NASA SP-7039(22)
Section 1
Abstracts

NASA

PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

Annotated references to NASA-owned inventions covered by U.S. patents and applications for patent that were announced in *Scientific and Technical Aerospace Reports (STAR)* between July 1982 and December 1982.

NASA Scientific and Technical Information Branch 1983
National Aeronautics and Space Administration
Washington, DC

This supplement is available as NTISUB/111/093 from the National Technical Information Service (NTIS), Springfield, Virginia 22161 at the price of $10.00 domestic; $20.00 foreign for standing orders. Please note: Standing orders are subscriptions which do not terminate at the end of a year, as do regular subscriptions, but continue indefinitely unless specifically terminated by the subscriber.

INTRODUCTION

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

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

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

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

The 234 citations published in this issue of the Abstract Section cover the period July 1982 through December 1982. The Index Section references over 4000 citations covering the period May 1969 through December 1982.

ABSTRACT SECTION (SECTION 1)

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

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

NASA Accession Number
NASA Case Number
Inventor's Name
Title of Invention
U.S. Patent Application Serial Number
U.S. Patent Number (for issued patents only)
U.S. Patent Office Classification Number(s)
(for issued patents only)

These data elements in the citation of the abstract are depicted in the Typical Citation and Abstract reproduced on the following page and are also used in the indexes.

TYPICAL CITATION AND ABSTRACT

NASA SPONSORED DOCUMENT

AVAILABLE ON MICROFICHE

NASA ACCESSION NUMBER

SOURCE

TITLE

INVENTOR

US PATENT APPLICATIONS SERIAL NUMBER

NASA CASE NUMBER

AVAILABILITY

ABSTRACT

COSATI CODE

N82-16203*# National Aeronautics and Space Administration Langley Research Center, Hampton, Va.

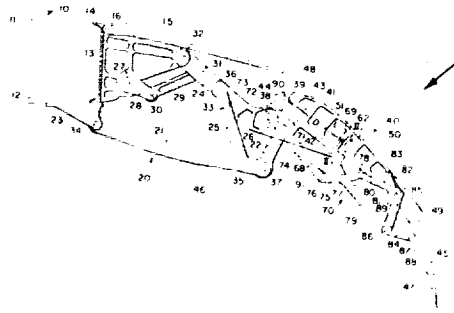
SLOTTED VARIABLE CAMBER FLAP Patent Application

Dana G. Andrews, inventor (to NASA) (Boeing Commercial Airplane Co., Seattle) Filed 30 Oct. 1981 13 p Sponsored by NASA

(NASA-Case-LAR-12541-1; US-Patent-Appl-SN-315588) Avail: NTIS HC A02/MF A01 CSCL 01C

Variable camber actuator assemblies broaden the range of speeds at which lift to drag performance is maximized for slotted flap wings. Lift is improved by varying wing camber with rotational flap movements that do not introduce wing slots and induced drag. Forward flaps are secured to forward flange links which extend from, and are a part of, forward flap linkage assemblies. The forward flaps rotate about flap pivots with their rotational displacement controlled by variable camber actuator assemblies located between the forward flaps and the forward flange links. Rear flaps are held relative to the forward flaps by rear flap linkage assemblies which may act independently from the forward flap linkage assemblies and the variable camber actuator assemblies. Wing camber is varied by rotating the flaps with the variable camber actuator assemblies while the flaps are in a deployed or tucked position. Rotating flaps in a tucked position does not introduce significant wing surface discontinuities, and reduces aircraft fuel consumption on most flight profiles. NASA

KEY ILLUSTRATION



INDEX SECTION (SECTION 2)

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

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

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

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

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

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

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

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

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

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

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

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

PUBLIC AVAILABILITY OF COPIES OF PATENTS AND PATENT APPLICATIONS

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

NASA *patent application specifications* are sold in paper copy by the National Technical Information Service at price code A02 ($7.00 domestic; $14.00 foreign). Microfiche are sold at price code A01 ($4.50 domestic; $9.00 foreign). The US-Patent-Appl-SN-number should be used in ordering either paper copy or microfiche from NTIS.

LICENSES FOR COMMERCIAL USE: INQUIRIES AND APPLICATIONS FOR LICENSE

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

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

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

NASA Case Number Prefix Letters	Address of Cognizant NASA Patent Counsel
ARC-xxxxx XAR-xxxxx	Ames Research Center Mail Code: 200-11A Moffett Field, California 94035 Telephone: (415)965-5104
ERC-xxxxx XER-xxxxx HQN-xxxxx XHQ-xxxxx	NASA Headquarters Mail Code: GP-4 Washington, D.C. 20546 Telephone: (202)755-3954
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301)344-7351
KSC-xxxxx XKS-xxxxx	John F. Kennedy Space Center Mail Code: PT-PAT Kennedy Space Center, Florida 32899 Telephone: (305)867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code: 279 Hampton, Virginia 23365 Telephone: (804)827-8725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code: 500-318 21000 Brookpark Road Cleveland, Ohio 44135 Telephone: (216)433-6346
MSC-xxxxx XMS-xxxxx	Lyndon B. Johnson Space Center Mail Code: AL3 Houston, Texas 77058 Telephone: (713)483-4871
MFS-xxxxx XMF-xxxxx	George C. Marshall Space Flight Center Mail Code: CC01 Huntsville, Alabama 35812 Telephone: (205)453-0020
NPO-xxxxx XNP-xxxxx FRC-xxxxx XFR-xxxxx WOO-xxxxx	NASA Resident Legal Office Mail Code: 180-801 4800 Oak Grove Drive Pasadena, California 91103 Telephone: (213)354-2700

PATENT LICENSING REGULATIONS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

14 CFR Part 1245

Licensing of NASA Inventions

AGENCY: National Aeronautics and Space Administration.

ACTION: Interim regulation with comments requested.

SUMMARY: The National Aeronautics and Space Administration (NASA) is revising its patent licensing regulations to conform with Pub. L. 96-517. This interim regulation provides policies and procedures applicable to the licensing of federally owned inventions in the custody of the National Aeronautics and Space Administration, and implements Pub. L. 96-517. The object of this subpart is to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

EFFECTIVE DATE: July 1, 1981. Comments must be received in writing by December 2, 1981. Unless a notice is published in the **Federal Register** after the comment period indicating changes to be made, this interim regulation shall become a final regulation.

ADDRESS: Mr. John G. Mannix, Director of Patent Licensing, GP-4, NASA, Washington, D.C. 20546.

FOR FURTHER INFORMATION CONTACT: Mr. John G. Mannix, (202) 755-3954.

SUPPLEMENTARY INFORMATION:

PART 1245—PATENTS AND OTHER INTELLECTUAL PROPERTY RIGHTS

Subpart 2 of Part 1245 is revised to read as follows:

* * * * *

Subpart 2—Licensing of NASA Inventions

Sec.

Authority: 35 U.S.C. Section 207 and 208, 94 Stat. 3023 and 3024.

* * * * *

Subpart 2—Licensing of NASA Inventions

§ 1245.200 Scope of subpart.

This subpart prescribes the terms, conditions, and procedures upon which a NASA invention may be licensed. It does not affect licenses which (a) were in effect prior to July 1, 1981; (b) may exist at the time of the Government's acquisition of title to the invention, including those resulting from the allocation of rights to inventions made under Government research and development contracts; (c) are the result of an authorized exchange of rights in the settlement of patent disputes; or (d) are otherwise authorized by law or treaty.

§ 1245.201 Policy and objective.

It is the policy and objective of this subpart to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

§ 1245.202 Definitions.

(a) "Federally owned invention" means an invention, plant, or design which is covered by a patent, or patent application in the United States, or a patent, patent application, plant variety protection, or other form of protection, in a foreign country, title to which has been assigned to or otherwise vested in the United States Government.

(b) "Federal agency" means an executive department, military department, Government corporation, or independent establishment, except the Tennessee Valley Authority, which has custody of a Federally owned invention.

(c) "NASA Invention" means a Federally owned invention with respect to which NASA maintains custody and administration, in whole or in part, of the right, title, or interest in such invention on behalf of the United States Government.

(d) "Small business firm" means a small business concern as defined at section 2 of Pub. L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of these regulations, the size standard for small business concerns involved in Government procurement, contained in 13 CFR 121.3-8, and in subcontracting, contained in 13 CFR 121.3-12, will be used.

(e) "Practical application" means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

(f) "United States" means the United States of America, its territories and possessions, the District of Columbia, and the Commonwealth of Puerto Rico.

§ 1245.203 Authority to grant licenses.

NASA inventions shall be made available for licensing as deemed appropriate in the public interest. NASA may grant nonexclusive, partially exclusive, or exclusive licenses thereto under this subpart on inventions in its custody.

Restrictions and Conditions

§ 1245.204 All licenses granted under this subpart.

(a) *Restrictions.* (1) A license may be granted only if the applicant has supplied NASA with a satisfactory plan for development or marketing of the invention, or both, and with information about the applicant's capability to fulfill the plan.

(2) A license granting rights to use or sell under a NASA invention in the United States shall normally be granted only to a licensee who agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

(b) *Conditions.* Licenses shall contain such terms and conditions as NASA determines are appropriate for the protection of the interests of the Federal Government and the public and are not in conflict with law or this subpart. The following terms and conditions apply to any license:

(1) The duration of the license shall be for a period specified in the license agreement, unless sooner terminated in accordance with this subpart.

(2) The license may be granted for all or less than all fields of use of the invention or in specified geographical areas, or both.

(3) The license may extend to subsidiaries of the licensee or other parties if provided for in the license but shall be nonassignable without approval of NASA, except to the successor of that part of the licensee's business to which the invention pertains.

(4) The license may provide the licensee the right to grant sublicenses under the license, subject to the approval of NASA. Each sublicense shall make reference to the license, including the rights retained by the Government, and a copy of such

sublicense shall be furnished to NASA.

(5) The license shall require the licensee to carry out the plan for development or marketing of the invention, or both, to bring the invention to practical application within a period specified in the license, and to continue to make the benefits of the invention reasonably accessible to the public.

(6) The license shall require the licensee to report periodically on the utilization or efforts at obtaining utilization that are being made by the licensee, with particular reference to the plan submitted.

(7) All licenses shall normally require royalties or other consideration.

(8) Where an agreement is obtained pursuant to § 1245.204(a)(2) that any products embodying the invention or produced through use of the invention will be manufactured substantially in the United States, the license shall recite such agreement.

(9) The license shall provide for the right of NASA to terminate the license, in whole or in part, if:

(i) NASA determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of NASA that it has taken or can be expected to take within a reasonable time effective steps to achieve practical application of the invention;

(ii) NASA determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee;

(iii) The licensee has willfully made a false statement of or willfully omitted a material fact in the license application or in any report required by the license agreement; or

(iv) The licensee commits a substantial breach of a covenant or agreement contained in the license.

(10) The license may be modified or terminated, consistent with this subpart, upon mutual agreement of NASA and the licensee.

(11) Nothing relating to the grant of a license, nor the grant itself, shall be construed to confer upon any person any immunity from or defenses under the antitrust laws or from a charge of patent misuse, and the acquisition and use of rights pursuant to this subpart shall not be immunized from the operation of state or Federal law by reason of the source of the grant.

Types of Licenses

§ 1245.205 Nonexclusive licenses.

(a) *Availability of licenses.* Nonexclusive licenses may be granted under NASA inventions without publication of availability or notice of a prospective license.

(b) *Conditions.* In addition to the provisions of § 1245.204, the nonexclusive license may also provide that, after termination of a period specified in the license agreement, NASA may restrict the license to the fields of use or geographic areas, or both, in which the licensee has brought the invention to practical application and continues to make the benefits of the invention reasonably accessible to the public. However, such restriction shall be made only in order to grant an exclusive or partially exclusive license in accordance with this subpart.

§ 1245.206 Exclusive and partially exclusive licenses.

(a) Domestic licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on NASA inventions: (i) 3 months after notice of the invention's availability has been announced in the **Federal Register**; or (ii) without such notice where NASA determines that expeditious granting of such a license will best serve the interests of the Federal Government and the public; and (iii) in either situation, specified in (a)(1)(i) or (ii) of this section only if:

(A) Notice of a prospective license, identifying the invention and the prospective licensee, has been published in the **Federal Register**, providing opportunity for filing written objections within a 60-day period;

(B) After expiration of the period in § 1245.206(a) (1)(iii)(A) and consideration of nay written objections received during the period, NASA has determined that:

(*1*) The interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

(*2*) The desired practial application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention;

(*3*) Exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

(*4*) The proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public;

(C) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws; and

(D) NASA has given first preference to any small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and as equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

(2) *Conditions.* In addition to the provisions of § 1245.204, the following terms and conditions apply to domestic exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall reserve to NASA the right to require the licensee to grant sublicenses to responsible applicants, on reasonable terms, when necessary to fulfill health or safety needs.

(iii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iv) The license may grant the licensee the right of enforcement of the licensed patent pursuant to the provisions of Chapter 29 of Title 35, United States Code, or other statutes, as determined appropriate in the public interest.

(b) Foreign licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on a NASA invention covered by a foreign patent, patent application, or other form of protection, provided that:

(i) Notice of a prospective license, identifying the invention and prospective licensee, has been published in the **Federal Register**, providing opportunity for filing written objections

within a 60-day period and following consideration of such objections;

(ii) NASA has considered whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced; and

(iii) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

(2) *Conditions.* In addition to the provisions of § 1245.204, the following terms and conditions apply to foreign exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iii) The license may grant the licensee the right to take any suitable and necessary actions to protect the licensed property, on behalf of the Federal Government.

(c) *Record of determinations.* NASA shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Procedures

§ 1245.207 Application for a license.

An application for a license should be addressed to the Patent Counsel at the NASA installation having responsibility for the invention and shall normally include:

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

(b) Identification of the type of license for which the application is submitted;

(c) Name and address of the person, company, or organization applying for the license and the citizenship or place of incorporation of the applicant;

(J) Name, address, and telephone number of representative of applicant to whom correspondence should be sent;

(e) Nature and type of applicant's business, identifying products or services which the applicant has successfully commercialized, and approximate number of applicant's employees;

(f) Source of information concerning the availability of a license on the invention;

(g) A statement indicating whether applicant is a small business firm as defined in § 1245.202(c);

(h) A detailed description of applicant's plan for development or marketing of the invention, or both, which should include:

(1) A statement of the time, nature and amount of anticipated investment of capital and other resources which applicant believes will be required to bring the invention to practical application;

(2) A statement as to applicant's capability and intention to fulfill the plan, including information regarding manufacturing, marketing, financial, and technical resources;

(3) A statement of the fields of use for which applicant intends to practice the invention; and

(4) A statement of the geographic areas in which applicant intends to manufacture any products embodying the invention and geographic areas where applicant intends to use or sell the invention, or both;

(i) Identification of licenses previously granted to applicant under Federally owned inventions;

(j) A statement containing applicant's best knowledge of the extent to which the invention is being practiced by private industry or Government, or both, or is otherwise available commercially; and

(k) Any other information which applicant believes will support a determination to grant the license to applicant.

§ 1245.208 Processing applications.

(a) Applications for licenses will be initially reviewed by the Patent Counsel of the NASA installation having responsibility for the invention. The Patent Counsel shall make a preliminary recommendation to the Director of Licensing, NASA Headquarters, whether to: (1) grant the license as requested, (2) grant the license with modification after negotiation with the licensee, or (3) deny the license. The Director of Licensing shall review the preliminary recommendation of the Patent Counsel and make a final recommendation to the NASA Assistant General Counsel for Patent Matters. Such review and final recommendation may include, and be based on, any additional information obtained from applicant and other sources that the Patent Counsel and the Director of Licensing deem relevant to the license requested. The determination to grant or deny the license shall be made by the Assistant General Counsel for Patent Matters based on the final recommendation of the Director of Licensing.

(b) When notice of a prospective exclusive or partially exclusive license is published in the Federal Register in accordance with § 1245.206(a)(1)(iii)(A) or § 1245.206(b)(1)(i), any written objections received in response thereto will be considered by the Director of Licensing in making the final recommendation to the Assistant General Counsel for Patent Matters.

(c) If the requested license, including any negotiated modifications, is denied by the Assistant General Counsel for Patent Matters, the applicant may request reconsideration by filing a written request for reconsideration within 30 days after receiving notice of denial. This 30-day period may be extended for good cause.

(d) In addition to, or in lieu of requesting reconsideration, the applicant may also appeal the denial of the license in accordance with § 1245.211.

§ 1245.209 Notice to Attorney General.

A copy of the notice provided for in §§ 1245.206(a)(1)(iii)(A), and 1245.206(b)(1)(i) will be sent to the Attorney General.

§ 1245.210 Modification and termination of licenses.

Before modifying or terminating a license, other than by mutual agreement, NASA shall furnish the licensee and any sublicensee of record a written notice of intention to modify or terminate the license, and the licensee and any sublicensee shall be allowed 30 days after such notice to remedy any breach of the license or show cause why the license should not be modified or terminated.

§ 1245.211 Appeals.

(a) The following parties may appeal to the NASA Administrator or designee any decision or determination concerning the grant, denial, interpretation, modification, or termination of a license:

(1) A person whose application for a license has been denied;

(2) A licensee whose license has been modified or terminated, in whole or in part; or

(3) A person who timely filed a written objection in response to the notice required by §§ 1245.206(a)(1)(iii)(A) or

1245.206(b)(1)(i) and who can demonstrate to the satisfaction of NASA that such person may be damaged by the Agency action.

(b) Written notice of appeal must be filed within 30 days (or such other time as may be authorized for good cause shown) after receiving notice of the adverse decision or determination; including, an adverse decision following the request for reconsideration under § 1245.208(c). The notice of appeal, along with all supporting documentation should be addressed to the Administrator, National Aeronautics and Space Administration, Washington. DC 20546. Should the appeal raise a genuine dispute over material facts, fact-finding will be conducted by the NASA Inventions and Contributions Board. The person filing the appeal shall be afforded an opportunity to be heard and to offer evidence in support of the appeal. The Chairperson of the Inventions and Contributions Board shall prepare written findings of fact and transmit them to the Administrator or designee. The decision on the appeal shall be made by the NASA Administrator or designee. There is no further right of administrative appeal from the decision of the Administrator or designee.

