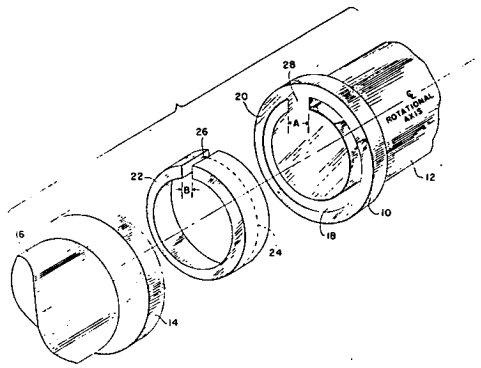
Wayne A. Harmening, inventor (to NASA) (RCA) Filed 17 Jan. 1975 8 p

(Contract NAS1-9000)

(NASA-Case-LAR-11398-1; US-Patent-Appl-SN-541822) Avail: NTIS HC $3.25 CSCL 13I

A torque limiting spring for a rotating shaft system which acts bidirectionally and is preloaded is examined. The spring is a split circular ring compressed into cavities on facing surfaces of matching shafts. The spring is preloaded by varying the width of a tang in the shaft cavity relative to the split in the spring.

NASA



N75-18573* National Aeronautics and Space Administration. Pasadena Office, Calif.

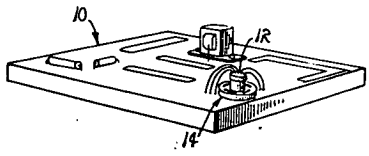
SHOCK ABSORBING MOUNT FOR ELECTRICAL COMPONENTS Patent

Robert F. Dillon, Jr. (JPL) and Robert C. Mayne, inventors (to NASA) (JPL) Issued 4 Feb. 1975 5 p Filed 10 Sep. 1973 Supersedes N73-31445 (11 - 22, p 2677) Sponsored by NASA

(NASA-Case-NPO-13253-1; US-Patent-3,863,881; US-Patent-Appl-SN-395687; US-Patent-Class-248-358R) Avail: US Patent Office CSCL 20/11

A shock mount for installing electrical components on circuit boards is described. The shock absorber is made of viscoelastic material which interconnects the electrical components. With this system, shocks imposed on one component of the circuit are not transmitted to other components. A diagram of a typical circuit is provided.

P.N.F.



N75-18574* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

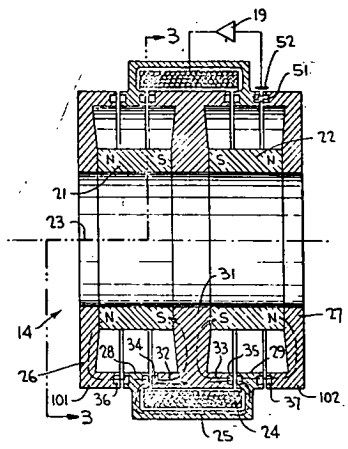
MAGNETIC BEARING Patent

Philip A. Studer, inventor (to NASA) Issued 11 Feb. 1975 6 p Filed 22 Dec. 1970 Supersedes N71-28461 (09 - 16, p 2629)

(NASA-Case-GSC-11079-1; US-Patent-3,865,442; US-Patent-Appl-SN-100637; US-Patent-Class-308-10) Avail: US Patent Office CSCL 13I

A magnetic bearing is described which includes a pair of coaxial, toroidal, and permanent magnets having axially directed poles. Like poles of the permanent magnets are adjacent to each other, whereby the permanent magnets have a tendency to be urged apart along the common axis. An electromagnet is wound coaxially with the permanent magnets in such a manner that the poles are axially directed. Between the poles of each permanent magnet there is a low magnetic reluctance circuit including two series air gaps. Between the poles of the electromagnet a low reluctance path including only one air gap of each of the low magnetic reluctance circuits is provided. The low reluctance path for the electromagnet includes a ring axially translatable relative to the permanent magnets. The ring forms opposite faces of the air gaps in the magnetic circuits for each permanent magnet.

Official Gazette of the U.S. Patent Office



N75-18576*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

FLUID SEAL FOR ROTATING SHAFTS Patent Application

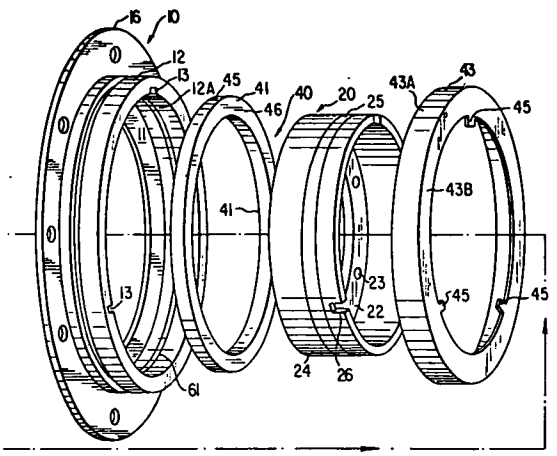
Lawrence P. Ludwig, inventor (to NASA) Filed 19 Feb. 1975 14 p

(NASA-Case-LEW-11676-1; US-Patent-Appl-SN-551184) Avail: NTIS HC $3.25 CSCL 11A

An improved fluid seal for a rotating shaft is provided which includes an inner annular ring or runner adapted to be secured to the rotating shaft and a composite sealing ring which is keyed to the inner ring and includes a radial sealing surface. An outer, nonrotating, annular ring or housing which is concentrically disposed with respect to the runner and sealing ring, includes a radial sealing surface which sealingly engages the sealing surface of the sealing ring. A circular wave spring, which is anchored to the housing and is disposed between the composite sealing ring and a snap ring secured to the housing, provides an axial force which forces the two sealing surfaces into sealing contact.

The waves of the spring act as individual hydrodynamic bearings, and the axial force is transmitted across an oil film. This eliminates rubbing contact and the need for a separate thrust bearing.