§ 1245.212 Protection and administration of inventions.

NASA may take any suitable and necessary steps to protect and administer rights to NASA inventions, either directly or through contract.

§ 1245.213 Transfer of custody.

NASA having custody of certain Federally owned inventions may transfer custody and administration in whole or in part, to another Federal agency, of the right, title, or interest in any such invention.

§ 1245.214 Confidentiality of information.

Title 35, United States Code, section 209, provides that any plan submitted pursuant to § 1245.207(h) and any report required by § 1245.204(b)(6) may be treated by NASA as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of Title 5 of the United States Code.

James M. Beggs,

Administrator.

October 15, 1981.

[FR Doc. 81-31609 Filed 10-30-81; 8:45 am]

BILLING CODE 7516-01-M

FOREIGN PATENT LICENSING REGULATIONS

Selected NASA inventions are also available for licensing in countries other than the United States in accordance with the NASA Foreign Patent Licensing Regulation (14 C.F.R. 1245.4), a copy of which is available from any NASA Patent Counsel. For abstracts of NASA-owned inventions available for licensing in countries other than the United States, see NASA SP-7038, "Significant NASA Inventions Available for Licensing in Countries Other Than the United States." A copy of this NASA publication is available from NASA Headquarters, Code GP-4, Washington, D.C., 20546

TABLE OF CONTENTS

Section 1 • Abstracts

AERONAUTICS

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

For related information see also *Astronautics*.

ASTRONAUTICS

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

For related information see also *Aeronautics*

CHEMISTRY AND MATERIALS

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

ENGINEERING

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

GEOSCIENCES

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

LIFE SCIENCES

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

MATHEMATICAL AND COMPUTER SCIENCES

Includes mathematical and computer sciences (general); computer operations and hardware; computer programming and software; computer systems; cybernetics; numerical analysis; statistics and probability; systems analysis; and theoretical mathematics.

PHYSICS

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

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.

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

Section 2 • Indexes

JANUARY 1983 (Supplement 22)

NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION

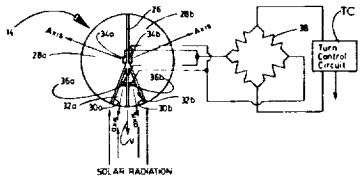
Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

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

N82-23231* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
SUN SENSING GUIDANCE SYSTEM FOR HIGH ALTITUDE AIRCRAFT Patent
Robert D. Reed, Principal Investigator Issued 27 Apr. 1982 7 p Filed 12 Mar. 1980 Supersedes N80-20249 (18 - 11, p 1375)
(NASA-Case-FRC-11052-1; US-Patent-4,326,685; US-Patent-Appl-SN-129783; US-Patent-Class-244-175; US-Patent-Class-244-168; US-Patent-Class-244-190; US-Patent-Class-318-580) Avail: US Patent and Trademark Office CSCL 17G

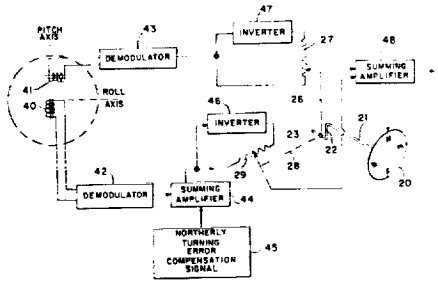
A sun sensing guidance system for high altitude aircraft is described. The system is characterized by a disk shaped body mounted for rotation aboard the aircraft in exposed relation to solar radiation. The system also has a plurality of mutually isolated chambers; each chamber being characterized by an opening having a photosensor disposed therein and arranged in facing relation with the opening for receiving incident solar radiation and responsively providing a voltage output. Photosensors are connected in paired relation through a bridge circuit for providing heading error signals in response to detected imbalances in intensities of solar radiation.

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



N82-26260*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MAGNETIC HEADING REFERENCE Patent Application
H. Douglas Garner, inventor (to NASA) Filed 9 Apr. 1982 19 p
(NASA-Case-LAR-12638-1; US-Patent-Appl-SN-367,187) Avail: NTIS HC A02/MF A01 CSCL 17G

The invention relates to devices which vectorially sum the output signals from two magnetometers on an aircraft to produce a signal which is indicative of the error in the heading of the aircraft. This error in heading signal is used either by the pilot or an automatic control system to correct the heading. The device for generating a signal indicative of the difference between the actual heading and the selected heading of a vehicle is described. T.M.



05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE

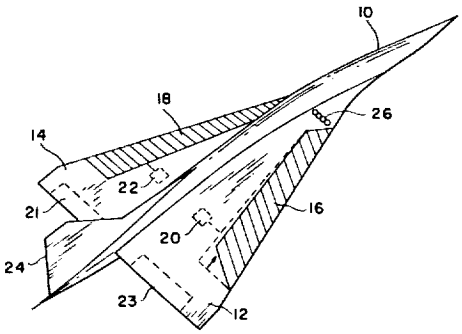
Includes aircraft simulation technology.

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

N82-25240*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LEADING EDGE FLAP SYSTEM FOR AIRCRAFT CONTROL AUGMENTATION Patent Application
Dhanvada M. Rao, inventor (to NASA) (Old Dominion Univ.) Filed 10 Sep. 1981 15 p Sponsored by NASA
(NASA-Case-LAR-12787-1; US-Patent-Appl-SN-301078) Avail: NTIS HC A02/MF A01 CSCL 01C

Traditional roll control systems such as ailerons, elevons or spoilers are least effective at high angles of attack due to boundary layer separation over the wing. Independently deployed leading edge flaps on the upper surfaces of vortex stabilized wings are used to shift the center of lift outboard. A rolling moment is created that is used to control roll in flight at high angles of attack. The effectiveness of the rolling moment increases linearly with angle of attack. No adverse yaw effects are induced.

In an alternate mode of operation, both leading edge flaps are deployed together at cruise speeds to create a very effective airbrake without appreciable modification in pitching moment. Little trim change is required. NASA



N82-26277* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

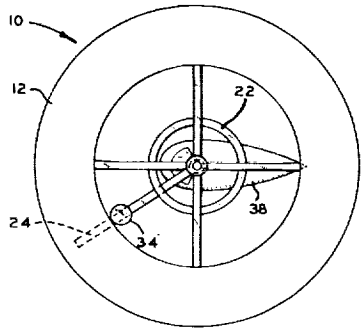
ANNULAR WING Patent

Harold J. Walker, inventor (to NASA) Issued 29 Dec. 1981 12 p Filed 30 May 1979 Supersedes N79-24959 (17 - 16, p 2070) Continuation of abandoned US Patent Appl. SN-880725, filed 24 Feb 1978

(NASA-Case-FRC-11007-2; US-Patent-4,307,856; US-Patent-Appl-SN-043911; US-Patent-Class-244.12.2; US-Patent-Class-244-23C; US-Patent-Class-244-34A; US-Patent-Class-244-93) Avail: US Patent and Trademark Office CSCL 01C

An annular wing particularly suited for use in supporting in flight an aircraft characterized by the absence of directional stabilizing surfaces is described. The wing comprises a rigid annular body of a substantially uniformly symmetrical configuration characterized by an annular positive lifting surface and cord line coincident with the segment of a line radiating along the surface of an inverted truncated cone. A decalage is established for the leading and trailing semicircular portions of the body, relative to instantaneous line of flight, and a dihedral for the laterally opposed semicircular portions of the body, relative to the line of flight. The direction of flight and climb angle or glide slope angle are established by selectively positioning the center of gravity of the wing ahead of the aerodynamic center along the radius coincident with an axis for a selected line of flight.

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



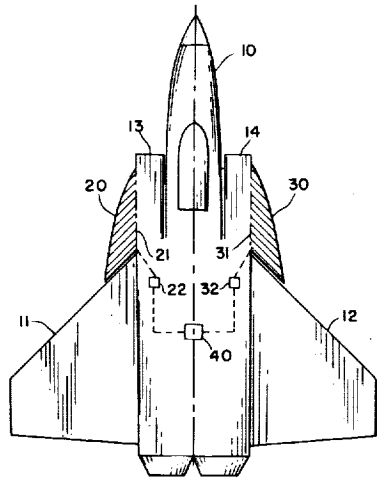
N82-26278*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

HINGED STRAKE AIRCRAFT CONTROL SYSTEM Patent Application

Dhanvada M. Rao, inventor (to NASA) (Vigyan Research Associates, Inc.) Filed 11 Jan. 1982 13 p Sponsored by NASA

(NASA-Case-LAR-12860-1; US-Patent-Appl-SN-338387) Avail: NTIS HC A02/MF A01 CSCL 01C

Strakes hinged along the fuselage to avoid violent control degradation in the post-stall flight regime are described. Hinged strakes are deflected from the conventional position coplanar with wings to an anhedral setting to increase controllability at high angles of attack by decreasing projected plan area, and altering vortex flow characteristics. As a result, effective lift on wings can be maintained at higher angles of attack than is possible with conventional strakes. The hinged strakes are retracted flush against the fuselage in high speed cruise flight to avoid drag effects. In an alternate mode of operation, strakes can be asymmetrically deployed to create a rolling that enhances roll control, and a side force that counters aircraft nose-slice and directional divergence. NASA



N82-28279* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

MEANS FOR CONTROLLING AERODYNAMICALLY INDUCED TWIST Patent

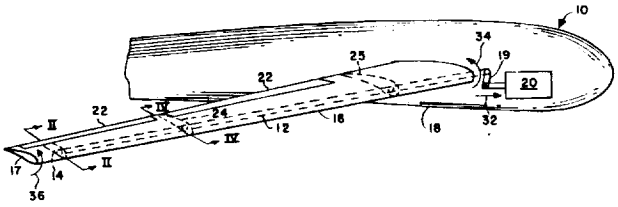
Wolf Elber, inventor (to NASA) Issued 18 May 1982 4 p Filed 28 Sep. 1979 Supersedes N80-16055 (18 - 07, p 0821)

(NASA-Case-LAR-12175-1; US-Patent-4,330,100; US-Patent-Appl-SN-079913; US-Patent-Class-244-48) Avail: US Patent and Trademark Office CSCL 01C

A control mechanism which provides active compensation for aerodynamically induced twist deformation of high aspect ratio wings consists of a torque tube, internal to each wing and

rigidly attached near the tip of each wing, which is moved by an actuator located in the aircraft fuselage. As changes in the aerodynamic loads on the wings occur the torque tube is rotated to compensate for the induced wing twist.

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

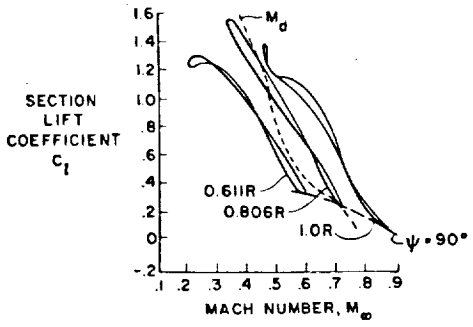


N82-33372*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

FAMILY OF AIRFOIL SHAPES FOR ROTATING BLADES Patent Application

Kevin W. Noonan, inventor (to NASA) Filed 25 Jun. 1982 23 p (NASA-Case-LAR-12843-1; US-Patent-Appl-SN-392096) Avail: NTIS HC A02/MF A01 CSCL 01C

A rotor blade used primarily for a helicopter which has airfoil sections and an overall configuration of a particular shape is described. The upper surface of the airfoil section is shaped such that there is a general reduction in the surface slope from the leading edge to the maximum ordinate at approximately 35% chord. Behind the termination of positive slope, the upper surface slope is negative and decreases continuously to a position of about 70% chord, at which point the surface slope increases continuously to the trailing edge. From the point the lower surface leading edge fairs into the lower surface, the lower surface slope is negative and increases continuously to approximately the 44% chord. The lower surface slope is positive and increases continuously to about the 65% chord, aft of which the positive slope decreases continuously to about the 75% chord. The positive slope then increases continuously from 75% chord to the airfoil trailing edge. The rotor airfoil is shaped to maintain desired values of pitching moment coefficient over a wide range of lift coefficients and increase the drag divergence Mach number, resulting in increased power efficiency and blade stability. NASA



06 AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

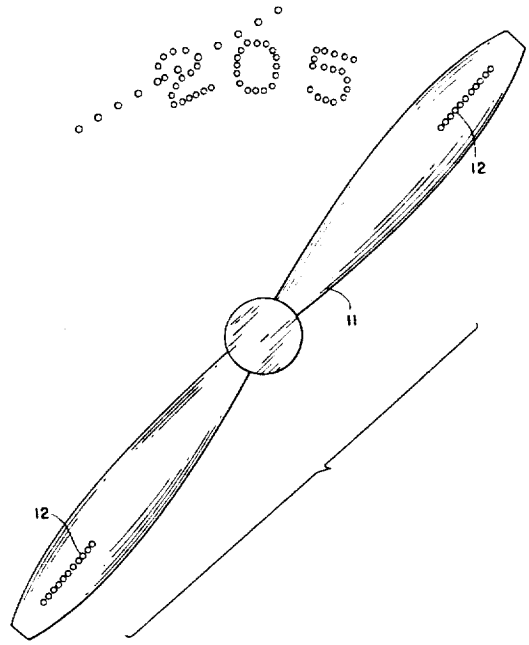
For related information see also *19 Spacecraft Instrumentation* and *35 Instrumentation and Photography*.

N82-29319*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

HEADS UP DISPLAY Patent Application

H. Douglas Garner and William E. Howell, inventors (to NASA) Filed 28 May 1982 12 p (NASA-Case-LAR-12630-1; US-Patent-Appl-SN-383384) Avail: NTIS HC A02/MF A01 CSCL 01D

A heads up aircraft display which allows the pilot to view the display without diverting his attention from the scene ahead is disclosed. The display is designed for use on propeller driven aircraft comprised of a radially disposed row of lamps embedded in the rear surface of a propeller. Measurements of flight data are made by conventional means and converted into digital signals. These digital signals are applied to graphic generators which control lamp drivers which in turn control lamps through slip rings. The lamps are lit at the appropriate times during each revolution of the propeller to display the flight data in graphic form to the pilot. The combination of graphic generators and radially disposed lamps embedded in an aircraft propeller enables the pilot to view the display without diverting his attention from the scene ahead. NASA



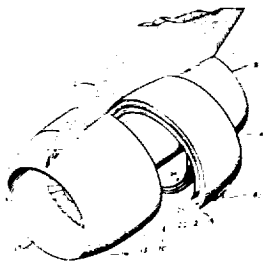
07 AIRCRAFT PROPULSION AND POWER

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

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

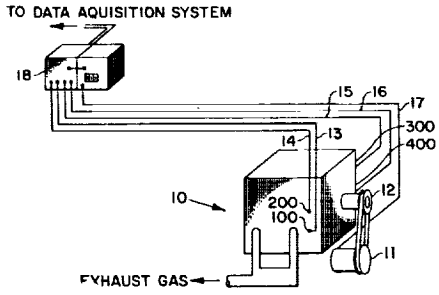
N82-26293* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THRUST REVERSER FOR A LONG DUCT FAN ENGINE Patent
Everett A. Johnston (GE, Cincinnati) and Edward W. Ryan, inventors (to NASA) (GE, Cincinnati) Issued 14 Jul. 1981 9 p Filed 30 Mar. 1979
(NASA-Case-LEW-13199-1; US-Patent-4,278,220; US-Patent-Appl-SN-025301; US-Patent-Class-244-110B; US-Patent-Class-60-226A) Avail: US Patent and Trademark Office CSCL 21E

A bypass duct outer cowl includes a fixed cascade disposed between axially spaced fixed cowl portions and a translatable cowl sleeve and blocker doors movably disposed on the respective radially outer and inner sides of the cascade. Actuation and linkage structure located entirely within the outer cowl provides for selectively moving the cowl sleeve rearwardly and rotating the blocker doors to a position across the bypass duct to cause the fan airflow to pass through the cascade in a thrust reversing manner. Official Gazette of the U.S. Patent and Trademark Office



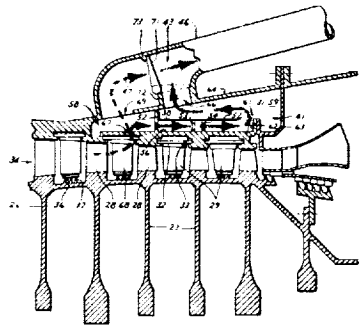
N82-26294*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
REAL TIME PRESSURE SIGNAL SYSTEM FOR A ROTARY ENGINE Patent Application
William J. Rice, inventor (to NASA) Filed 19 Feb. 1982 21 p (NASA-Case-LEW-13622-1; US-Patent-Appl-SN-350473) Avail: NTIS HC A02/MF A01 CSCL 21E

Apparatus for developing a signal which is a composite of the pressures at four different points in the chamber of a rotary type engine is disclosed. The composite signal can be read by an IMEP meter or displayed on an oscilloscope. The physical arrangement of a Wankel engine and the correlation embodying the invention is shown. The profile of the inner surface of a Wankel engine housing and the profile of a three lobed rotor together with the positions of the transducers are also shown. The timing diagrams depicting the active regions of the transducers and timing signals used in the correlator circuitry are illustrated. S.L.



N82-32366* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ACTIVE CLEARANCE CONTROL SYSTEM FOR A TURBOMACHINE Patent
Richard P. Johnston, Malcolm H. Knapp, and Charles E. Coulson, inventors (to NASA) Issued 11 May 1982 6 p Filed 25 Jul. 1979
(NASA-Case-LEW-12938-1; US-Patent-4,329,114; US-Patent-Appl-SN-060449; US-Patent-Class-415-145; US-Patent-Class-415-178; US-Patent-Class-60-726; US-Patent-Class-60-39.29; US-Patent-Class-60-39.07) Avail: US Patent and Trademark Office CSCL 21E

An axial compressor is provided with a cooling air manifold surrounding a portion of the shroud, and means for bleeding air from the compressor to the manifold for selectively flowing it in a modulating manner axially along the outer side of the stator/shroud to cool and shrink it during steady state operating conditions so as to obtain minimum shroud/rotor clearance conditions. Provision is also made to selectively divert the flow of cooling air from the manifold during transient periods of operation so as to alter the thermal growth or shrink rate of the stator/shroud and result in adequate clearance with the compressor rotor.
Official Gazette of the U.S. Patent and Trademark Office



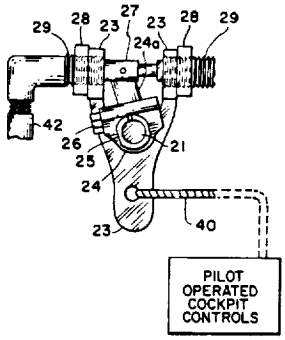
08 AIRCRAFT STABILITY AND CONTROL

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

N82-24206* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HYDRAULIC ACTUATOR MECHANISM TO CONTROL AIRCRAFT SPOILER MOVEMENTS THROUGH DUAL INPUT COMMANDS Patent
Stephen C. Irick, inventor (to NASA) Issued 9 Jun. 1981 5 p Filed 17 Aug. 1979 Supersedes N80-11065 (18 - 02, p 0148)
(NASA-Case-LAR-12412-1; US-Patent-4,272,046; US-Patent-Appl-SN-067595; US-Patent-Class-244-226; US-Patent-Class-244-78; US-Patent-Class-244,213; US-Patent-Class-74-480R; US-Patent-Class-74-479) Avail: US Patent and Trademark Office CSCL 01C

An aircraft flight spoiler control mechanism is described. The invention enables the conventional, primary spoiler control system to retain its operational characteristics while accommodating a secondary input controlled by a conventional computer system to supplement the settings made by the primary input. This is achieved by interposing springs between the primary input and the spoiler control unit. The springs are selected to have a stiffness intermediate to the greater force applied by the primary control linkage and the lesser resistance offered by the spoiler control unit. Thus, operation of the primary input causes the control unit to yield before the springs, yet, operation of the secondary input, acting directly on the control unit, causes the springs to yield and absorb adjustments before they are transmitted into the primary control system.

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



N82-32373* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

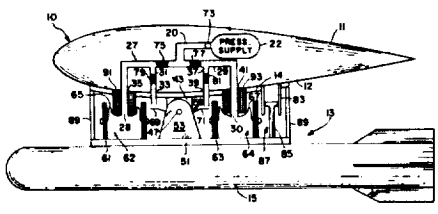
DECOUPLER PYLON: WING/STORE FLUTTER SUPPRESSOR Patent

Wilmer H. Reed, III, inventor (to NASA) Issued 10 Aug. 1982 9 p Filed 28 Mar. 1980 Supersedes N80-22359 (18 - 13, p 1673)

(NASA-Case-LAR-12468-1; US-Patent-4,343,447; US-Patent-Appl-SN-135057; US-Patent-Class-244-137R; US-Patent-Class-244-118.1; US-Patent-Class-89-1.5G) Avail: US Patent and Trademark Office CSCL 01C

A device for suspending a store from a support such as an aircraft wing and more specifically for increasing the flutter speed of an aircraft flying with attached store and reducing the sensitivity of flutter to changes in the pitch inertia and center of gravity location of the store is described. It comprises softspring where the store pitch mode is decoupled from support modes and a low frequency active control mechanism which maintains store alignment. A pneumatic suspension system both isolates the store in pitch and, under conditions of changing mean load, aligns the store with the wing to which it is attached.

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



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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).*

N82-23254* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

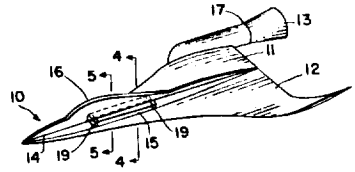
METRIC HALF-SPAN MODEL SUPPORT SYSTEM Patent

Charlie M. Jackson, Jr., Samuel M. Dollyhigh, and David S. Shaw, inventors (to NASA) Issued 4 May 1982 5 p Filed Supersedes N80-24334 (18 - 15, p 1943)

(NASA-Case-LAR-12441-1; US-Patent-4,327,581; US-Patent-Appl-SN-145210; US-Patent-Class-73-147) Avail: US Patent and Trademark Office CSCL 14B

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

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



N82-24212* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

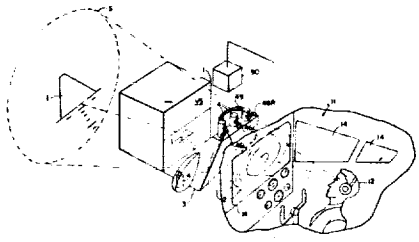
ENVIRONMENTAL FOG/RAIN VISUAL DISPLAY SYSTEM FOR AIRCRAFT SIMULATORS Patent

Wendell D. Chase, inventor (to NASA) Issued 2 Feb. 1982 28 p Filed 29 Jun. 1979 Supersedes N79-33220 (17 - 24, p 3180)

(NASA-Case-ARC-11158-1; US-Patent-4,313,726; US-Patent-Appl-SN-053566; US-Patent-Class-434-42; US-Patent-Class-434-43) Avail: US Patent and Trademark Office CSCL 14B

An environmental fog/rain visual display system for aircraft simulators is described. The electronic elements of the system include a real time digital computer, a caligraphic color display which simulates landing lights of selective intensity, and a color television camera for producing a moving color display of the airport runway as depicted on a model terrain board. The mechanical simulation elements of the system include an environmental chamber which can produce natural fog, nonhomogeneous fog, rain and fog combined, or rain only. A pilot looking through the aircraft wind screen will look through the fog and/or rain generated in the environmental chamber onto a viewing

screen with the simulated color image of the airport runway thereon, and observe a very real simulation of actual conditions of a runway as it would appear through actual fog and/or rain. Official Gazette of the U.S. Patent and Trademark Office



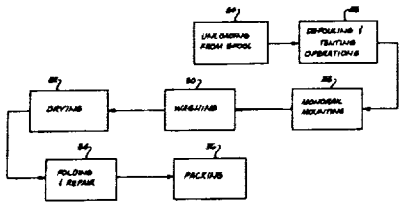
N82-29330* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

METHOD FOR REFURBISHING AND PROCESSING PARACHUTES Patent

Russell T. Crowell, inventor (to NASA) Issued 2 Feb. 1982 7 p Filed 30 May 1980 Supersedes N81-14967 (19 - 06, p 0706) Division of US Patent Appl. SN-862878, filed 12 Dec. 1977, US Patent-4,244,810

(NASA-Case-KSC-11042-1; US-Patent-4,313,291; US-Patent-4,244,810; US-Patent-Appl-SN-154663; US-Patent-Appl-SN-862878; US-Patent-Class-53-429; US-Patent-Class-8-150) Avail: US Patent and Trademark Office CSCL 14B

A system and method for refurbishing and processing parachutes is discussed including an overhead monorail conveyor system on which the parachute is suspended for horizontal conveyance. The parachute is first suspended in partially open tented configuration wherein open inspection of the canopy is permitted to remove debris and inspect all areas. Following inspection, the parachute is transported by the monorail conveyor to a washing and drying station with the parachute canopy mounted on the conveyor ina systematic arrangement which permits water and air to pass through the ribbonlike material of the canopy. Following drying of the parachute, the parachute is conveyed into an interior space where it is finally inspected and removed from the monorail conveyor and laid upon a table for folding. Official Gazette of the U.S. Patent and Trademark Office

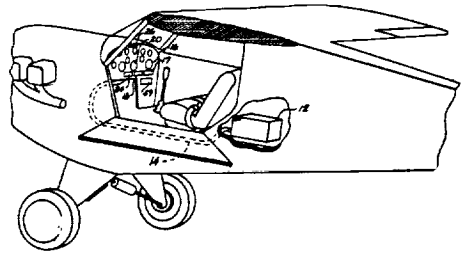


N82-29331*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

INFLIGHT IFR PROCEDURES SIMULATOR Patent Application

Lloyd C. Parker, inventor (to NASA) Filed 11 Jun. 1982 22 p (NASA-Case-KSC-11218-1; US-Patent-Appl-SN-387649) Avail: NTIS HC A02/MF A01 CSCL 14B

An in-flight trainer designed to train students in a conventional aircraft is disclosed. The trainer generates simulated signals and commands to conventional instruments provided in the aircraft that correspond to the normal signals a pilot receives during instrument flight rule (IFR) flights and landing and departure procedures. Results of studies conducted using apparatus which demonstrated the concept indicate that the concept is feasible. Also, students trained using only the In-flight IFR Simulator were more proficient in skills development than those trained using table-top simulators and in aircraft in the conventional manner. J.M.S.



15 LAUNCH VEHICLES AND SPACE VEHICLES

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

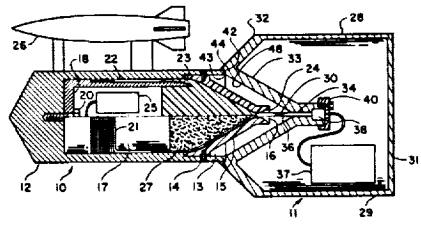
N82-24272* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

HIGH ACCELERATION CABLE DEPLOYMENT SYSTEM Patent

Thomas N. Canning, Christopher E. Barns, James P. Murphy, Bobby Gin, and Robert W. King, inventors (to NASA) Issued 9 Jun. 1981 6 p Filed 23 Apr. 1979 Supersedes N79-23432 (17 - 14, p 1857)

(NASA-Case-ARC-11256-1; US-Patent-4,271,761; US-Patent-Appl-SN-032305; US-Patent-Class-102-504; US-Patent-Class-242-128) Avail: US Patent and Trademark Office CSCL 16D

A deployment system that will safely pay one cable from a ballistic forebody when the forebody is separated from an afterbody (to which the cable is secured and when the separation is marked by high acceleration and velocity) is described. N.W.



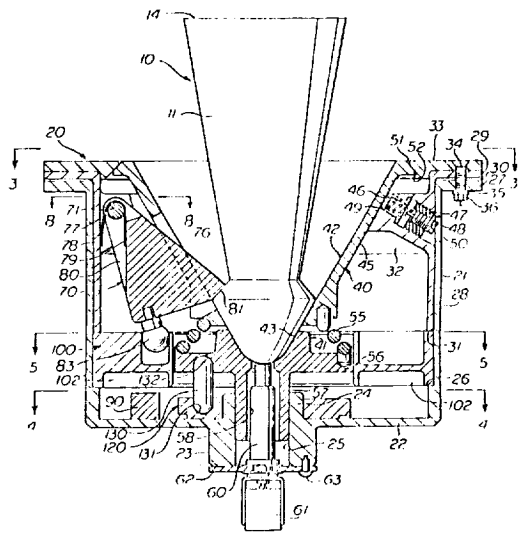
N82-28318*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

APPARATUS FOR RELEASABLY CONNECTING FIRST AND SECOND OBJECTS IN PREDETERMINED SPACE RELATIONSHIP Patent Application

Joseph A. Chandler, inventor (to NASA) Filed 14 Apr. 1982 21 p Sponsored by NASA

(NASA-Case-MSC-18969-1; US-Patent-Appl-SN-368189) Avail: NTIS HC A02/MF A01 CSCL 22A

Apparatus for allowing remote control of undocking and redocking of a space experiment vehicle to a supporting spacecraft is described. N.W.



16 SPACE TRANSPORTATION

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

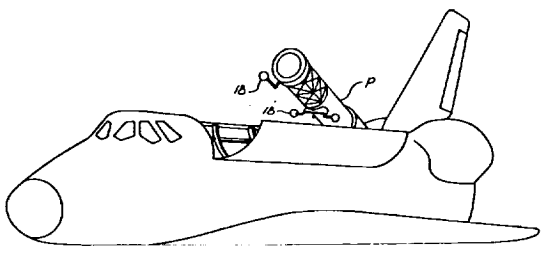
For related information see also *03 Air Transportation and Safety* and *85 Urban Technology and Transportation.*

N82-31398*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

HEMISPHERICAL LATCHING APPARATUS FOR PAYLOAD RETENTION Patent Application

Keith H. Clark, inventor (to NASA) Filed 23 Jul. 1982 18 p (NASA-Case-MFS-25837; US-Patent-Appl-SN-401282) Avail: NTIS HC A02/MF A01 CSCL 22B

An apparatus for securing payloads in a space vehicle such as the Space Shuttle is described. The apparatus includes many latching assemblies carried by a platform on the vehicle and a like number of latching elements carried by the payload and adapted to mate with the latching assemblies. The novelty of the invention is believed to reside in the use of complementary hemispherical elements which automatically align and engage with one another. This enables a simple but effective mode of operation and avoids the need for hinged linkages and similar moving parts. NASA



18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes spacecraft thermal and environmental control; and attitude control.

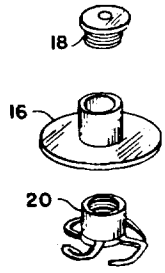
For life support systems see *54 Man/System Technology and Life Support.* For related information see also *05 Aircraft Design, Testing and Performance* and *39 Structural Mechanics.*

N82-33419*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

MECHANICAL FASTENER Patent Application

Albert B. Stacy, Jr., inventor (to NASA) Filed 25 Jun. 1982 14 p (NASA-Case-LAR-12738-1; US-Patent-Appl-SN-392095) Avail: NTIS HC A02/MF A01 CSCL 22B

A mechanical means of fastening a temporary replacement heat shield tile to the strain isolate pad of a space vehicle while the vehicle is in outer space is described. A flanged aluminum sleeve and an internally threaded, flanged, stainless steel cylinder are used. The flanged portion of the stainless steel cylinder consists of four 'L' shaped blades. Before using the assembled device, it is adhesively attached to a predrilled replacement heat shield tile. In using the device to attach the heat shield tile to the strain isolation pad, the brass plug and the stainless steel cylinder are rotated with respect to each other until the flanged portion of the stainless steel cylinder rests against the strain isolation pad and the brass plug is not in contract with the aluminum sleeve. The brass plug and the stainless steel cylinder are then simultaneously rotated with respect to the aluminum sleeve so that the 'L' shaped blades of the stainless steel cylinder grasp the strain isolation pad and fasten the heat shield tile. The brass plug is then rotated with respect to the stainless steel cylinder to draw the heat shield tile snug against the strain isolation pad and complete the connection. NASA



23 CHEMISTRY AND MATERIALS (GENERAL)

Includes biochemistry and organic chemistry.

N82-28353* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PREPARATION OF PERFLUORINATED 1,2,4-OXADIAZOLES Patent

Reinhold H. Kratzer (Ultrasystems, Inc., Irvine, Calif.), Kazimiera J. L. Paciorek (Ultrasystems, Inc., Irvine, Calif.), Thomas I. Ito (Ultrasystems, Inc., Irvine, Calif.), and Robert W. Rosser, inventors (to NASA) Issued 16 Feb 1982 5 p Filed 27 Jun. 1980 Supersedes N80-26407 (18 - 17, p 2239) (NASA-Case-ARC-11267-2; US-Patent-4,316,035;

US-Patent-Appl-SN-163838; US-Patent-Class-547-131; US-Patent-Class-528-401; US-Patent-Class-528-422; US-Patent-Class-564-229) Avail: US Patent and Trademark Office CSCL 07C

Fluorinated alkyl or alkylether 1,2,4 oxadiazole compounds are prepared by cyclizing the corresponding alkyl or alkylether imidoyl amidoximes in vacuo or in an inert atmosphere at a temperature within the range of 40 C to 100 C for a period of 8 to 144 hours in the presence of an acid compound which can accept ammonia to form a salt. The imidoyl amidoximes usable in this process are either polymeric or nonpolymeric. The products, when polymeric, have excellent heat, chemical and solvent resistance.

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

N82-29358* National Aeronautics and Space Administration Langley Research Center, Hampton, Va.

METHOD FOR FORMING PYRRONE MOLDING POWDERS AND PRODUCTS OF SAID METHOD Patent

Charles T. Hughes (Avco Corp., Cincinnati) and Robert J. McHenry, inventors (to NASA) (Avco Corp., Cincinnati) Issued 18 Apr. 1972 6 p Filed 17 Nov. 1969 Sponsored by NASA (NASA-Case-LAR-10423-1; US-Patent-3,657,190; US-Patent-Appl-SN-877445; US-Patent-Class-260-65) Avail: US Patent and Trademark Office CSCL 07C

The formation of pyrrone resins of the ladder or semiladder structure is described. The technique involves initial formation of fully cyclized prepolymers having an average degree of polymerization of about 1.5, one with acidic terminal groups, another with amine terminal groups. Thereafter the prepolymers are intimately admixed on a 1:1 stoichiometric basis. The resulting powder mixture is molded at elevated pressures and temperatures to form a fully cyclized resin.

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

24 COMPOSITE MATERIALS

Includes laminates.

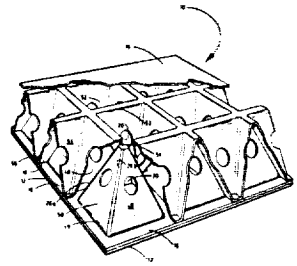
N82-24296* National Aeronautics and Space Administration, Hugh L. Dryden Flight Research Center, Edwards, Calif.