NASA



N75-19683* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

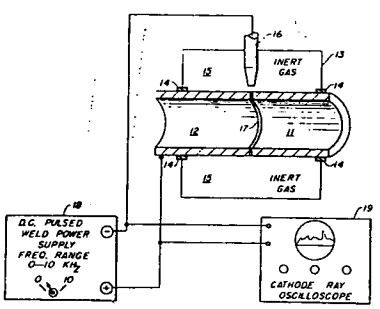
GRAIN REFINEMENT CONTROL IN TIG ARC WELDING Patent

William F. Iceland (N. Am. Rockwell Corp., Downey, Calif.) and Edwin L. Whiffen, inventors (to NASA) (N. Am. Rockwell Corp., Downey, Calif.) Issued 4 Feb. 1975 5 p Filed 13 Nov. 1973 Supersedes N74-32925 (12 - 22, p 2701) Sponsored by NASA

(NASA-Case-MSC-19095-1; US-Patent-3,864,542; US-Patent-Appl-SN-415486; US-Patent-Class-219-137) Avail: US Patent Office CSCL 13H

A method for controlling grain size and weld puddle agitation in a tungsten electrode inert gas welding system to produce fine, even grain size and distribution is disclosed. In the method the frequency of dc welding voltage pulses supplied to the welding electrode is varied over a preselected frequency range and the arc gas voltage is monitored. At some frequency in the preselected range the arc gas voltage will pass through a maximum. By maintaining the operating frequency of the system at this value, maximum weld puddle agitation and fine grain structure are produced.

Official Gazette of the U.S. Patent Office



N75-19684* National Aeronautics and Space Administration. Pasadena Office, Calif.

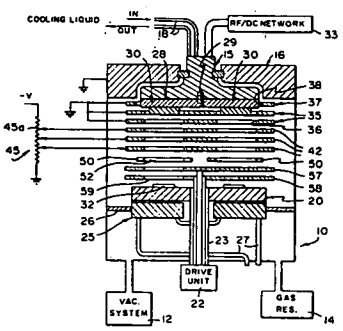
MULTITARGET SEQUENTIAL SPUTTERING APPARATUS Patent

Rindge Shima, inventor (to NASA) (JPL) Issued 4 Feb. 1975 8 p Filed 22 Apr. 1974 Supersedes N74-25971 (12 - 15, p 1794) Sponsored by NASA

(NASA-Case-NPO-13345-1; US-Patent-3,864,239; US-Patent-APPL-SN-462705; US-Patent-Class-204-298; US-Patent-Class-204-192) Avail: US Patent Office CSCL 13H

The development and characteristics of a sputtering apparatus are discussed. A potential difference is applied between the cathode and anode to produce a plasma for each target which is sputtered by accelerated ions within the plasma. The process of sputtering for various materials is described. Diagrams of the unit are provided.

P.N.F.



N75-19685* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

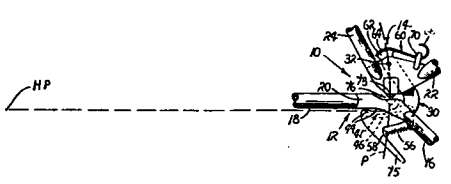
LATCHING DEVICE Patent

George W. Ulrich, inventor (to NASA) (McDonnell-Douglas Corp., Huntington Beach, Calif.) Issued 4 Mar. 1975 6 p Filed 2 May 1973 Supersedes N73-22417 (11 - 13, p 1532) Sponsored by NASA

(NASA-Case-MFS-21606-1; US-Patent-3,869,160; US-Patent-Appl-SN-356555; US-Patent-Class-292-108; US-Patent-Class-292-122; US-Patent-Class-292-DIG.14) Avail: US Patent Office CSCL 15E

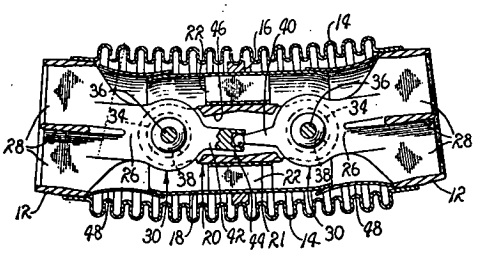
A latching device is suited for use in establishing a substantially motionless connection between a stationary receiver and a movable latching mechanism. The latching mechanism includes a pivotally supported restraining hook continuously urged into a capturing relationship with the receiver, characterized by a spring-biased pawl having a plurality of aligned teeth. The teeth are seated in the surface of the throat of the hook and positionable into restraining engagement with a rigid restraining shoulder projected from the receiver.

Official Gazette of the U.S. Patent Office



N75-19686* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
INTERNALLY SUPPORTED FLEXIBLE DUCT JOINT Patent
Ralph F. Kuhn, Jr., inventor (to NASA) (Rocketdyne, Canoga Park, Calif.) Issued 4 Mar. 1975 5 p Filed 16 Apr. 1974 Supersedes N74-22145 (12 - 13, p 1561) Sponsored by NASA
(NASA-Case-MFS-19193-1; US-Patent-3,869,151; US-Patent-Appl-SN-461477; US-Patent-Class-285-114; US-Patent-Class-285-226) Avail: US Patent Office CSCL 13G

An internally supported, flexible duct joint for use in conducting fluids under relatively high pressures in systems where relatively large deflection angles must be accommodated is presented. The joint includes a flexible tubular bellows and an elongated base disposed within the bellows. The base is connected through radiating struts to the bellows near mid-portion and to each of the opposite end portions of the bellows through a pivotal connecting body. A motion-controlling linkage is provided for linking the connecting bodies, whereby angular displacement of the joint is controlled and uniformity in the instantaneous bend radius of the duct is achieved as deflection is imposed.
Official Gazette of the U.S. Patent Office



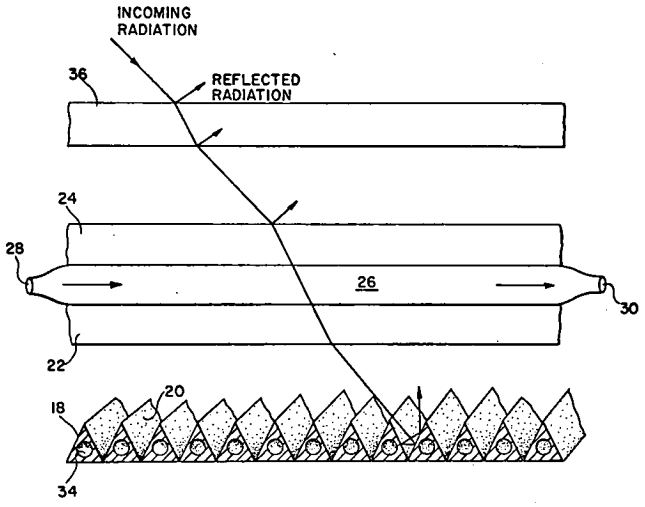
44 ENERGY PRODUCTION AND CONVERSION

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

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

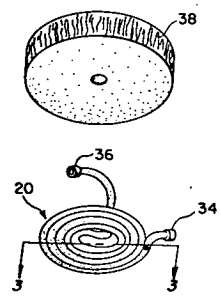
N75-10585*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SOLAR ENERGY ABSORBER Patent Application
Lott W. Brantley, Jr., inventor (to NASA) Filed 29 Oct. 1974 15 p
(NASA-Case-MFS-22743-1; US-Patent-Appl-SN-518684) Avail: NTIS HC $3.25 CSCL 10A

A solar energy absorber, including a tubular absorber surface through which a fluid passes for transferring thermal energy layer is vacuum or air for minimizing thermal energy losses through convection. A clear liquid passes between two intermediate layers of glass for transferring, by means of conduction, the thermal energy absorbed by either the initial passage of the visible spectrum of electromagnetic rays or by infrared radiation radiated from an absorber positioned below. Author



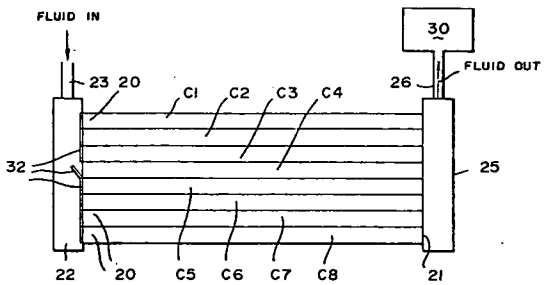
N75-10586*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SOLAR ENERGY TRAP Patent Application
Lott W. Brantley, Jr., inventor (to NASA) Filed 29 Oct. 1974 16 p
(NASA-Case-MFS-22744-1; US-Patent-Appl-SN-518544) Avail: NTIS HC $3.25 CSCL 10A

An apparatus is provided for trapping solar energy emitted from the sun for heating a fluid that could be subsequently used in turbines and the like. The apparatus includes an elongated vertical light pipe having an open end through which the visible spectrum of electromagnetic radiation from the sun passes to strike a tubular absorber carried adjacent the other end. The light pipe has a coated interior surface of a low absorptivity and a high reflectivity at the visible wave lengths and a high absorptivity/emissivity ratio at infrared wave lengths. The tubular absorber has a coating on the surface for absorbing visible wave lengths so as to heat the fluid passing through. Infrared wave lengths are radiated from the tubular absorber back into the light pipe for heating fluid passing through a tubular coil wound thereon. NASA



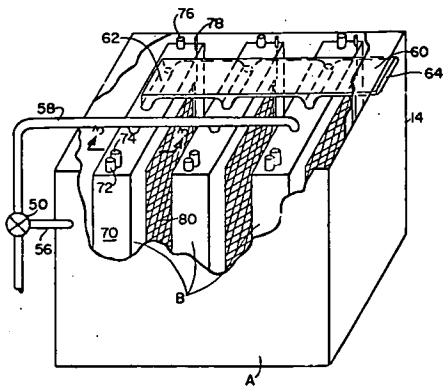
N75-12429*# National Aeronautics and Space Administration. Pasadena Office, Calif.
THERMOSTATICALLY CONTROLLED NONTRACKING TYPE SOLAR ENERGY CONCENTRATOR Patent Application
Katsunori Shimada, inventor (to NASA) (JPL) Filed 22 Nov. 1974 21 p
(Contract NAS7-100)
(NASA-Case-NPO-13497-1; US-Patent-Appl-SN-526448) Avail: NTIS HC $3.25 CSCL 10A

A solar energy concentrator is described which comprises an array of cylindrical Fresnel lenses, all of which are fixedly aligned in the East-West direction. Each lens concentrates the sun rays and forms a line image which extends in the East-West direction. Below the lenses are individual fluid channels which extend in the East-West direction and are spaced apart in the South-North direction. Each line image focuses onto two of the channels which absorb heat of the concentrated sun rays. Each channel has a thermostatically controlled valve for regulating fluid flow through the channel. NASA



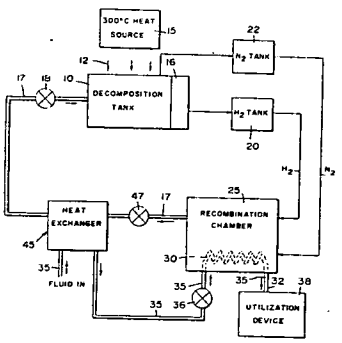
N75-16078*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
LEAD-OXYGEN dc POWER SUPPLY SYSTEM Patent Application
William J. Britz, William A. Boshers, and James J. Kaufmann, inventors (to NASA) Filed 27 Dec. 1974 21 p
(NASA-Case-MFS-23059-1; US-Patent-Appl-SN-537024) Avail: NTIS HC $3.25 CSCL 10C