SUPERPLASTICALLY FORMED DIFFUSION BONDED METALLIC STRUCTURE Patent

William L. Ko, inventor (to NASA) Issued 29 Sep. 1981 8 p Filed 30 May 1979 Supersedes N79-25424 (17 - 16, p 2136)
(NASA-Case-FRC-11026-1; US-Patent-4,292,375; US-Patent-Appl-SN-043944; US-Patent-Class-428-593; US-Patent-Class-228-157; US-Patent-Class-244-119; US-Patent-Class-244-123; US-Patent-Class-428-604; US-Patent-Class-428-594) Avail: US Patent and Trademark Office CSCL 11D

A metallic sandwich structure particularly suited for use in aerospace industries comprising a base plate, a cover plate, and an orthogonally corrugated core is described. A pair of core plates formed of a superplastic alloy are interposed between the base plate and the cover plate and bonded. Each of the core plates is characterized by a plurality of protrusions comprising square-based, truncated pyramids uniformly aligned along orthogonally related axes perpendicularly bisecting the legs of the bases of the pyramids and alternately inverted along orthogonally related planes diagonally bisecting the pyramids, whereby an orthogonally corrugated core is provided.

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



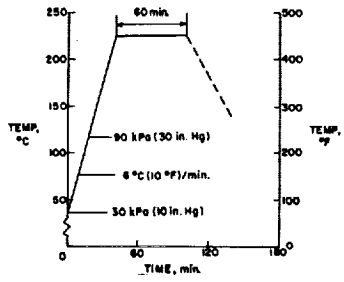
N82-25324*# National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.

GRAPHITE/POLYIMIDE STRUCTURAL APPLICATIONS Patent Application

Robert M. Baucom and Paul W. Kidder, inventors (to NASA) Filed 30 Nov. 1981 16 p
(NASA-Case-LAR-12547-1; US-Patent-Appl-SN-325934) Avail: NTIS HC A02/MF A01 CSCL 11D

An article of manufacture comprising a stabilized graphite/polyimide composite preform and the process for making same is disclosed. Sheets of graphite/polyimide prepreg are layered in a desired orientation and staged in an air circulation oven, under modest vacuum pressure and temperature to reduce the solvent content therein to less than one percent and to convert at least 25% of the resin to the oligomer form. The resulting preform is stable and may be stored under ambient conditions for an extended period of time without losing its desirable physical property characteristics. The preform may then be placed in the mold cavity of a preheated tool and shaped to desired contour by platen press-type curing methods. The preforming process stabilizes the fiber/polyimide prepreg and eliminates the need for the immediate use of prepregs as they are formed to prevent deterioration.

NASA



N82-26384* National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.

FUSELAGE STRUCTURE USING ADVANCED TECHNOLOGY FIBER REINFORCED COMPOSITES Patent

Robert K. Robinson (Boeing Commercial Airplane Co., Seattle) and Harry M. Tomlinson, inventors (to NASA) (Boeing Commercial Airplane Co., Seattle) Issued 12 Jan. 1982 9 p Filed 16 Feb. 1978 Supersedes N78-18045 (16 - 09, p 1111) Sponsored by NASA

(NASA-Case-LAR-11688-1; US-Patent-4,310,132; US-Patent-Appl-SN-878540; US-Patent-Class-244-119; US-Patent-Class-244-123; US-Patent-Class-244-132) Avail: US Patent and Trademark Office CSCL 11D

A fuselage structure is described in which the skin is comprised of layers of a matrix fiber reinforced composite, with the stringers reinforced with the same composite material. The high strength to weight ratio of the composite, particularly at elevated temperatures, and its high modulus of elasticity, makes it desirable for use in airplane structures.

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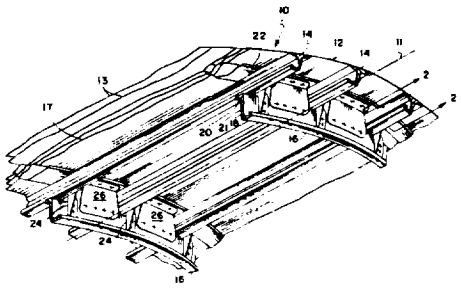


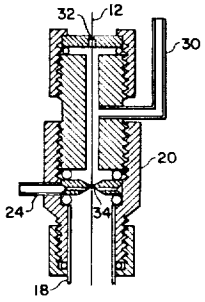
N82-26385*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

METHOD AND APPARATUS FOR STRENGTHENING BORON FIBERS Patent Application

James A. DiCarlo, inventor (to NASA) Filed 23 Apr. 1982 12 p

(NASA-Case-LEW-13826-1; US-Patent-Appl-SN-371354) Avail: NTIS HC A02/MF A01 CSCL 11D

The tensile strength of commercially available boron fibers produced by the chemical vapor deposition of boron onto tungsten wire substrates is increased by treating the fibers in an oxygen plus inert gas (argon) atmosphere to about 880 C. High temperature oxidation increases the residual compression of each tungsten core by forming a thin boron oxide coating on the fiber surface so that the fiber contracts axially. This increases the intrinsic strength of the fiber by raising the tensile strength level required for core initiated fracture. After cooling to room temperature the fibers are chemically polished to reduce their diameters by 0.2 mils to 0.6 mils. The reduction in diameter removes both original and oxidation induced surface flaws. The strengthened fibers are intended to be utilized as reinforcement in composite materials. Such materials may be boron/aluminum or boron/epoxy. NASA



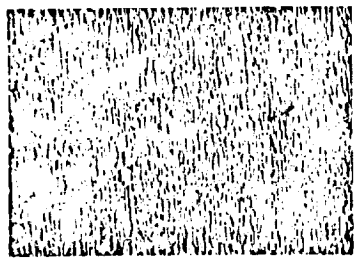
N82-26386*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ION BEAM TEXTURED GRAPHITE ELECTRODE PLATES Patent Application

James S. Sovey, Ralph Forman, Arthur N. Curren, and Edwin G. Wintucky, inventors (to NASA) Filed 31 Mar. 1982 14 p

(NASA-Case-LEW-12919-2; US-Patent-Appl-SN-364072) Avail: NTIS HC A02/MF A01 CSCL 11D

A specially textured surface of pyrolytic graphite exhibits extremely low yields of secondary electrons and reduced numbers of reflected primary electrons after impingement of high energy primary electrons. Electrode plates of this material are used in multistage depressed collectors. An ion flux having an energy between 500 eV and 1000 eV and a current density between 1.0 mA/sq cm and 6.0 mA/sq cm produces surface roughening or texturing which is in the form of needles or spires. Such textured surfaces are especially useful as anode collector plates in high efficiency electron tube devices. NASA



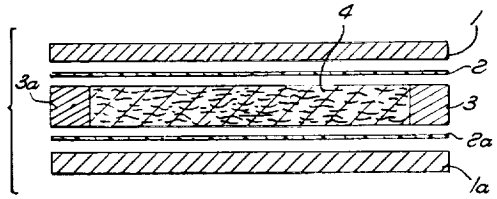
N82-26387*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

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

Thomas J. Ballantine, inventor (to NASA) (Rockwell International Corp., Downey, Calif.) Filed 25 Mar. 1982 10 p Sponsored by NASA

(NASA-Case-MSC-18934-3; US-Patent-Appl-SN-361711) Avail: NTIS HC A02/MF A01 CSCL 11D

A method of installing fragile, light-weight, high-temperature fiber insulation, particularly where the insulation is to be used as a seal strip providing a high order of thermal barrier insulation is described. The process is based on provision of a strip of the mineral batting cut oversize by a predetermined amount, saturated in a fugitive polymer solution, compressed in a mold, dried and cured to form a rigidized batting material which may be machined to required shape. The machined dimensions would normally be at least nominally less than the dimensions of the cavity to be sealed. After insertion in the cavity, which may be a wire-mesh seal enclosure, the apparatus is subjected to baking at a temperature sufficiently high to cause the resin to burn off cleanly, leaving the batting substantially in its original condition and expanded into the cavity or seal enclosure. NASA



N82-26388*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

HIGH TEMPERATURE SILICON CARBIDE IMPREGNATED INSULATING FABRICS Patent Application

Calvin Schomburg and Robert L. Dotts, inventors (to NASA) Filed 6 Apr. 1982 10 p

(NASA-Case-MSC-18832-1; US-Patent-Appl-SN-365950) Avail: NTIS HC A02/MF A01 CSCL 11E

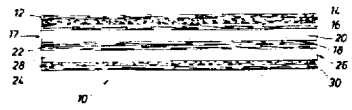
A gap filler used between the tiles on the space shuttle comprises a high temperature, flexible, insulating fabric of closely woven heat resistant fibers having silicon carbide dispersed through the fabric and bonded to the fibers with an emulsifiable polyethylene wax. Suitable fibers include silica fibers having a diameter of 1 micron to 3 microns, and alumina borosilicate fibers having a diameter of 10 microns to 12 microns. The woven fabric of such fibers can be impregnated with the following typical composition: butyl alcohol (82% by weight), silicon carbide (12% by weight), and emulsifiable polyethylene wax (6% by weight). The butyl alcohol acts as a carrier and is evaporated off. The silicon carbide imparts a high temperature emittance, and the wax enables the fabric to retain its integrity and flexibility. NASA

N82-26389*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
THERMAL PROTECTION SYSTEM Patent Application
Ronald W. Graese (Martin Marietta Corp., Denver) and Ronnie L. Campbell (Martin Marietta Corp., Denver) Filed 9 Apr. 1982 12 p Sponsored by NASA
(NASA-Case-MSC-18796-1; US-Patent-Appl-SN-367121) Avail: NTIS HC A02/MF A01 CSCL 11D

A cure-in-place ablative composition is described. The composition can be mixed, applied, and cured under the ambient conditions encountered in outer space. The cured composition functions both as an adhesive and an ablator. The composition consists essentially of a resin mixture of a methyl phenyl polysiloxane and tetraethyl orthosilicate with gama-amino propyl triethoxy silane as the catalyst. The composition also contains minor amounts of dimethyl polysiloxane as a diluent and minor amounts of silica compounds as fillers.
Official Gazette of the U.S Patent and Trademark Office

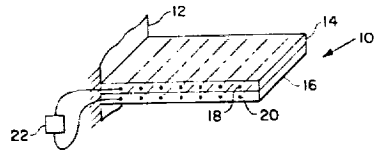
N82-29362* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
ABSORBENT PRODUCT TO ABSORB FLUIDS Patent
Frederic S. Dawn and James V. Correale, inventors (to NASA) Issued 6 Jul. 1982 6 p Filed 24 Dec. 1980 Supersedes N81-16127 (19 - 07, p 0870)
(NASA-Case-MSC-18223-1; US-Patent-4,338,371; US-Patent-Appl-SN-219681; US-Patent-Class-428-283; US-Patent-Class-128-280; US-Patent-Class-128-283; US-Patent-Class-128-284; US-Patent-Class-128-285; US-Patent-Class-128-288; US-Patent-Class-128-291; US-Patent-Class-128-296; US-Patent-Class-428-284; US-Patent-Class-428-286; US-Patent-Class-428-287; US-Patent-Class-428-288) Avail: US Patent and Trademark Office CSCL 11D

A multi-layer absorbent product for use in contact with the skin to absorb fluids is discussed. The product utilizes a water pervious facing layer for contacting the skin, overlayed by a first fibrous wicking layer, the wicking layer preferably being of the one-way variety in which fluid or liquid is moved away from the facing layer. The product further includes a first container section defined by inner and outer layer of a water pervious wicking material between which is disposed a first absorbent mass. A second container section defined by inner and outer layers between which is disposed a second absorbent mass and a liquid impermeable/gas permeable layer. Spacesuit applications are discussed.
Official Gazette of the U.S. Patent and Trademark Office



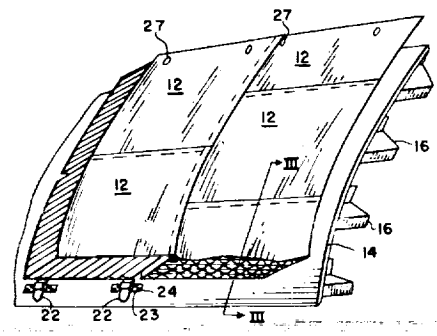
N82-31450*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PIEZOELECTRIC COMPOSITE MATERIALS Patent Application
L. J. Kiraly, inventor (to NASA) Filed 12 Jul. 1982 9 p
(NASA-Case-LEW-12582-1; US-Patent-Appl-SN-397281) Avail: NTIS HC A02/MF A01 CSCL 11D

A laminated structural device that has the ability to change shape, position and resonant frequency without using discrete motive components is described. The laminate may be a combination of layers of a piezoelectrically active, non-conductive matrix material. A power source selectively places various levels of charge an electrically conductive filaments imbedded in the respective layers to produce various configurations in a predetermined manner. The layers may be electrically conductive, having imbedded piezoelectrically active filaments. A combination of layers of electrically conductive material may be laminated to layers of piezoelectrically active material. NASA



N82-32417* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MULTIWALL THERMAL PROTECTION SYSTEM Patent
Liam R. Jackson, inventor (to NASA) Issued 17 Aug. 1982 9 p Filed 5 Sep. 1979 Supersedes N80-12117 (18 - 03, p 0295)
(NASA-Case-LAR-12620-1; US-Patent-4,344,591; US-Patent-Appl-SN-072857; US-Patent-Class-244-158A; US-Patent-Class-244-132; US-Patent-Class-428-594; US-Patent-Class-428-604; US-Patent-Class-428-607; US-Patent-Class-428-608) Avail: US Patent and Trademark Office CSCL 11D

Multiwall insulating sandwich panels are provided for thermal protection of hypervelocity vehicles and other enclosures. In one embodiment, the multiwall panels are formed of alternate layers of dimpled and flat metal (titanium alloy) foil sheets and beaded scarfed edge seals to provide enclosure thermal protection up to 1000 F. An additional embodiment employs an intermediate fibrous insulation for the sandwich panel to provide thermal protection up to 2000 F. A third embodiment employs a silicide coated columbium waffle as the outer panel skin and fibrous layered intermediate protection for thermal environment protection up to 2500 F. The use of multiple panels on an enclosure facilitate repair and refurbishment of the thermal protection system due to the simple support provided by the tab and clip attachment for the panels.
Official Gazette of the U.S. Patent and Trademark Office



25 INORGANIC AND PHYSICAL CHEMISTRY

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

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

N82-22329*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

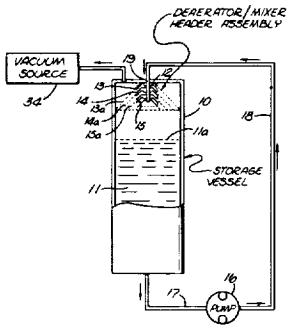
DEAERATOR/MIXER FOR LIQUIDS Patent Application

Samual T. Yamauchi, inventor (to NASA) (Rockwell International Corp., Downey, Calif.) Filed 25 Nov. 1981 13 p Sponsored by NASA

(NASA-Case-MSC-18936-1; US-Patent-Appl-SN-325082) Avail: NTIS HC A02/MF A01 CSCL 07D

A liquid degassifier including a containment vessel, a liquid pump, and a header assembly within the containment vessel is described. The pump draws from a reservoir and outputs to the header assembly, the latter being constructed to return the liquid to the reservoir in the form of a stacked plurality of vertically spaced, concentric, conical cascades via a series of orifices. The vacuum source which provides a partial vacuum in the containment vessel to enhance the degassing process is also described.

NASA



N82-23282* National Aeronautics and Space Administration. Pasadena Office, Calif.

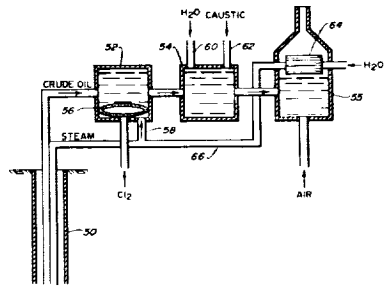
CRUDE OIL DESULFURIZATION Patent

John J. Kalvinskas (California Inst. of Technology, Pasadena), George C. Hsu (California Inst. of Technology, Pasadena), and John B. Ernest, inventors (to NASA) (California Inst. of Technology, Pasadena) Issued 12 Jan. 1982 4 p Filed 17 Apr. 1979 Sponsored by NASA

(NASA-Case-NPO-14542-1; US-Patent-4,310,049; US-Patent-Appl-SN-030831; US-Patent-Class-166-267; US-Patent-Class-166-303; US-Patent-Class-208-241) Avail: US Patent and Trademark Office CSCL 07D

High sulfur crude oil is desulfurized by a low temperature (25-80 C.) chlorinolysis at ambient pressure in the absence of organic solvent or diluent but in the presence of water (water/oil = 0.3) followed by a water and caustic wash to remove sulfur and chlorine containing reaction products. The process described can be practiced at a well site for the recovery of desulfurized oil used to generate steam for injection into the well for enhanced oil recovery.

Author



N82-24312* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

THE 1,1,1-TRIARYL-2,2,2-TRIFLUOROETHANES AND PROCESS FOR THEIR SYNTHESIS Patent

William D. Kray (Talladega Coll.) and Robert W. Rosser, inventors (to NASA) Issued 22 Dec. 1981 5 p Filed 30 Mar. 1978 Supersedes N78-21154 (16 - 13, p 1674)

(NASA-Case-ARC-11097-1; US-Patent-4,307,024; US-Patent-Appl-SN-891872; US-Patent-Class-260-389; US-Patent-Class-260-386; US-Patent-Class-570-123; US-Patent-Class-570-129; US-Patent-Class-528-402) Avail: US Patent and Trademark Office CSCL 07D

New 1,1,1-triaryl-2,2,2-trifluoroethanes in which the aryl radicals carry one or more substituents were prepared by condensation of trifluoroacetophenones with substituted phenyl compounds in the presence of catalytic quantities of trifluoromethylsulfonic acid. The reaction can be carried out under reflux in toluene or, for strikingly better results in certain cases, reactants are simply stirred at room temperature for about 24 to 48 hours.

Author

N82-25335*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

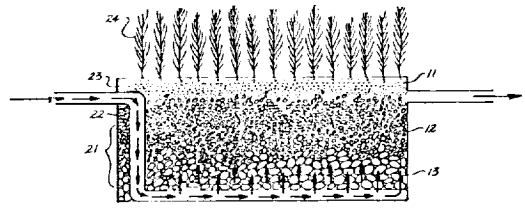
METHOD FOR TREATING WASTEWATER USING MICROORGANISMS AND VASCULAR AQUATIC PLANTS Patent Application

Billy C. Wolverton, Inventor (to NASA) Filed 28 Dec. 1981 22 p

(NASA-Case-NSTL-10-1; US-Patent-Appl-SN-335036) Avail: NTIS HC A02/MF A01 CSCL 07D

An invention relating to waste water treatment is described. The waste water is subjected to anaerobic settling for at least six hours, the resulting effluent passing upward through a filter cell in which the effluent is first subjected to the action of an aerobic and facultative microorganisms and then to aerobic microorganisms and the roots of a vascular aquatic plant. Details of the processes are given. The novelty of the invention resides in the combined use of microorganisms and aquatic plant roots in a filter bed. This enables removal of phosphorous, ammonia and potassium impurities which are not normally removed by bacteria alone.

NASA



N82-26396* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ELECTRICALLY CONDUCTIVE PALLADIUM CONTAINING POLYIMIDE FILMS Patent

Larry T. Taylor (Virginia Polytechnic Inst. and State Univ.), Anne K. St.Clair, Vicki C. Carver (Virginia Polytechnic Inst. and State Univ.), and Thomas A. Furtsch, inventors (to NASA) (Virginia Polytechnic Inst. and State Univ.) Issued 19 Jan. 1982 5 p Filed 28 Mar. 1980 Supersedes N80-24549 (18 - 15, p 1974)

(NASA-Case-LAR-12705-1; US-Patent-4,311,615; US-Patent-Appl-SN-135058; US-Patent-Class-252-514) Avail: US Patent and Trademark Office CSCL 07D

Lightweight, high temperature resistant, electrically conductive, palladium containing polyimide films and methods for their preparation are described. A palladium (II) ion-containing polyamic acid solution is prepared by reacting an aromatic dianhydride with an equimolar quantity of a palladium II ion-containing salt or complex and the reactant product is cast as a thin film onto a surface and cured at approximately 300 C to produce a flexible electrically conductive cyclic palladium containing polyimide. The source of palladium ions is selected from the group of palladium II compounds consisting of LiPdCl4, Pd[S(CH3)2] C12Na2PDC14, and PdC12. The films have application to aerodynamic and space structures and in particular to the relieving of space charging effects.

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

N82-26397*# National Aeronautics and Space Administration. Pasadena Office, Calif.

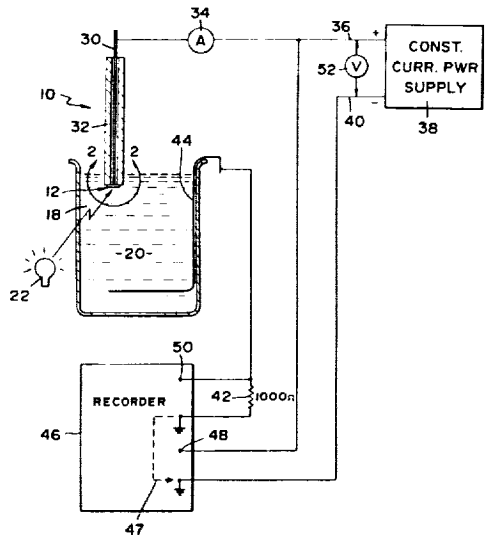
EPITAXIAL THINNING PROCESS Patent Application

Clifford M. Siegel, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 6 Apr. 1982 15 p

(Contract NAS7-100)

(NASA-Case-NPO-15786-1; US-Patent-Appl-SN-366103) Avail: NTIS HC A02/MF A01 CSCL 07D

A method is described for thinning an epitaxial layer of a wafer that is to be used in producing diodes having a specified breakdown voltage and which also facilitates the thinning process. Current is passed through the epitaxial layer, by connecting a current source between the substrate of the wafer and an electrolyte in which the wafer is immersed. When the wafer is initially immersed, the voltage across the wafer initially drops and then rises at a steep rate (from 56 to 58). When light is applied to the wafer the voltage drops (from 60 to 62), and when the light is interrupted the voltage rises again (from 66 to 68). These changes in voltage, each indicate the breakdown voltage of a Schottky diode that could be prepared from the wafer at that time. NASA



N82-28368* National Aeronautics and Space Administration. Pasadena Office, Calif.

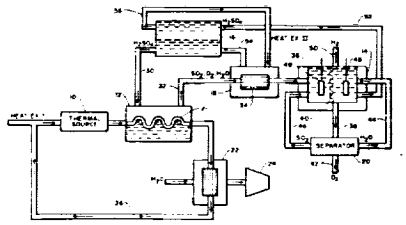
THERMOCHEMICAL GENERATION OF HYDROGEN Patent

Daniel D. Lawson (JPL, California Inst. of Tech., Pasadena) and Gene R. Petersen, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 9 Feb. 1982 7 p Filed 30 Apr. 1980 Supersedes N80-23394 (18 - 14, p 1814) Sponsored by NASA

(NASA-Case-NPO-15015-1; US-Patent-4,314,984; US-Patent-Appl-SN-145207; US-Patent-Class-423-579; US-Patent-Class-203-12; US-Patent-Class-422-186; US-Patent-Class-422-198; US-Patent-Class-423-235; US-Patent-Class-423-539; US-Patent-Class-423-540; US-Patent-Class-423-542; US-Patent-Class-423-648R) Avail: US Patent and Trademark Office CSCL 07D

The direct fluid contact heat exchange with H2SO4 at about 330 C prior to high temperature decomposition at about 830 C in the oxygen release step of several thermochemical cycles for splitting water into hydrogen and oxygen provides higher heat transfer rates, savings in energy and permits use of cast vessels rather than expensive forged alloy indirect heat exchangers. Among several candidate perfluorocarbon liquids tested, only perfluoropropylene oxide polymers having a degree of polymerization from about 10 to 60 were chemically stable, had low miscibility and vapor pressure when tested with sulfuric acid at temperatures from 300 C to 400 C.

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



N82-29370* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

AQUEOUS ALKALI METAL HYDROXIDE INSOLUBLE CELLULOSE ETHER MEMBRANE Patent

Howard E. Hoyt (Borden, Inc., New York) and Helmuth L. Pfluger, inventors (to NASA) (Borden, Inc., New York) Issued 6 May 1969 3 p Filed 6 Apr. 1965 Sponsored by NASA

(NASA-Case-XGS-05584-1; NASA-Case-XGS-07375-1; NASA-Case-XGS-07397-1; US-Patent-3,442,674; US-Patent-Appl-SN-446071; US-Patent-Class-106-197) Avail: US Patent and Trademark Office CSCL 07D

A membrane that is insoluble in an aqueous alkali metal hydroxide medium is described. The membrane is a resin which is a water-soluble C2-C4 hydroxyalkyl cellulose ether polymer and an insolubilizing agent for controlled water sorption, a dialytic and electrodialytic membrane. It is particularly useful as a separator between electrodes or plates in an alkaline storage battery.

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

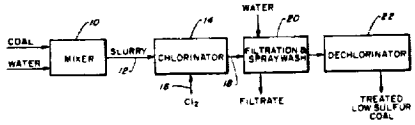
N82-29371* National Aeronautics and Space Administration. Pasadena Office, Calif.

COAL DESULFURIZATION BY AQUEOUS CHLORINATION Patent

John J. Kalvinskas (JPL, California Inst. of Tech., Pasadena), Nick Vasilakos (JPL, California Inst. of Tech., Pasadena), William H. Corcoran (JPL, California Inst. of Tech., Pasadena), Karel Grohmann (JPL, California Inst. of Tech., Pasadena), and Naresh K. Rohatgi, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 20 Apr. 1982 11 p Filed 12 May 1980 Sponsored by NASA

(NASA-Case-NPO-14902-1; US-Patent-4,325,707; US-Patent-Appl-SN-156790; US-Patent-Class-44-1SR; US-Patent-Class-201-17) Avail: US Patent and Trademark Office CSCL 07D

A method of desulfurizing coal is described in which chlorine gas is bubbled through an aqueous slurry of coal at low temperature below 130 C., and at ambient pressure. Chlorinolysis converts both inorganic and organic sulfur components of coal into water soluble compounds which enter the aqueous suspending media. The media is separated after chlorinolysis and the coal dechlorinated at a temperature of from 300 C to 500 C to form a non-caking, low-sulfur coal product.
Official Gazette of U.S. Patent and Trademark Office

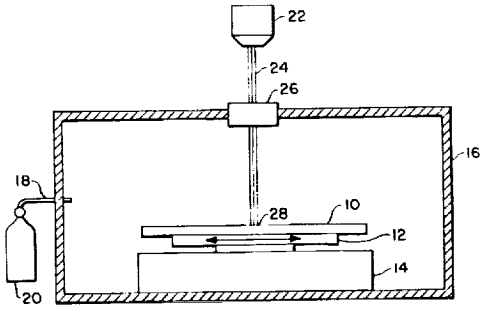


26 METALLIC MATERIALS

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

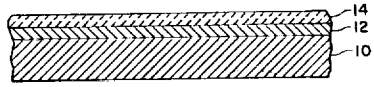
N82-22347*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD AND APPARATUS FOR COATING SUBSTRATES USING LASERS Patent Application
Isidor Zaplatynsky, inventor (to NASA) Filed 15 Mar. 1982 9 p
(NASA-Case-LEW-13526-1; US-Patent-Appl-SN-358398) Avail: NTIS HC A02/MF A01 CSCL 11F

A method for coating substrates using lasers is described. Metal substrates, preferably of titanium and titanium alloys, were coated by alloying or forming TiN on a substrate surface. In the process a laser beam strikes the surface of a moving substrate in the presence of purified nitrogen gas. A small area of the substrate surface is quickly heated, without melting, and reacts with the nitrogen to form a solid solution. This process of alloying or forming TiN, which occurs by diffusion of nitrogen into the titaninum, is reviewed. NASA



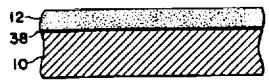
N82-26431*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio.
IMPROVED THERMAL BARRIER COATING SYSTEM Patent Application
Stephan Stecura, inventor (to NASA) Filed 6 May 1982 13 p
(NASA-Case-LEW-13324-1; US-Patent-Appl-SN-375784) Avail: NTIS HC A02/MF A01 CSCL 11F

A high temperature oxidation resistant thermal barrier coating system for a nickel-, cobalt-, or iron-base alloy substrate is described. An inner metal bond coating contacts the substrate, and a thermal barrier coating covers the bond coating. NiCrAlR, and CoCrAlR alloy are satisfactory as bond coating compositions where R = Y or Yb. These alloys contain, by weight, 0-35% chromium, 6-18% aluminum, and 0.05 to 1.55% yttrium or 0.05 to 3.0% ytterbium. The coatings containing ytterbium are preferred over those containing yttrium. An outer thermal barrier coating of partially stabilized zirconium oxide (zirconia) which is between 6% and 8%, by weight, of yttrium oxide (yttria) covers the bond coating. Partial stabilization provides a material with superior durability. Partially stabilized zirconia consists of mixtures of cubic, tetragonal, and monoclinic phases. NASA



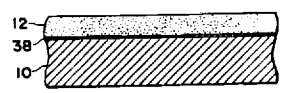
N82-29415* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
REFRACTORY COATINGS AND METHOD OF PRODUCING THE SAME Patent
William A. Brainard and Donald R. Wheeler, inventors (to NASA) Issued 22 Jun. 1982 4 p Filed 7 Dec. 1979 Supersedes N80-14232 (18 - 05, p 0583)
(NASA-Case-LEW-13169-1; US-Patent-4,336,117; US-Patent-Appl-SN-102003; US-Patent-Class-204-192C) Avail: US Patent and Trademark Office CSCL 11F

The adhesion, friction, and wear properties of sputtered refractory coatings on substrates of materials that form stable nitrides is improved by placing each substrate directly below a titanium carbide target of a commercial radiofrequency diode apparatus in a vacuum chamber. Nitrogen is bled into the system through a nozzle resulting in a small partial pressure of about 0.5% to 2.5% during the first two minutes of deposition. The flow of nitrogen is then stopped, and the sputtering ambient is reduced to pure argon through a nozzle without interrupting the sputtering process. When nitrogen is deliberately introduced during the crucial interface formation, some of the titanium at the interface reacts to form titanium nitride while the metal of the substrate also forms the nitride. These two nitrides atomically mixed together in the interfacial region act to more strongly bond the growing titanium carbide coating as it forms on the substrate.
Official Gazette of the U.S. Patent and Trademark Office



N82-30371* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
REFRACTORY COATINGS Patent
William A. Brainard and Donald R. Wheeler, inventors (to NASA) Issued 27 Jul. 1982 4 p Filed 29 Sep. 1980 Division of US Patent Appl. SN-102003, filed 7 Dec. 1979
(NASA-Case-LEW-13169-2; US-Patent-4,341,843; US-Patent-Appl-SN-191746; US-Patent-Appl-SN-102003; US-Patent-Class-428-457; US-Patent-Class-204-192C; US-Patent-Class-428-472) Avail: US Patent and Trademark Office CSCL 11F

A thin sputtered film is discussed which exhibits improved adherence to a substrate and has improved friction and wear characteristics. Each substrate is placed directly below a titanium carbide target of a commercial radiofrequency diode apparatus in a vacuum chamber. Nitrogen is bled into the system through a nozzle resulting in a small partial pressure of about 0.5% to 2.5% during the first two minutes of deposition. The flow of nitrogen is then stopped, and the sputtering ambient is reduced to pure argon through a nozzle without interrupting the sputtering process.
Official Gazette of the U.S. Patent and Trademark Office



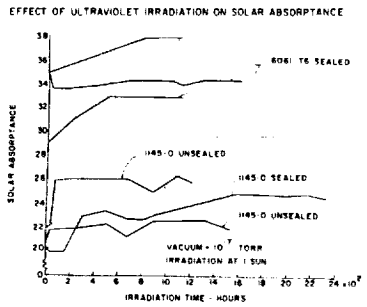
N82-31505* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NICRAL TERNARY ALLOY HAVING IMPROVED CYCLIC OXIDATION RESISTANCE Patent
Charles A. Barrett (NAS-NRC, Washington, D.C.), Carl E. Lowell (NAS-NRC, Washington, D.C.), and Abdus S. Khan (NAS-NRC, Washington, D.C.) Issued 20 Jul. 1982 3 p Filed 23 Oct. 1980 Supersedes N81-12211 (19 - 03, p 0322) Sponsored by NASA (NASA-Case-LEW-13339-1; US-Patent-4,340,425; US-Patent-Appl-SN-199769; US-Patent-Class-148-428; US-Patent-Class-420-445; US-Patent-Class-420-551; US-Patent-Class-420-588) Avail: US Patent and Trademark Office CSCL 11F

NiCrAl alloys are improved by the addition of zirconium. These alloys are in the Beta or gamma/gamma' + Beta region of the ternary system. Zirconium is added in a very low amount between 0.06 and 0.20 weight percent. There is a narrow optimum zirconium level at the low value of 0.13 weight percent. Maximum resistance to cyclic oxidation is achieved when the zirconium addition is at the optimum value.

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

N82-31508*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
VARIABLE ANODIC THERMAL CONTROL COATING Patent Application
Charles S. Gilliland and Roy J. Duckett, inventors (to NASA) Filed 9 Apr. 1982 13 p
(NASA-Case-LAR-12719-1; US-Patent-Appl-SN-367134) Avail: NTIS HC A02/MF A01 CSCL 11F

This invention relates to a process for providing a variable anodic thermal control coating to aluminum surfaces for use as the external surface area of space vehicles to passively control the temperature of the vehicle when exposed to a spatial environment. In a specific embodiment, a 0.001 inch thick aluminum surface is cleaned by immersion in a metal cleaning bath (160 F to 200 F for ten minutes); rinsed in room temperature water; deoxidized in a chromic acid and sulfric acid mixture; rinsed again with water and dried under forced, filtered air. After the chromic acid coating is applied, the surface is removed from the chromic acid, rinsed in a sealing bath of clear water at 170 F to 200 F for ten minutes, and dried with forced, filtered air at ambient temperature. The novelty of the invention appears to reside in a process for providing a thermal control solar stable surface coating for aluminum surfaces adapted to be exposed to solar radiation wherein selected values within the range of 0.10 to 0.72 thermal emittance and 0.2 to 0.4 solar absorptance are reproducibly obtained by anodizing the aluminum surface area in a chromic acid solution for a selected period of time. NASA



27 NONMETALLIC MATERIALS

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

N82-24338* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PREPARATION OF CROSSLINKED 1,2,4-OXADIAZOLE POLYMER Patent
Robert W. Rosser (San Jose State Univ.), Ibrahim M. Shalhoub (San Jose State Univ.), and Hanoi Kwong, inventors (to NASA) (San Jose State Univ.) Issued 16 Jun. 1981 3 p Filed 30 Apr. 1980 Division of US Patent Appl. SN-028301, filed 9 Apr. 1979 Sponsored by NASA
(NASA-Case-ARC-11253-2; US-Patent-4,273,918; US-Patent-Appl-SN-145284; US-Patent-Appl-SN-028301; US-Patent-Class-528-310; US-Patent-Class-528-328; US-Patent-Class-528-362; US-Patent-Class-528-401; US-Patent-Class-528-422) Avail: US Patent and Trademark Office

New crosslinked 1,2,4-oxadiazole elastomers were prepared by thermally condensing a monomer having the formula H2N(HON)C-R-Q, wherein Q is a triazine ring-forming group such as nitrile or amidine or a mixture of such group with amidoxime, or a mixture of said monomer with R [C(NOH)NH2] sub 2 with R in these formulas standing for a bivalent organic radical. In the monomer charge, the overall proportions of amidoxime groups to triazine ring-forming groups varies depending on the extent of crosslinking desired in the final polymer. M.K.