A pollution-free, closed-loop electrical power system using a lead-oxygen battery to supply power for lightweight vehicles is described. The battery system is completely sealed and no outgassing occurs during operation. The system consists of the lead-oxygen battery, a positive charging grid, a conventional negative terminal, a positive discharging electrode, and a Teflon membrane member coated with a catalyst. The system is contained in an atmosphere of oxygen which is admitted to the cell through the Teflon membrane. Oxygen is given off during the charging cycle of the battery and is compressed in a storage tank for re-use during each duty cycle thus providing a closed system in which contamination is minimized and a long-life cycle is maintained. NASA



N75-16972*# National Aeronautics and Space Administration. Pasadena Office, Calif.
LOW TO HIGH TEMPERATURE ENERGY CONVERSION SYSTEM Patent Application
Charles G. Miller, inventor (to NASA) (JPL) Filed 27 Dec. 1974 24 p
(Contract NAS7-100)
(NASA-Case-NPO-13510-1; US-Patent-Appl-SN-536786) Avail: NTIS HC $3.25 CSCL 10A

A low to high temperature energy conversion system is described which includes a decomposition chamber in which ammonia (NH3) is decomposed into hydrogen and nitrogen by absorbing heat of decomposition from a low temperature (300 C) energy source. The separated hydrogen and nitrogen are then supplied to a recombination chamber where they recombine to produce ammonia. The recombination process is associated with a significant increase in temperature, used to increase the temperature of a fluid to temperatures on the order of 550 C. NASA



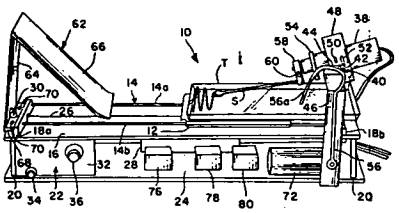
51 LIFE SCIENCES (GENERAL)

Includes genetics.

N75-13502* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AUTOMATIC INOCULATING APPARATUS Patent
Judd R. Wilkins and Stacey M. Mills, inventors (to NASA) Issued 26 Nov. 1974 10 p Filed 24 Jan. 1973 Supersedes N73-16096 (11 - 07, p 0750)
(NASA-Case-LAR-11074-1; US-Patent-3,850,754; US-Patent-Appl-SN-326364; US-Patent-Class-195-127-; US-Patent-Class-195-120; US-Patent-Class-115-103.5) Avail: US Patent Office CSCL 06B

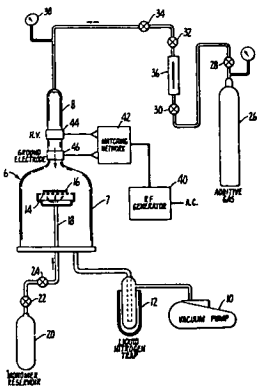
An automatic inoculating apparatus for agar trays is described and using a simple inoculating element, such as a cotton swab or inoculating loop. The apparatus includes a movable carriage for supporting the tray to be inoculated, a drive motor for moving the tray along a trackway, and a swabbing motor for automatically swabbing the tray during the movement. An actuator motor controls lowering of the inoculating element onto the tray and

lifting of the inoculating element. An electrical control system, including limit microswitches, enables automatic control of the actuator motor and return of the carriage to the initial position after inoculating is completed.
Official Gazette of the U.S. Patent Office



N75-13506*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
WATER PURIFICATION PROCESS Patent Application
John R. Hollahan and Theodore Wydeven, inventors (to NASA) Filed 6 Nov. 1974 15 p
(NASA-Case-ARC-10643-2; US-Patent-Appl-SN-521619) Avail: NTIS HC $3.25 CSCL 06I

A reverse osmosis process for the purification of water is presented wherein a saline solution is placed under pressure against a polymeric membrane supported by a microporous inert support. Salt and other impurities collect on one side of the membrane and purified water on the other. The membrane is made by a process wherein an allyl amine or similar compound is polymerized as a thin film in the presence of a plasma discharge. These films showed outstanding properties as reverse osmosis membranes. The membranes are formed essentially in the absence of air under conditions where few, if any, defects are produced. The most outstanding feature of the membranes is that they can be stored under ordinary ambient, dry conditions. NASA

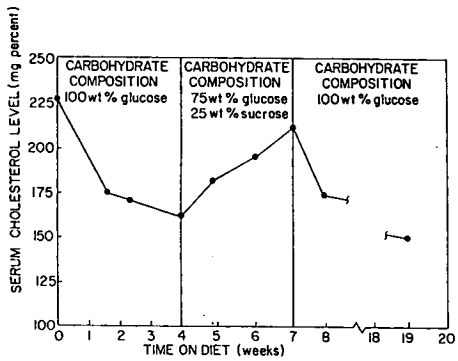


52 AEROSPACE MEDICINE

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

N75-15270* National Aeronautics and Space Administration. Pasadena Office, Calif.
REDUCTION OF BLOOD SERUM CHOLESTEROL Patent
Milton Winitz, inventor (to NASA) (Med. Sci. Res. Found.) Issued 19 Nov. 1974 6 p Filed 28 Jul. 1969 Continuation-in-part of abandoned US Patent Appl. SN-510778, filed 1 Dec. 1965
Sponsored by NASA
(NASA-Case-NPO-12119-1; US-Patent-3,849,554; US-Patent-Appl-SN-847815; US-Patent-Class-424-180) Avail: US Patent Office CSCL 06E

By feeding a human subject as the sole source of sustenance a defined diet wherein the carbohydrate consists substantially entirely of glucose, maltose or a polysaccharide of glucose, the blood serum cholesterol level of the human subject is substantially reduced. If 25 percent of the carbohydrate is subsequently supplied in the form of sucrose, an immediate increase from the reduced level is observed. The remainder of the defined diet normally includes a source of amino acids, such as protein or a protein hydrolysate, vitamins, minerals and a source of essential fatty acid.
Official Gazette of the U.S. Patent Office