N82-24339* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
ADJUSTABLE HIGH EMITTANCE GAP FILLER Patent
Daniel B. Leiser (Stanford Univ., Calif.), David A. Stewart, Marnell Smith, Carlos A. Estrella, and Howard E. Goldstein, inventors (to NASA) Issued 29 Dec. 1981 7 p Filed 7 May 1980 Supersedes N80-23454 (18 - 14, p 1822)
(NASA-Case-ARC-11310-1; US-Patent-4,308,309; US-Patent-Appl-SN-147700; US-Patent-Class-428-193; US-Patent-Class-102-289; US-Patent-Class-244-121; US-Patent-Class-244-158A; US-Patent-Class-244-160; US-Patent-Class-428-49; US-Patent-Class-428-192; US-Patent-Class-428-241; US-Patent-Class-428-242; US-Patent-Class-428-245; US-Patent-Class-428-251; US-Patent-Class-428-257; US-Patent-Class-428-260; US-Patent-Class-428-266; US-Patent-Class-428-447; US-Patent-Class-428-448) Avail: US Patent and Trademark Office CSCL 07C

A flexible, adjustable refractory filler is disclosed for filling gaps between ceramic tiles forming the heat shield of a space shuttle vehicle, to protect its aluminum skin during atmospheric reentry. The easily installed and replaced filler consists essentially of a strip of ceramic cloth coated, at least along both its longitudinal edges with a room temperature vulcanizable silicone rubber compound with a high emittance colored pigment. The filler may have one or more layers as the gap width requires, and a rubber compounded with silicon tetraboride as the emittance agent and finely divided borosilicate glass containing about 7.5% B2O3 as high temperature binder. The filler cloth strip or tape

is cut to proper width and length, inserted into the gap, and fastened with previously applied drops of silicone rubber adhesive.

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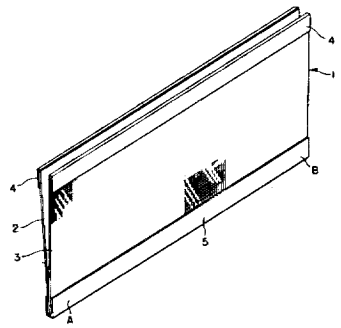

N82-24340* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

METHOD OF BONDING PLASTICIZED ELASTOMER TO METAL AND ARTICLES PRODUCED THEREBY Patent

William T. White, Johnny M. Clemons, and Frank E. Ledbetter, III, inventors (to NASA) Issued 27 Apr. 1982 3 p Filed 19 Dec. 1980 Supersedes N81-16238 (19 - 07, p 0886)
(NASA-Case-MFS-25181-1; US-Patent-4,327,150; US-Patent-Appl-SN-218585; US-Patent-Class-428-332; US-Patent-Class-156-315; US-Patent-Class-156-338; US-Patent-Class-428-339; US-Patent-Class-428-462; US-Patent-Class-428-466; US-Patent-Class-428-493) Avail: US Patent and Trademark Office CSCL 11I

Plasticized elastomer was securely bonded to a metal surface by interposing between the adhesive-coated metal surface and the elastomer sheet of material obtained by combining adhesive with a portion of the elastomer that was treated to remove plasticizers therefrom and heating the assembly in a mold under pressure. The sheet material is made up by dissolving a portion of the plasticized elastomer in an organic solvent, casting the solution, exposing it to a vacuum to remove the solvent and plasticizers, dissolving the deplasticized material in liquid adhesive and casting and drying the resulting liquid. Author

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N82-24344*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

HEAT SEALABLE, FLAME AND ABRASION RESISTANT COATED FABRIC Patent Application

Richard P. Tschirch (Little (Arthur D.), Inc., Cambridge, Mass.) and Kenneth R. Sidman, inventors (to NASA) (Little (Arthur D.), Inc., Cambridge, Mass.) Filed 6 Mar. 1981 17 p Sponsored by NASA
(NASA-Case-MSC-18382-2; US-Patent-Appl-SN-241155) HC A02/MF A01 CSCL 11E

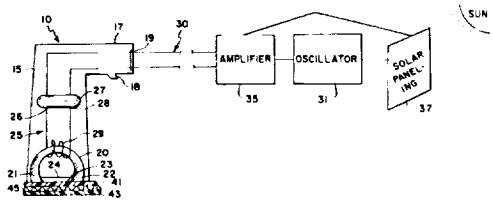
A flexible, lightweight, air impermeable coated fabric is discussed which has excellent resistance to flame and abrasion. Heat or dielectric sealing is used. The coating is thermoplastic polyurethane compounded with flame retardant fillers. NASA

N82-24345*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

INDUCTION HEATING GUN Patent Application

John D. Buckley and Robert J. Swaim, inventors (to NASA) Filed 22 Dec. 1981 14 p
(NASA-Case-LAR-12540-2; US-Patent-Appl-SN-333536) Avail: NTIS HC A02/MF A01 CSCL 11I

A device for inductively heating and fusing thermoplastics is discussed. It includes an alternating current passing through a tank circuit, the inductor member of the tank circuit being wrapped around a curved pole piece of a ferromagnetic material. The magnetic flux arising within the inductor coil member flows to the ends of the pole piece and into a screen placed between the materials to be joined. The flux induces a current in the screen, and heat is generated to melt the thermoplastics together. Because only 30 to 150 watts of power are passed through the tank circuit, a wire which will remain cool under operational wattage may be selected, making air or fluid cooling unnecessary. NASA



N82-25384*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ELASTOMER TOUGHENED POLYIMIDE ADHESIVES Patent Application

Anne K. St.Clair and Terry L. St.Clair, inventors (to NASA) Filed 2 Oct. 1981 14 p
(NASA-Case-LAR-12775-1; US-Patent-Appl-SN-308201) Avail: NTIS HC A02/MF A01 CSCL 07C

A rubber-toughened addition type polyimide composition having excellent high temperature bonding characteristics in the fully cured state and improved peel strength and adhesive fracture resistance is discussed. The process for making the improved adhesive involves preparing the rubber containing amic acid prepolymer by chemically reacting an amine-terminated elastomer and an aromatic diamine with an aromatic dianhydride with which a reactive chain stopper anhydride has been mixed, and utilizing a solvent or mixture of solvents for the reaction. NASA

N82-26460*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

HIGH TEMPERATURE EMITTANCE COATINGS AND COATING COMPOSITIONS Patent Application

Lunert J. Leger, Jerome F. Kuminecz, and D. Caston, inventors (to NASA) (Northrop Services, Inc., Houston, Tex.) Filed 26 Jan. 1982 9 p
(NASA-Case-MSC-18851-1; US-Patent-Appl-SN-342858) Avail: NTIS HC A02/MF A01 CSCL 11A

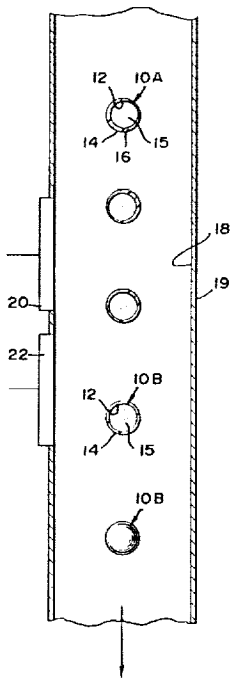
A composition consisting essentially of finely divided particles of silicon carbide dispersed in an alkyl alcohol and containing a minor amount of an emulaifiable polyethylene wax is used to deposit a coating of silicon particles on the surface of insulating articles in order to impact high temperature emittance to the surface. The coating can be applied under the ambient conditions of space to repair insulated surfaces of aerospace vehicles such as the tiles on space shuttle orbiters. NASA

N82-26461*# National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD AND APPARATUS FOR PRODUCING CONCENTRIC HOLLOW SPHERES Patent Application

Taylor G. Wang (JPL, California Inst. of Tech., Pasadena) and Daniel D. Elleman, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 18 Sep. 1981 14 p
(Contract NAS7-100)
(NASA-Case-NPO-14596-3; NASA-Case-NPO-14603-1; US-Patent-Appl-SN-303671) Avail: NTIS HC A02/MF A01 CSCL 11B

Hollow spheres with precisely concentric inner and outer spherical surfaces are formed by applying vibrations to a nonconcentric hollow sphere while it is at an elevated temperature at which it is fluid or plastic. The vibrations produce internal flows which cause the inner and outer surfaces to become precisely concentric. Concentric spheres can be mass produced by entruding a material such as glass or metal while injecting a stream of gas into the center of the extrusion to form a gas filled tube. Vibrations are applied to the extruded tube to help break it up into bodies tending to form spherical inner and outer surfaces by reason of surface tension, and the continuing application of vibrations causing these surfaces to become concentric. NASA



N82-26462*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
IMPROVED PROCESS FOR PREPARING PERFLUOROTRIAZINE ELASTOMERS AND PRECURSORS THEREOF Patent Application
Robert W. Rosser, Chung-Heng Cheng (San Jose State Univ.), and Timothy S. Chen, inventors (to NASA) (San Jose State Univ.) Filed 6 Apr. 1982 17 p
(NASA-Case-ARC-11402-1; US-Patent-Appl-SN-366025) Avail: NTIS HC A02/MF A01 CSCL 11I

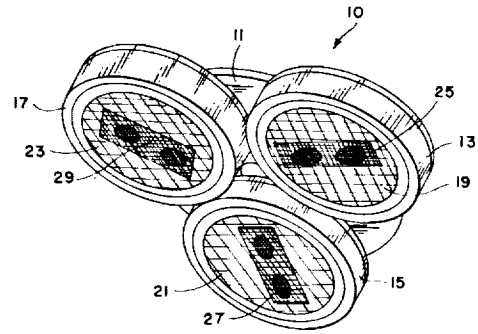
Perfluoroether triazine elastomers having improved properties are prepared from oligomeric imidoylamidines that were, in turn, prepared by the process of reacting a perfluorodinitrile with liquid ammonia to yield a perfluorodiamidine, isolating the perfluorodiamidine, reacting the isolated diamidine with a perfluorodinitrile to yield a perfluoro(imidoylamidine) dinitrile, and then repeating the steps to sequentially grow an oligomer of desired molecular size. The isolated amidine and nitrile intermediates are also disclosed. NASA

N82-26463*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
POLYPHENYLQUINOXALINES CONTAINING PENDANT PHENYLETHYNYL AND ETHYNYL GROUPS Patent Application
Paul M. Hergenrother, inventor (to NASA) (Virginia Polytechnic Inst. and State Univ.) Filed 12 Nov. 1981 24 p Sponsored by NASA
(NASA-Case-LAR-12838-1; US-Patent-Appl-SN-320621) Avail: NTIS HC A02/MF A01 CSCL 07G

A class of high temperature structural resins is obtained by utilizing ethynyl and phenylethynl groups as a means of ridigizing and crosslinking polymers. These polymers are synthesized from the reaction of aromatic bis(o-diamines) with aromatic bis(alpha-diketones) and aromatic bis(ethynylphenyl-alpha-diketones) or bis(phenylethynylpheny-alpha-diketones). The stoichiometry can be altered to control the amount of pendant ethynyl or phenylethynyl groups and, accordingly, the crosslinked density. As the amount of these groups is increased, the temperature necessary to induce the crosslinking reaction is lowered and the final use temperature of the polymer is raised. The resins obtained have elevated and stability use temperature capabilities. NASA

N82-26464*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HOT MELT RECHARGE SYSTEM Patent Application
Donald J. Progar, inventor (to NASA) Filed 24 Mar. 1982 12 p
(NASA-Case-LAR-12881-1; US-Patent-Appl-SN-361215) Avail: NTIS HC A02/MF A01 CSCL 11A

A package assembly for precisely positioning a charge of hot melt adhesive onto an attachment pad or point of use is described. The adhesive is heated to softening or melt temperature (280 F to 325 F) and thereafter cooled to resolidifying temperature. A single sided pressure sensitive polyimide film tape serves with another film strip to protect the sandwiched adhesive strip until use and to hold the adhesive in precise position until it is thermally bonded to its point of use. Tab ends serve as aids in stripping the tapes from the adhesive charge.
Official Gazette of the U.S. Patent and Trademark Office



N82-28440* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TEXTURING POLYMER SURFACES BY TRANSFER CASTING Patent
Bruce A. Banks, Albert J. Weigand, and James S. Sovey, inventors (to NASA) Issued 11 May 1982 4 p Filed 19 Dec. 1980 Supersedes N81-16327 (19 - 07, p 899)
(NASA-Case-LEW-13120-1; US-Patent-4,329,385; US-Patent-Appl-SN-218587; US-Patent-Class-428-141; US-Patent-Class-204-192E; US-Patent-Class-204-192EC; US-Patent-Class-264-22; US-Patent-Class-264-220) Avail: US Patent and Trademark Office CSCL 11G

A technique for fabricating textured surfaces on polymers without altering their surface chemistries is described. A surface of a fluorocarbon polymer is exposed to a beam of ions to texture it. The polymer which is to be surface-roughened is then cast over the textured surface of the fluorocarbon polymer. After curing, the cast polymer is peeled off the textured fluorocarbon polymer, and the peeled off surface has negative replica of the textured surface. The microscopic surface texture provides large

surface areas for adhesive bonding. In cardiovascular prosthesis applications the surfaces are relied on for the development of a thin adherent well nourished thrombus.

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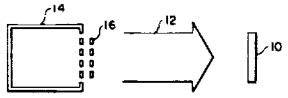

N82-28441* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

METHOD OF PROTECTING A SURFACE WITH A SILICON-SLURRY/ALUMINIDE COATING Patent

Daniel L. Deadmore and Stanley G. Young, inventors (to NASA) Issued 12 Jan. 1982 6 p. Filed 20 Jun. 1980 Supersedes N80-26389 (18 - 17, p. 2237)

(NASA-Case-LEW-13343-1; US-Patent-4,310,574; US-Patent-Appl-SN-161254; US-Patent-Class-427-405; US-Patent-Class-427-205; US-Patent-Class-427-253; US-Patent-Class-428-938; US-Patent-Class-428-941) Avail: US Patent and Trademark Office CSCL 11G

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

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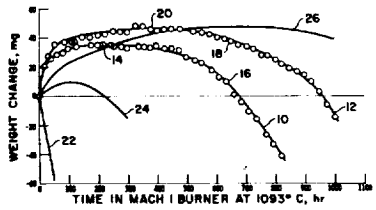

N82-28442* National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD OF FORMING FROZEN SPHERES IN A FORCE-FREE DROP TOWER Patent

James M. Kendall, Jr., inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 2 Feb. 1982 4 p. Filed 24 Dec. 1980 Supersedes N81-16328 (19 - 07, p. 0899) Sponsored by NASA

(NASA-Case-NPO-14845-1; US-Patent-4,313,745; US-Patent-Appl-SN-219680; US-Patent-Class-65-21.4; US-Patent-Class-65-22; US-Patent-Class-65-142; US-Patent-Class-264-5; US-Patent-Class-425-6) Avail: US Patent and Trademark Office CSCL 11B

Hollow glass spheres are shaped by the effects of surface tension acting on bubbles of glass in its molten state. A downwardly flowing stream of air accelerated at a one-G rate of acceleration is established through a drop bubbles on molten glass are introduced into the stream of air and frozen and as they are accelerated at a one-G rate of acceleration.

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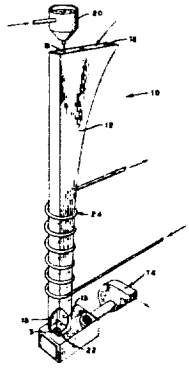


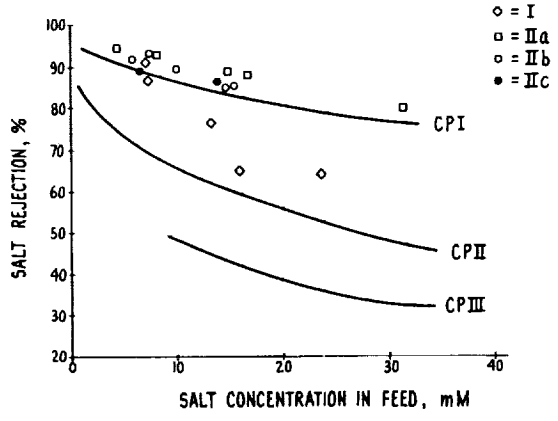
N82-28444*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

METHOD FOR THE PREPARATION OF THIN-SKINNED ASYMMETRIC REVERSE OSMOSIS MEMBRANES AND PRODUCTS THEREOF Patent Application

Theodore J. Wydeven and Moshe G. Katz, inventors (to NASA) Filed 25 Jun. 1982 14 p.

(NASA-Case-ARC-11359-1; US-Patent-Appl-SN-392092) Avail: NTIS HC A02/MF A01 CSCL 07C

A method for preparing water insoluble asymmetric membranes from water soluble polymers is discussed. The process involves casting a film of the polymer, momentarily partially drying it and then contacting it with a concentrated solution of a transition metal salt. The transition metal ions insolubilize the polymer and are believed to form a complex with it. Optionally, thereafter, the polymer is crosslinked with heat or radiation. The most preferred polymer is poly(vinyl alcohol). The most preferred complexing salt is copper sulfate. The process and the metal-ion linked membranes are discussed. The membranes are reverse osmosis membranes. NASA



N82-29451* National Aeronautics and Space Administration, Washington, D. C.
GLASS COMPOSITIONS WITH A HIGH MODULUS OF ELASTICITY
James F. Bacon, inventor (to NASA) (United Aircraft Corp., East Hartford, Conn.) 30 Mar. 1971 4 p Filed 16 Nov. 1967 Sponsored by NASA
(NASA-Case-HQN-10274-1; US-Patent-3,573,078; US-Patent-Appl-SN-683465; US-Patent-Class-106-52) Avail: US Patent and Trademark Office CSCL 11C

Glass compositions comprising silica, alumina, and magnesia plus substantial quantities of an uncommon oxide such as lanthana, ceria, and yttria provide a formulation containing no toxic elements and capable of fiberization to produce filaments having a high modulus of elasticity

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

N82-29452* National Aeronautics and Space Administration, Washington, D. C.
HIGH MODULUS INVERT ANALOG GLASS COMPOSITIONS CONTAINING BERYLLIA Patent
James F. Bacon, inventor (to NASA) (United Aircraft Corp., East Hartford, Conn.) Issued 15 Jan. 1974 6 p Filed 21 Apr. 1972 Continuation-in-part of abandoned US Patent Appl. SN-874674, filed 6 Nov. 1969 Sponsored by NASA
(NASA-Case-HQN-10931-2; US-Patent-3,785,836; US-Patent-Appl-SN-246295; US-Patent-Appl-SN-874674; US-Patent-Class-106-50; US-Patent-Class-106-52; US-Patent-Class-106-54) Avail: US Patent and Trademark Office CSCL 11C

Glass compositions having a Young's modulus of at least 15 million psi and a specific modulus of at least 110 million inches consisting essentially of, in mols, 10-45% SiO2, 2-15% Li2O, 3-34% BeO, 12-36% of at least one bivalent oxide selected from the group consisting of CaO, ZnO, MgO and CuO, 10-39% of at least one trivalent oxide selected from the group consisting of Al2O3, B2O3, La2O3, Y2O3 and the mixed rare earth oxides, the total number of said bivalent and trivalent oxides being at least three, and up to 10% of a tetravalent oxide selected from the group consisting of ZrO2, TiO2 and CeO2.

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N82-29453* National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.
FULLY PLASMA-SPRAYED COMPLIANT BACKED CERAMIC TURBINE SEAL Patent
Robert C. Bill and Donald W. Wisander, inventors (to NASA) Issued 22 Jun. 1982 4 p Filed 30 Mar. 1980 Supersedes N80-24619 (18 - 15, p 1985)
(NASA-Case-LEW-13268-1; US-Patent-4,336,276; US-Patent-Appl-SN-145209; US-Patent-Class-427-34; US-Patent-Class-415-174; US-Patent-Class-427-423) Avail: US Patent and Trademark Office CSCL 11A

A seal having a high temperature abradable lining material encircling the tips of turbine blades in turbomachinery is discussed. The minimum operating clearances between the blade tips and the lining of a high pressure turbine are maintained. A low temperature easily decomposable material, such as a polymer, in powder form is blended with a high temperature oxidation resistant metal powder. The two materials are simultaneously deposited on a substrate formed by the turbine casing. Alternately, the polymer powder may be added to the metal powder during plasma spraying. A ceramic layer is then deposited directly onto the metal polymer composite. The polymer additive mixed with the metal is then completely volatilized to provide a porous layer between the ceramic layer and the substrate.

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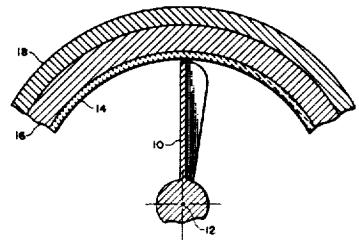

N82-29454* National Aeronautics and Space Administration, Washington, D. C.
NON-TOXIC INVERT ANALOG GLASS COMPOSITIONS OF HIGH MODULUS Patent
James F. Bacon, inventor (to NASA) (United Aircraft Corp., East Hartford, Conn.) Issued 21 May 1974 5 p Sponsored by NASA Continuation in part of abandoned US Patent Appl. SN-874673, filed 6 Nov. 1969
(NASA-Case-HQN-10328-2; US-Patent-3,811,901; US-Patent-Appl-SN-246294; US-Patent-Appl-SN-874673; US-Patent-Class-106-50; US-Patent-Class-106-52; US-Patent-Class-106-54) Avail: US Patent and Trademark Office CSCL 11C

Glass compositions having a Young's modulus of at least 15 million psi are described. They and a specific modulus of at least 110 million inches consist essentially of, in mols, 15 to 40% SiO2, 6 to 15% Li2O, 24 to 45% of at least two bivalent oxides selected from the group consisting of Ca, NzO, MgO and CuO, 13 to 39% of at least two trivalent oxides selected from the group consisting of Al2O3, Fe2O3, B2O3, La2O3, and Y2O3 and up to 15% of one or more tetravelent oxides selected from the group consisting of ZrO2, TiO2 and CeO2. The high modulus, low density glass compositions contain no toxic elements. The composition, glass density, Young's modulus, and specific modulus for 28 representative glasses are presented. The fiber modulus of five glasses are given.

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N82-29455* National Aeronautics and Space Administration, Washington, D. C.
HIGH MODULUS RARE EARTH AND BERYLLIUM CONTAINING SILICATE GLASS COMPOSITIONS Patent
James F. Bacon, inventor (to NASA) (United Technologies Corp., East Hartford, Conn.) Issued 30 Mar. 1976 5 p Filed 2 Jun. 1972 Sponsored by NASA Continuation in part of abandoned US Patent Appl. SN-874675, filed 6 Nov. 1969
(NASA-Case-HQN-10595-1; US-Patent-3,947,281; US-Patent-Appl-SN-259056; US-Patent-Appl-SN-874675; US-Patent-Class-106-52; US-Patent-Class-106-50) Avail: US Patent and Trademark Office CSCL 11B

Glass compositions having a Young's modulus of at least 16 million psi and a specific modulus of at least 110 million inches consisting essentially of approximately, by weight, 20 to 43% SiO2, 8 to 21% Al2O3, 4 to 10% BeO, 27 to 58% of at least one oxide selected from a first group consisting of Y2O3, La2O3, Nd2O3, Ce2O3, Ce2O3, and the mixed rare earth oxides, and 3 to 12% of at least one oxide selected from a second group consisting of MgO, ZrO2, ZnO and CaO are described. The molar ratio of BeO to the total content of the first group oxides is from 1.0 to 3.0.

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N82-29456* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
ATTACHMENT SYSTEM FOR SILICA TILES Patent
Robert L. Dotts (Rockwell International Corp., Downey, Calif.) and Jack W. Holt, inventors (to NASA) (Rockwell International Corp., Downey, Calif.) Issued 6 Jul. 1982 7 p Filed 17 Dec. 1980 Supersedes N81-16110 (19 - 07, p 0868) Sponsored by NASA
(NASA-Case-MSC-18741-1; US-Patent-4,338,368; US-Patent-Appl-SN-217336; US-Patent-Class-428-212; US-Patent-Class-156-329; US-Patent-Class-244-121; US-Patent-Class-244-158A; US-Patent-Class-244-160; US-Patent-Class-244-163; US-Patent-Class-428-49; US-Patent-Class-428-218; US-Patent-Class-428-283; US-Patent-Class-428-289; US-Patent-Class-428-307.7; US-Patent-Class-428-311.5; US-Patent-Class-428-312.6; US-Patent-Class-428-317.9; US-Patent-Class-428-325; US-Patent-Class-428-446) Avail: US Patent and Trademark Office CSCL 11A

An improved method for markedly increasing the bond strength between a rigid, porous refractory material and non-rigid substrate by densifying the face of the rigid material opposing the substrate is discussed. Densification is accomplished by wetting the refractory material and then impregnating it with a composite slurry having a particle size to fill voids of the porous material.

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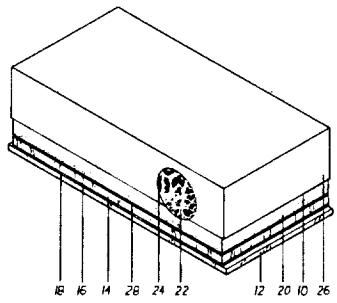

N82-32490*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
HIGH PERFORMANCE FILLETING SEALANT Patent Application
Robert W. Rosser, Danute I. Basiulis (Hughes Aircraft Co.), and Darrell P. Salisbury, inventors (to NASA) (Hughes Aircraft Co.) Filed 1 Jul. 1982 21 p
(NASA-Case-ARC-11409-1; US-Patent-Appl-SN-394345) Avail: NTIS HC A02/MF A01 CSCL 11A

A filleting sealant having high performance characteristics is disclosed. The sealant is based on NASA-patented cyano- and diamidoximine-terminated perfluoroalkylene ether prepolymers that are thermally condensed and cross-linked. The sealant contains asbestos and, in its preferred embodiments, carbon black reinforcement and a silicone or epoxy adhesion promoter. The sealant was extensively evaluated by Hughes Aircraft Company. In the evaluation it showed excellent resistance to fuel and other solvents and was much more resistant than Viton. It showed no corrosive effect on the surface of titanium in long term testing at 288 deg C (550 deg F) and had good adhesion to aluminum and titanium. No deterioration of adhesive strength resulting from elevated temperature fuel aging was noted. Lap shear and tensile strength surpassed MIL specification requirements. The tensile strength and elongation of the sealant indicate a lightly cross linked system with a Tg of -30 deg C. The thermal stability by thermogravimetric analysis is excellent with onset of degradation occurring at 280 deg C. NASA

N82-33520* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
METHOD FOR REPAIR OF THIN GLASS COATINGS Patent
Jack W. Holt (Rockwell International Corp., Downey, Calif.), Donald D. Helman (Rockwell International Corp., Downey, Calif.), and Laurence W. Smiser (Rockwell International Corp., Downey, Calif.) Issued 18 May 1982 6 p Filed 25 Jul. 1980 Supersedes N82-26369 (20 - 17, p 2367) Sponsored by NASA
(NASA-Case-KSC-11097-1; US-Patent-4,330,572; US-Patent-Appl-SN-172100; US-Patent-Class-427-140; US-Patent-Class-427-372.2; US-Patent-Class-427-397.7) Avail: US Patent and Trademark Office CSCL 11B

A method of repairing cracks or damaged areas in glass, in particular, glass coatings provided on tile. The method includes removing the damaged area using a high speed diamond burr drilling out a cavity that extends slightly into the base material of the tile. All loose material is then cleaned from the drilled out cavity and the cavity is filled adjacent the upper surface of the coating with a filler material including chopped silica fibers mixed with a binder. The filler material is packed into the cavity and a repair coating is applied by means of a brush or sprayed thereover. The repair includes borosilicate suspended in solution. Heat is applied at approximately 2100 F. for approximately five minutes for curing the coating, causing boron silicide particles of the coating to oxidize forming a very fluid boron-oxide rich glass which reacts with the other frits to form an impervious, highly refractory layer.

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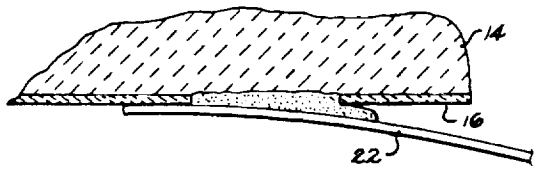

N82-33521* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SURFACE TEXTURING OF FLUOROPOLYMERS Patent
Bruce A. Banks, Michael J. Mirtich, and James S. Sovey, Inventors (to NASA) Issued 17 Aug. 1982 5 p Filed 19 Dec. 1980
(NASA-Case-LEW-13028-1; US-Patent-4,344,996; US-Patent-Appl-SN-218588; US-Patent-Class-428-141; US-Patent-Class-204-38B; US-Patent-Class-204-192E; US-Patent-Class-204-192EC) Avail: US Patent and Trademark Office CSCL 11G

A method is disclosed for improving surface texture for adhesive bonding, metal bonding, substrate plating, decal substrate preparation, and biomedical implant applications. The surface to be bonded is dusted in a controlled fashion to produce a disbursed layer of fine mesh particles which serve as masks. The surface texture is produced by impinging gas ions on the masked surface. The textured surface takes the form of pillars or cones. The bonding material, such as a liquid epoxy, flows between the pillars which results in a bond having increased strength. For bonding metals a thin film of metal is vapor or sputter deposited onto the textured surface. Electroplating or electroless plating is then used to increase the metal thickness in the desired amount.

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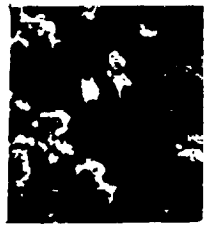
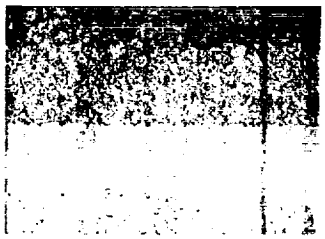


27 NONMETALLIC MATERIALS

N82-33522*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OVERLAY METALLIC-CERMET ALLOY COATING SYSTEMS Patent Application
Michael A. Gedwill, Stanley R. Levine, and Thomas K. Glasgow, inventors (to NASA) Filed 30 Jul. 1982 11 p
(NASA-Case-LEW-13639-1; US-Patent-Appl-SN-403378) Avail: NTIS HC A02/MF A01 CSCL 11G

A substrate, such as as a turbine blade, vane, or the like, which is subjected to high temperature use is coated with a base coating of an oxide dispersed, metallic alloy (cermet). A top coating of an oxidation, hot corrosion, erosion resistant alloy of nickel, cobalt, or iron is then deposited on the base coating. A heat treatment is used to improve the bonding. The base coating serves as an inhibitor to interdiffusion between the protective 10 top



N82-33523*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
HIGH PERFORMANCE CHANNEL INJECTION SEALANT INVENTION ABSTRACT Patent Application
Robert W. Rosser, Danute I. Basiulis (Hughes Aircraft Co.), and Darrell P. Salisbury, inventors (to NASA) (Hughes Aircraft Co.) Filed 30 Jul. 1982 21 p
(Contract NAS2-10334)
(NASA-Case-ARC-14408-1; US-Patent-Appl-SN-403371) Avail: NTIS HC A02/MF A01 CSCL 11A

High performance channel sealant is based on NASA patented cyano and diamidoximine-terminated perfluoroalkylene ether prepolymers that are thermally condensed and cross linked. The sealant contains asbestos and, in its preferred embodiments, Lithofrax, to lower its thermal expansion coefficient and a phenolic metal deactivator. Extensive evaluation shows the sealant is extremely resistant to thermal degradation with an onset point of 280 C. The materials have a volatile content of 0.18%, excellent flexibility, and adherence properties, and fuel resistance. No corrosibility to aluminum or titanium was observed. NASA

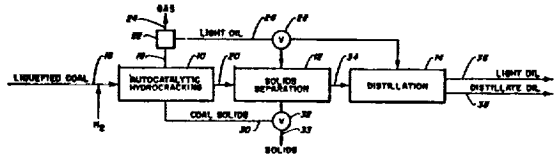
28 PROPELLANTS AND FUELS

Includes rocket propellants, igniters, and oxidizers, storage and handling; and aircraft fuels.

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

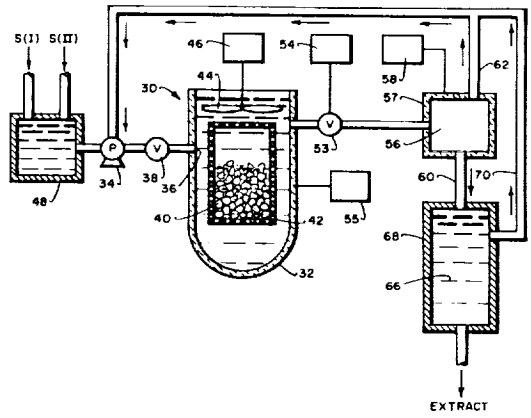
N82-25394*# National Aeronautics and Space Administration. Pasadena Office, Calif.
AUTOCATALYTIC COAL LIQUEFACTION PROCESS Patent Application
Shaik A. Qader, Principal Investigator (JPL, California Inst. of Technology, Pasadena) Filed 3 Jan. 1980 32 p Sponsored by NASA
(NASA-Case-NPO-14876-2; US-Patent-Appl-SN-285194) Avail: NTIS HC A03/MF A01 CSCL 21D

An improved process for liquefying coal in which coal minerals at high content are utilized as hydrocracking catalysts is described. A slurry of 10 to 60% by weight of coal in a recycled liquefied coal product containing 15 to 30% by weight of coal minerals is pressurized with excess hydrogen to a pressure of 2,000 to 4,000 psi and heated to a temperature of 450 to 550 degrees C. The coal minerals autocatalytically convert coal solids to a low viscosity liquid product and to a gas product in high yields while reducing oxygen, nitrogen, and sulfur content of the coal product as compared to other coal liquefaction processes under development. NASA



N82-26481*# National Aeronautics and Space Administration. Pasadena Office, Calif.
SUPERCRITICAL SOLVENT COAL EXTRACTION Patent Application
Leslie E. Compton, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 17 Nov. 1981 18 p
(Contract NAS7-100)
(NASA-Case-NPO-15210-1; US-Patent-Appl-SN-322312) Avail: NTIS HC A02/MF A01 CSCL 21D

Yields of soluble organic extract are increased up to about 50% by the supercritical extraction of particulate coal at a temperature below the polymerization temperature for coal extract fragments (450 C) and a pressure from 500 psig to 5,000 psig by the conjoint use of a solvent mixture containing a low volatility, high critical temperature coal dissolution catalyst such as phenanthrene and a high volatility, low critical temperature solvent such as toluene. NASA



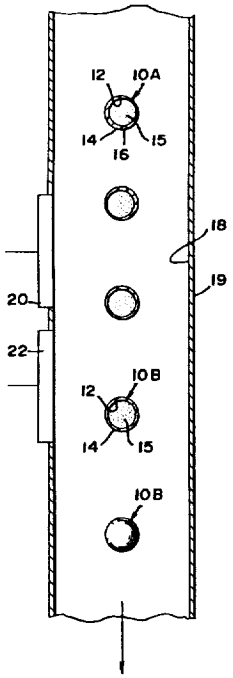
31 ENGINEERING (GENERAL)

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

N82-25401*# National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD AND APPARATUS FOR PRODUCING CONCENTRIC HOLLOW SPHERES Patent Application