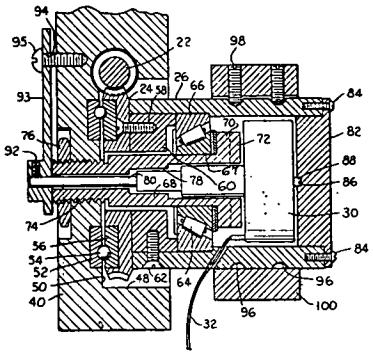
54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

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

N75-12616* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ORTHOTIC ARM JOINT Patent
Dan H. Dane, inventor (to NASA) Issued 19 Nov. 1974 7 p Filed 4 Oct. 1973 Supersedes N74-10100 (12 - 01, p 0013)
(NASA-Case-MFS-21611-1; US-Patent-3,849,668; US-Patent-Appl-SN-403694; US-Patent-Class-307-149; US-Patent-Class-214-1CM; US-Patent-Class-308-174) Avail: US Patent Office CSCL 05H

An improved orthopedic (orthotic) arm joint that can be used in various joint of mechanical arms is described. The arm joints includes a worm, which is coupled to an electric motor for rotating a worm gear carried within a rotatable housing. The worm gear is supported on a thrust bearing and the rotatable housing is supported on a radial thrust bearing. A bolt extends through the housing, bearings, and worm gear for securing the device together. A potentiometer extends through the bolt, and

is coupled to the rotatable housing for rotating therewith, so as to produce an electrical signal indicating the angular position of the rotatable housing. Official Gazette of the U.S. Patent Office



N75-13531* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

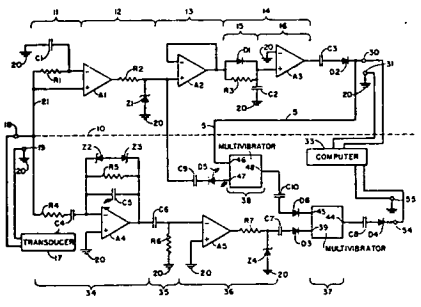
CIRCUIT FOR DETECTING INITIAL SYSTOLE AND DICROTIC NOTCH Patent

Vernon D. Gebben and John A. Webb, Jr., inventors (to NASA) Issued 26 Nov. 1974 7 p Filed 30 Jan. 1973 Supersedes N73-18139 (11 - 09, p 0997)

(NASA-Case-LEW-11581-1; US-Patent-3,850,169; US-Patent-Appl-SN-327921; US-Patent-Class-128-2.05P; US-Patent-Class-128-2.05A) Avail: US Patent Office CSCL 06B

Circuitry is disclosed for processing an arterial pressure waveform to produce during any one cycle a pulse corresponding to the initial systole and a pulse corresponding to the dicrotic notch. In a first channel, an electrical analog of the arterial pressure waveform is filtered and then compared to the original waveform to produce an initial systole signal. In a second channel, the analog is differentiated, filtered, and fed through a gate controlled by pulses from the first channel to produce an electrical pulse corresponding to the dicrotic notch.

Official Gazette of the U.S. Patent Office



N75-13534*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

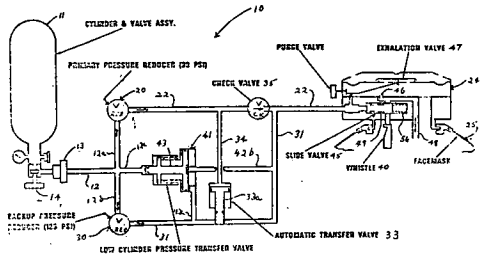
SELF-CONTAINED BREATHING APPARATUS Patent Application

John L. Sullivan (Scott Aviation Corp., Lancaster, N. Y.), Eugene A. Giorgini (Scott Aviation Corp., Lancaster, N. Y.), and Milo R. Simmonds, inventors (to NASA) (Scott Aviation Corp., Lancaster, N. Y.) Filed 11 Nov. 1974 12 p

(Contract NAS9-13177)

(NASA-Case-MSC-14733-1; NASA-Case-MSC-14735-1; US-Patent-Appl-SN-522971) Avail: NTIS HC $3.25 CSCL 06K

A self-contained breathing apparatus with automatic redundant fluid pressure controls is presented along with a self-contained breathing apparatus having a facemask respirator, automatic redundant fluid pressure controls, and a fluid-actuated alarm. The automatic redundant pressure controls provide alternate lines of fluid communication in the event of failure of the primary pressure reducer or depletion of the supply of gas to a low level. A fluid-actuated alarm, located in the facemask to avoid wasteful exhausting of the gas, signals either depletion of the supply of gas or a failure closed condition of the primary reducer. NASA



N75-13536*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

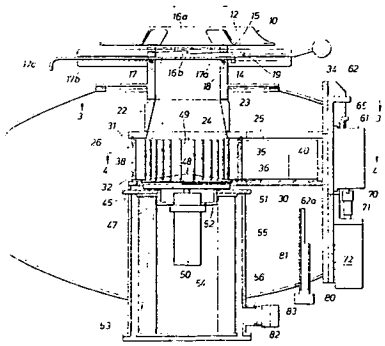
AUTOMATIC BIOWASTE SAMPLING Patent Application

G. L. Fogal (GE) and Richard L. Sauer, inventors (to NASA) Filed 22 Nov. 1974 18 p

(Contract NAS1-11443)

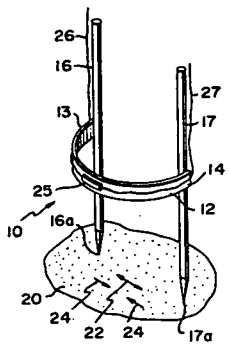
(NASA-Case-MSC-14640-1; US-Patent-Appl-SN-526449) Avail: NTIS HC $3.25 CSCL 14B

A sampling system for acquiring biowaste samples in a space craft is reported; the automatic biowaste system for sampling and disposal of feces and vomitus includes a storage container and an associated seat. The storage container has a slide valve which is releasably locked in positions placing the seat into and out of communication with the container. A passage from the seat leads to a rotating platform with peripherally located vertical tines. The rotating platform disperses waste radially. A retrievable, porous sampling strip is insertable about the periphery of the rotating platform and is retractable into a separate sampling container. The sampling strip is retrievable into a plastic storage container for subsequent analysis. NASA



N75-17102*# National Aeronautics and Space Administration. Pasadena Office, Calif.
MINIATURE MUSCLE DISPLACEMENT TRANSDUCER Patent Application
Cyril Feldstein (JPL), Jules V. Osher (JPL), Gilbert W. Lewis (JPL), Robert H. Silver (JPL), and Edward N. Duran, inventors (to NASA) (JPL) Filed 27 Dec. 1974 13 p
(Contract NAS7-100)
(NASA-Case-NPO-13519-1; US-Patent-Appl-SN-536761) Avail: NTIS HC $3.25 CSCL 06B

A miniature transducer, is described for use in sensing muscle displacement. Essentially this invention consists of a curved beam of high elastic compliance. The beam is connected at its ends to two prongs, which have sharpened tips insertable into a muscle. A very sensitive strain gauge is bonded to the beam at the point of greatest curvature. As the muscle contracts or expands, the spacing between the prongs changes, thereby changing the beam curvature which produces changes in the output signal across output lines of the strain gauge. NASA

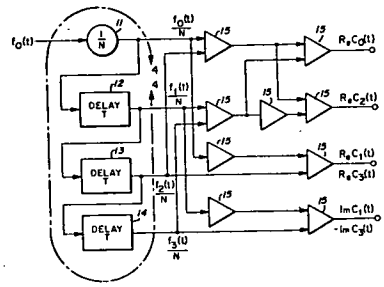


60 COMPUTER OPERATIONS AND HARDWARE

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

N75-13539* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
CONTINUOUS FOURIER TRANSFORM METHOD AND APPARATUS Patent
Robert M. Munoz, inventor (to NASA) Issued 26 Nov. 1974 12 p Filed 18 Apr. 1973 Supersedes N73-21199 (11 - 12, p 1381)
(NASA-Case-ARC-10466-1; US-Patent-3,851,162; US-Patent-Appl-SN-352382; US-Patent-Class-235-156; US-Patent-Class-235-197; US-Patent-Class-324-77B) Avail: US Patent Office CSCL 09B

An input analog signal to be frequency analyzed is separated into N number of simultaneous analog signal components each identical to the original but delayed relative to the original by a successively larger time delay. The separated and delayed analog components are combined together in a suitable number of adders and attenuators in accordance with at least one component product of the continuous Fourier transform and analog signal matrices to separate the analog input signal into at least one of its continuous analog frequency components of bandwidth 1/N times the bandwidth of the original input signal. The original analog input signal can be reconstituted by combining the separate analog frequency components in accordance with the component products of the continuous Fourier transform and analog frequency component matrices. The continuous Fourier transformation is useful for spectrum analysis, filtering, transfer function synthesis, and communications. Official Gazette of the U.S. Patent Office

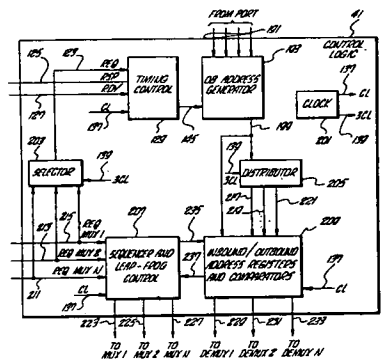


62 COMPUTER SYSTEMS

Includes computer networks.

N75-12652*# National Aeronautics and Space Administration. Pasadena Office, Calif.
MULTI-COMPUTER MULTIPLE DATA PATH HARDWARE EXCHANGE SYSTEM Patent Application
Tage O. Anderson, inventor (to NASA) Filed 6 Nov. 1974 41 p
(Contract NAS7-100)
(NASA-Case-NPO-13422-1; US-Patent-Appl-SN-521601) Avail: NTIS HC $3.75 CSCL 09B

Improvements made in mutiple data path switching exchanges for multi computer processing systems are reported. NASA

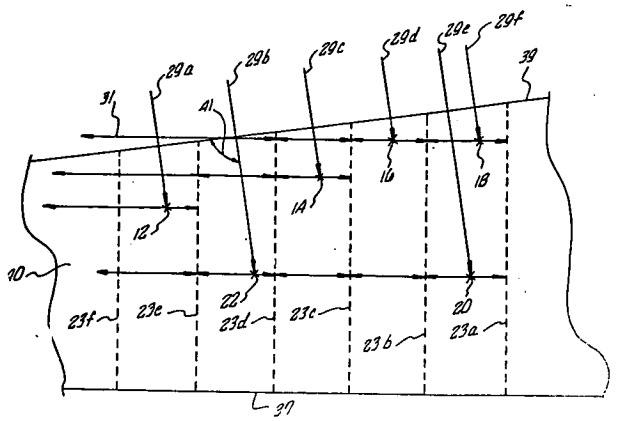


70 PHYSICS (GENERAL)

For geophysics see *46 Geophysics*. For astrophysics see *90 Astrophysics*. For solar physics see *92 Solar physics*.

N75-16307*# National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD AND APPARATUS FOR GENERATING COHERENT RADIATION IN THE ULTRAVIOLET REGION AND ABOVE BY USE OF DISTRIBUTED FEEDBACK Patent Application
Melvin M. Saffren, inventor (to NASA) (JPL) Filed 17 Dec. 1974 19 p
(Contract NAS7-100)
(NASA-Case-NPO-13346-1; US-Patent-Appl-SN-533556) Avail: NTIS HC $3.25 CSCL 20N

Helium in the superfluid state was found to emit copious amounts of radiation in the ultraviolet region when excited by an electron stream. Conventional laser action using mirrors is impossible in superfluid helium because there are no mirrors that will reflect VUV radiation. By utilizing the method of distributed feedback, the superfluid helium can be made to lase. The photons leave the superfluid helium at right angles to the information coupled with associated bearing information was then used to provide continuous target fixes. Author (GRA)



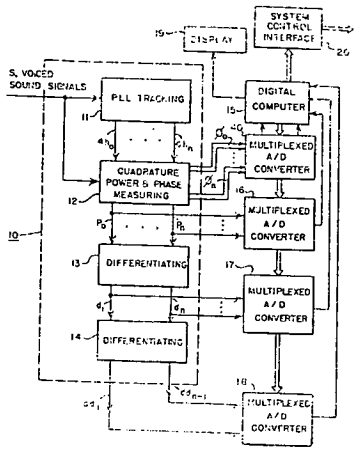
71 ACOUSTICS

Includes sound generation, transmission and attenuation.

For noise pollution see *45 Environment Pollution*.

N75-13593*# National Aeronautics and Space Administration. Pasadena Office, Calif.
REAL TIME ANALYSIS OF VOICED SOUNDS Patent Application
Jung P. Hong, inventor (to NASA) (JPL) Filed 11 Dec. 1974 20 p
(Contract NAS7-100)
(NASA-Case-NPO-13465-1; US-Patent-Appl-SN-531575) Avail: NTIS HC $3.25 CSCL 20A

A power spectrum analysis of the harmonic content of a voiced sound signal is conducted in real time by phase-lock-loop tracking of the fundamental frequency of the signal and successive harmonics hl through hn of the fundamental frequency. The quadrature power and phase of each frequency tracked is measured, differentiating the power measurements of the harmonics in adjacent pairs and analyzing successive differentials. The differentials are used to determine peak power points in the power spectrum for display or use in analysis of voiced sound, such as for voice recognition. NASA

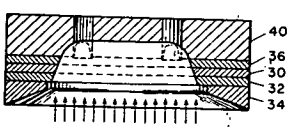


74 OPTICS

Includes light phenomena.

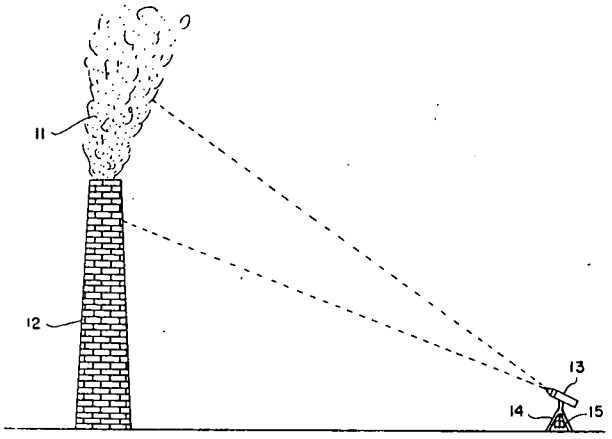
N75-12732* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
METHOD OF FORMING APERTURE PLATE FOR ELECTRON MICROSCOPE Patent
Klaus Heinemann, inventor (to NASA) (NAS-NRC) Issued 12 Nov. 1974 6 p Filed 28 Jun. 1973 Supersedes N74-12190 (12 - 03, p 0293) Continuation-in-part of abandoned US Patent Appl. SN-221670, filed 28 Jan. 1972 Sponsored by NASA
(NASA-Case-ARC-10448-2; US-Patent-3,847,689; US-Patent-Appl-SN-374424; US-Patent-Class-156-7; US-Patent-Class-156-16; US-Patent-Class-156-18; US-Patent-Class-250-495) Avail: US Patent Office CSCL 20F

An electron microscope is described with an electron source a condenser lens having either a circular aperture for focusing a solid cone of electrons onto a specimen or an annular aperture for focusing a hollow cone of electrons onto the specimen. It also has objective lens with an annular objective aperture, for focusing electrons passing through the specimen onto an image plane. A method of making the annular objective aperture using electron imaging, electrolytic deposition and ion etching techniques is included. Official Gazette of the U.S. Patent Office



N75-20091*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
STACK PLUME VISUALIZATION SYSTEM Patent Application
Reginald J. Exton, inventor (to NASA) Filed 11 Mar. 1975 11 p
(NASA-Case-LAR-11675-1; US-Patent-Appl-SN-557448) Avail: NTIS HC $3.25 CSCL 20F

A method and apparatus for measuring, at a remote location, the concentration and velocity of SO2 in plume from a smokestack is disclosed. An ultraviolet video system views the plume against the background sky at wavelengths where SO2 molecules absorb light. The result is a real time display of the plume coupled with means for measuring the SO2 concentration at any point in the plume and at any time desired. In addition, means are provided in combination with the ultraviolet video system for measuring the velocity of the SO2 in the plume. NASA



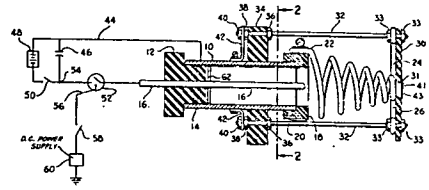
75 PLASMA PHYSICS

Includes magnetohydrodynamics and plasma fusion.

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

N75-13625* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SELF-ENERGIZED PLASMA COMPRESSOR Patent
Edward L. Shriver (NAS-NRC) and Eduard B. Igenbergs, inventors (to NASA) (NAS-NRC) Issued 10 Dec. 1974 4 p Filed 6 Jun. 1973 Supersedes N73-26721 (11 - 17, p 2067) Sponsored by NASA
(NASA-Case-MFS-22145-1; US-Patent-3,854,097; US-Patent-Appl-SN-367606; US-Patent-Class-328-233; US-Patent-Class-176-3; US-Patent-Class-313-63; US-Patent-Class-315-111) Avail: NTIS Avail: US Patent Office CSCL 29I

The self-energized plasma compressor is described which compresses plasma discharged from a coaxial plasma generator. The device includes a helically shaped coil which is coaxially aligned with the center axis of the coaxial plasma generator. The plasma generator creates a current through the helical coil which, in turn, generates a time varying magnetic field that creates a force which acts radially upon the plasma. The coaxial plasma generator and helical coil move the plasma under high pressure and temperature to the narrow end of the coil. Positioned adjacent to the narrow end of the coil are beads which are engaged by the plasma to be accelerated to hypervelocities for simulating meteoroids. Official Gazette of the U.S. Patent Office



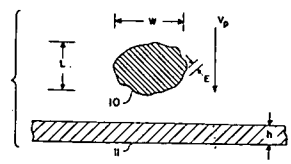
76 SOLID-STATE PHYSICS

Includes superconductivity.

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

N75-12810* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
DETERMINING PARTICLE DENSITY USING KNOWN MATERIAL HUGENIOT CURVES Patent
John D. DiBattista, inventor (to NASA) Issued 22 Oct. 1974 18 p Filed 5 Jun. 1973 Supersedes N73-26838 (11 - 17, p 2082)
(NASA-Case-LAR-11059-1; US-Patent-3,842,656; US-Patent-Appl-SN-367294; US-Patent-Class-73-32R; US-Patent-Class-73-432PS) Avail: US Patent Office CSCL 20H

A method is detailed to determine the density of particles wherein the closing velocity is known between the impacting particles and a plate of known material. Either the shock wave velocity or the material velocity produced in the plate upon impact by an unknown material particle is determined and compared with the corresponding shock wave or material velocity that would by produced by different known material particles having the same closing velocity upon impact with the plate. The unknown material particle density is derived by obtaining a coincidence of the shock wave velocity or material velocity conditions initially produced upon impact between the known material plate and one of the different material particles and from the fact that shock wave velocity and material velocity are ordered on the impacting particle material density alone.
Official Gazette of the U.S. Patent Office



77 THERMODYNAMICS AND STATISTICAL PHYSICS

Includes quantum mechanics; and Bose and Fermi statistics.

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

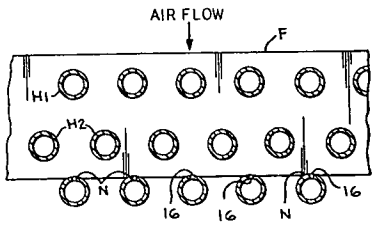
N75-20139* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

CONDENSATE REMOVAL DEVICE FOR HEAT EXCHANGER Patent

Raymond B. Trusch (Hamilton Std. Div., United Aircraft Corp., Windsor Locks, Conn.) and Edward W. OConnor, inventors (to NASA) (Hamilton Std. Div., United Aircraft Corp., Windsor Locks, Conn.) Issued 4 Mar. 1975 9 p Filed 31 Aug. 1973 Supersedes N73-32823 11 - 23, p 2856 Sponsored by NASA

(NASA-Case-MSC-14143-1; US-Patent-3,868,830; US-Patent-Appl-SN-393526; US-Patent-Class-62-290; US-Patent-Class-62-93; US-Patent-Class-62-285; US-Patent-Class-62-288; US-Patent-Class-62-289; US-Patent-Class-62-317; US-Patent-Class-165-110; US-Patent-Class-165-111) Avail: US Patent Office CSCL 20M

A set of perforated tubes disposed at the gas output side of a heat exchanger, in a position not to affect the rate of flow of the air or other gas is described. The tubes are connected to a common manifold which is connected to a sucking device. Where it is necessary to conserve and recirculate the air sucked through the tubes, the output of the manifold is run through a separator to remove the condensate from the gas. The perforations in the slurper tubes are small, lying in the range of 0.010 inch to 0.100 inch. The tubes are disposed in contact with the surfaces of the heat exchanger on which the condensate is precipitated, whether fins or plates, so that the water may be directed to the tube openings by means of surface effects, together with the assistance of the air flow. Only about 5 percent of the air output need be thus diverted, and it effectively removes virtually all of the condensate. Official Gazette of the U.S. Patent Office



N75-20140* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

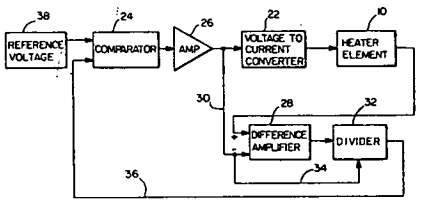
SELF-REGULATING PROPORTIONALLY CONTROLLED HEATING APPARATUS AND TECHNIQUE Patent

Maxwell G. Strange, inventor (to NASA) Issued 4 Mar. 1975 6 p Filed 27 Feb. 1974 Supersedes N74-19583 (12 - 10, p 1233)

(NASA-Case-GSC-11752-1; US-Patent-3,869,597; US-Patent-Appl-SN-446569; US-Patent-Class-219-505; US-Patent-Class-219-497; US-Patent-Class-219-501) Avail: US Patent Office CSCL 20M

A self-regulating proportionally controlled heating apparatus and technique is provided wherein a single electrical resistance heating element having a temperature coefficient of resistance serves simultaneously as a heater and temperature sensor. The heating element is current-driven and the voltage drop across the heating element is monitored and a component extracted which is attributable to a change in actual temperature of the heating element from a desired reference temperature, so as to produce a resulting error signal. The error signal is utilized to control the level of the heater drive current and the actual heater temperature in a direction to reduce the noted temperature difference. The continuous nature of the process for deriving the error signal feedback information results in true proportional control of the heating element without the necessity for current-switching which may interfere with nearby sensitive circuits, and with no cyclical variation in the controlled temperature.

Official Gazette of the U.S. Patent Office



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15. Supplementary Notes

Section 1 - Abstracts

16. Abstract

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