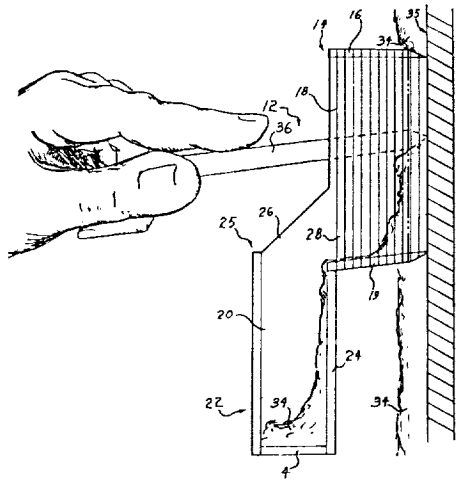
Taylor G. Wang (JPL, California Inst. of Tech., Pasadena) and Daniel D. Elleman, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 17 Jul. 1981 15 p
(Contract NAS7-100)
(NASA-Case-NPO-14596-2; NASA-Case-NPO-14603-4; US-Patent-Appl-SN-284313) Avail: NTIS HC A02/MF A01 CSCL 13H

Hollow spheres with precisely concentric inner and outer spherical surfaces are formed by applying vibrations to a nonconcentric hollow sphere while it is at an elevated temperature at which it is fluid or plastic, the vibrations producing internal flos which cause the inner and outer surfaces to become precisely concentric. Concentric spheres can be mass produced by extruding a material such as glass or metal while injecting a stream of gas into the center of the extrusion to form a gas filled tube. Vibration are applied to the extruded tube to help break to form spherical inner and outer surfaces by reason of surface tension, and the continuing application of vibrations causing these surfaces to become concentric. NASA



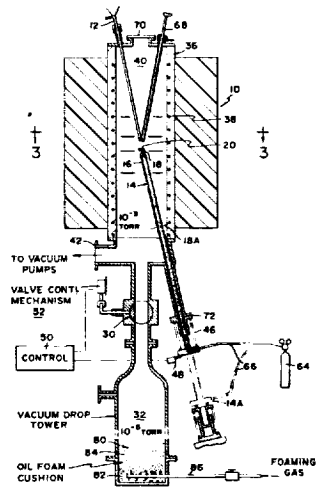
N82-26503*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DEVICE FOR DETERMINING FROST DEPTH AND DENSITY Patent Application
Farouk Hunedi, inventor (to NASA) Filed 18 Mar. 1982 11 p
(NASA-Case-MFS-25754-1; US-Patent-Appl-SN-359626) Avail: NTIS HC A02/MF A01 CSCL 20L

A hand held device having a forward open window portion adapted to be pushed downwardly into the frost on a surface, and a rear container portion adapted to receive the frost removed from the window area are described. A graph on a side of the container enables an observer to determine the density of the frost from certain measurements noted. The depth of the frost is noted from calibrated lines on the sides of the open window portion. NASA



N82-33567*# National Aeronautics and Space Administration. Pasadena Office, Calif.
SPHERE FORMING METHOD AND APPARATUS Patent Application
Charles L. Youngberg (JPL, California Inst. of Tech., Pasadena), Charles G. Miller (JPL, California Inst. of Tech., Pasadena), James B. Stephens (JPL, California Inst. of Tech., Pasadena), and Anthony A. Finnerty, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 30 Jul. 1982 16 p
(Contract NAS7-100)
(NASA-Case-NPO-15070-1; US-Patent-Appl-SN-403847) Avail: NTIS HC A02/MF A01 CSCL 13H

Hollow bodies are formed into accurate spheres. A hollow body is dropped through a tube to fall to a position where it is supported on an updraft of hot air issuing from the end of a levitator. The hot air and heat from over walls allow surface tension to spherically form the object. The molten sphere is allowed to fall, by jerking the levitator at a downward incline. The molten sphere falls through a valve and into a drop tower, to cool as it falls. The drop tower contains a vacuum, to avoid distorting the falling sphere. The valve opens for only a brief time (e.g., 1/10th second) to admit the sphere, and then closes, to minimize the inflow of air. At the bottom of the drop tower, an oil bath into which gas has been blown to form a foam is at the bottom of the deep tower. The foam cushions the fall of the sphere. NASA



32 COMMUNICATIONS

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

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

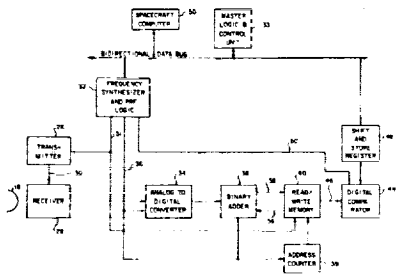
N82-23376* National Aeronautics and Space Administration. Pasadena Office, Calif.

ECHO TRACKER/RANGE FINDER FOR RADARS AND SONARS Patent

Nick J. Constantinides, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 16 Mar. 1982 10 p Filed 29 Jun. 1979 Supersedes N79-26253 (17 - 17, p 2249)
(NASA-Case-NPO-14361-1; US-Patent-4,320,397; US-Patent-Appl-SN-053572; US-Patent-Class-343-7.5; US-Patent-Class-343-5DP; US-Patent-Class-343-17.1PF; US-Patent-Class-356-5; US-Patent-Class-367-95) Avail: US Patent and Trademark Office CSCL 20N

An echo tracker/range finder or altimeter is described. The pulse repetition frequency (PFR) of a predetermined plurality of transmitted pulses is adjusted so that echo pulses received from a reflecting object are positioned between transmitted pulses and divided their interpulse time interval into two time intervals having a predetermined ratio with respect to each other. The invention described provides a means whereby the arrival time of a plurality of echo pulses is defined as the time at which a composite echo pulse formed of a sum of the individual echo pulses has the highest amplitude. The invention is applicable to radar systems, sonar systems, or any other kind of system in which pulses are transmitted and echoes received therefrom.

M.D.K.



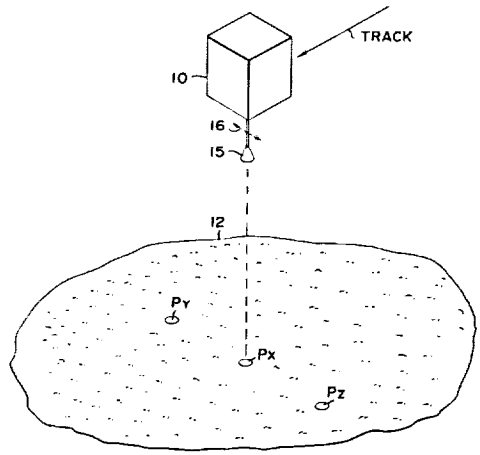
N82-26523*# National Aeronautics and Space Administration. Pasadena Office, Calif.

WIDEBAND PASSIVE SYNTHETIC-APERTURE MULTICHANNEL RECEIVER Patent Application

Joseph M. Stacey, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 5 May 1982 26 p
(Contract NAS7-100)
(NASA-Case-NPO-15651-1; US-Patent-Appl-SN-375620) Avail: NTIS HC A03/MF A01 CSCL 17B

The receiver is in a satellite which makes repeated sweeps over the oceans. As it travels along its track, an antenna is swept back and forth at a selected swath width. From each incremental area (pixel) of the ocean surface, Px-Pz signals are received as a function of the sea temperature. The receiver includes a plurality of channels each tuned to a different frequency. The outputs of the channels are fed to a processor of the receiver and stored. A formula is generated for use in determining the sea temperature at each pixel, remote from the calibration areas. The receiver can be used to measure air temperature, air pressure and wind direction at each pixel.

T.M.



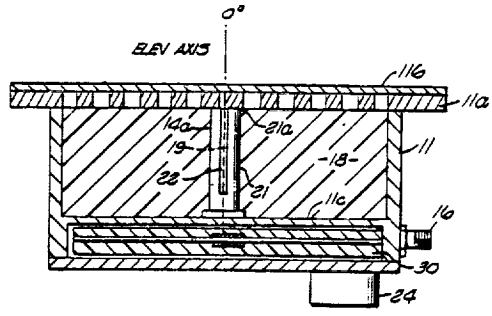
N82-27558* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

SPIRAL SLOTTED PHASED ANTENNA ARRAY Patent

Haynes Ellis, Jr., inventor (to NASA) (Rockwell International Corp., Downey, Calif.) Issued 9 Feb. 1982 7 p Filed 25 Jul. 1980 Supersedes N80-29543 (18 - 20, p 2685) Sponsored by NASA
(NASA-Case-MSC-18532-1; US-Patent-4,315,266; US-Patent-Appl-SN-172099; US-Patent-Class-343-895; US-Patent-Class-343-789) Avail: US Patent and Trademark Office CSCL 20N

A flush mounting, cavity-backed, dual orthogonal slot antenna for aircraft and space vehicles is described. Improved radiation pattern characteristics are obtained by making the spiral slot pattern elliptical in the aperture plane. A cavity and a flanged aperture plate are configured such that one slot pair is orthogonal with respect to another slot pair within the aperture plate. Coaxial split-tube baluns are used to drive the junctions between corresponding slot pairs. An optional cavity dielectric is provided and a drive coupling arrangement includes a four port comparator hybrid having sum and difference ports respectively, for alternate excitation to produce a single lobe or a double lobe pattern with null. Switching apparatus is provided to connect a common terminal to either of the ports.

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



N82-28502*# National Aeronautics and Space Administration. Pasadena Office, Calif.

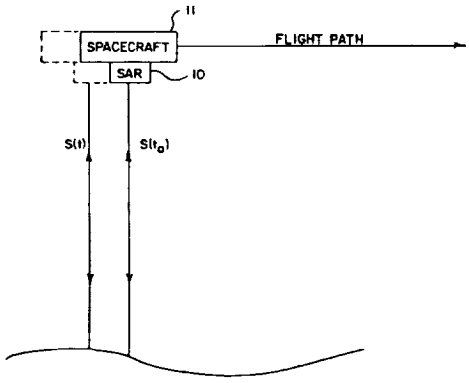
METHOD AND APPARATUS FOR DELTA K SYNTHETIC APERATURE RADAR MEASUREMENT OF OCEAN CURRENT Patent Application

Atul Jain, inventor (to NASA) (JPL) Filed 18 Mar. 1982 11 p

(Contract NAS7-100)

(NASA-Case-NPO-15704-1; US-Patent-Appl-SN-359382) Avail: NTIS HC A02/MF A01 CSCL 17I

A synthetic aperture radar is employed for delta k measurement of ocean current from a spacecraft without the need for a narrow beam and long observation times. The SAR signal is compressed to provide image data for different sections of the chirp bandwidth, equivalent to frequencies f sub 1 (ta,t), f sub 2 (ta,t), f sub n (ta,t), and a common area for the separate image fields is selected. The image for the selected area at each frequency is deconvolved to obtain the image signals for the different frequencies (f sub 1, f sub 2, f sub m) and the same area. A product of pairs of signals is formed, Fourier transformed and squared. The spectrum thus obtained for different areas for the same pair of frequencies f sub jk, f sub j + n,k are added to provide an improved signal to noise ratio. The shift of the peak from the center of the spectrum is measured and compared to the expected shift due to the phase velocity of the Bragg scattering wave. Any difference is a measure of current velocity v sub c. NASA



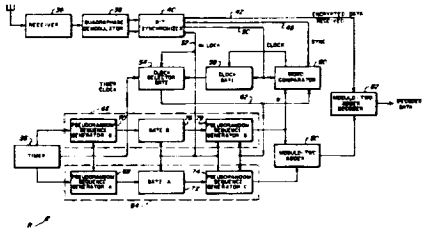
N82-31583* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

RANDOM DIGITAL ENCRYPTION SECURE COMMUNICATION SYSTEM Patent

George D. Doland, inventor (to NASA) (Lockheed Electronics Co., Houston, Tex.) Issued 27 Jul. 1982 8 p Filed 28 Apr. 1978 Supersedes N78-25274 (16 - 16, 2101) Sponsored by NASA

(NASA-Case-MSC-16462-1; US-Patent-4,341,925; US-Patent-Appl-SN-900841; US-Patent-Class-178-22.17; US-Patent-Class-178-22.16; US-Patent-Class-375-106; US-Patent-Class-364-717) Avail: US Patent and Trademark Office CSCL 17B

The design of a secure communication system is described. A product code, formed from two pseudorandom sequences of digital bits, is used to encipher or scramble data prior to transmission. The two pseudorandom sequences are periodically changed at intervals before they have had time to repeat. One of the two sequences is transmitted continuously with the scrambled data for synchronization. In the receiver portion of the system, the incoming signal is compared with one of two locally generated pseudorandom sequences until correspondence between the sequences is obtained. At this time, the two locally generated sequences are formed into a product code which deciphers the data from the incoming signal. Provision is made to ensure synchronization of the transmitting and receiving portions of the system. Official Gazette of the U.S. Patent and Trademark Office



N82-33593*# National Aeronautics and Space Administration. Pasadena Office, Calif.

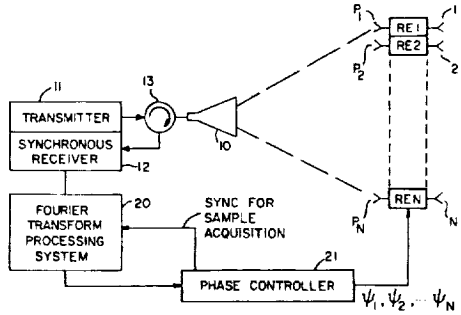
METHOD AND APPARATUS FOR SELF-CALIBRATION AND PHASING OF ARRAY ANTENNA Patent Application

Chialin Wu, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 30 Jul. 1982 22 p

(Contract NAS7-100)

(NASA-Case-NPO-15920-1; US-Patent-Appl-SN-403848) Avail: NTIS HC A02/MF A01 CSCL 09C

A central feed broadcasts a continuous and coherent wave from a transmitter to array elements through radiation electronics. Return electromagnetic wave energy is received from each element by a synchronous receiver through a circulator, either by leakage of energy from a power amplifier through a circulator to a receiver amplifier coupled to a reciprocal phase shifter by a directional coupler in one mode, or from a short circuit switch in another mode. The phase shifters are assumed to be set for a precomputed array pattern for a predetermined array structure. A phase controller advances the phase angles for the phase shifters at different rates in order to introduce a distinct frequency modulation of the returned energy for each array element. The composite return energy is coherently demodulated by a Fourier transform processing system, the output of which corresponds to the response of the array elements. The phase compensation required for each antenna element to achieve the precomputed array pattern is then derived from its response by the phase controller. NASA



33 ELECTRONICS AND ELECTRICAL ENGINEERING

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

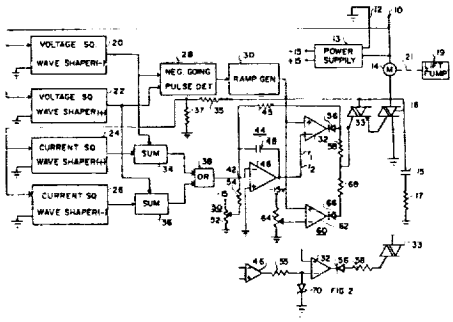
For related information see also *60 Computer Operations and Hardware* and *76 Solid-State Physics*.

N82-22437*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

CONTROL SYSTEM FOR AN INDUCTION MOTOR WITH ENERGY RECOVERY Patent Application

Frank J. Nola, inventor (to NASA) Filed 19 Feb. 1982 22 p (NASA-Case-MFS-25477-1; US-Patent-Appl-SN-350472) Avail: NTIS HC A02/MF A01 CSCL 09A

A control circuit for an induction motor powered system is described wherein a power factor controlled servo loop is used to control, via the phase angle of firing of a triac, the power input to the motor as a function of load placed on the motor by machinery of the powered system. Upon application of torque by this machinery to the motor, which tends to overspeed the motor, the firing angle of the triac is automatically set to a fixed, and relatively short, firing angle. NASA



N82-23396*# National Aeronautics and Space Administration. Pasadena Office, Calif.

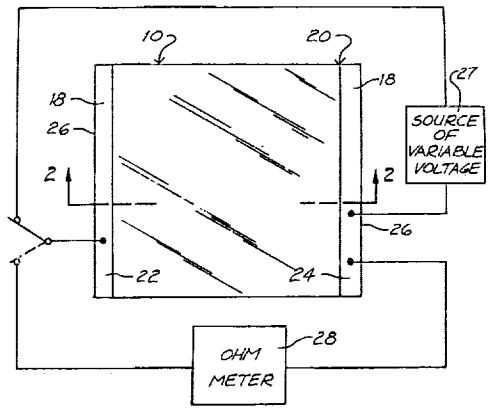
GLASS HEATING PANELS AND METHOD FOR PREPARING THE SAME FROM ARCHITECTURAL REFLECTIVE GLASS Patent Application

Paul J. Shlichta (JPL, California Inst. of Tech., Pasadena) and Bruce A. Nerad, inventors to NASA (JPL, California Inst. of Tech., Pasadena) Filed 26 Jan. 1982 26 p

(Contract NAS7-100)

(NASA-Case-NPO-15753-1; US-Patent-Appl-SN-342871) Avail: NTIS HC A03/MF A01 CSCL 09C

A method for producing glass supported resistive heating elements is described. Electrodes are positioned in intimate contact with an outer surface of a thin electrically insulating protecting layer of architectural reflective glass. Application of a voltage of sufficient magnitude substantially destroys the insulating layer located beneath the electrodes. A subsequent application of voltage results in a passage of current through the underlying thin, light-reflective metal or metal oxide layer and in concomitant output of heat. In addition techniques are suggested for producing panels wherein the electrically heated area is readily preselected in any desired configuration. NASA



N82-24415* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

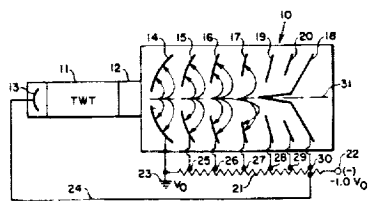
MULTISTAGE DEPRESSED COLLECTOR FOR DUAL MODE OPERATION Patent

Henry C. Kosmahl, inventor (to NASA) Issued 7 Jul. 1981 6 p Filed 7 Sep. 1979 Supersedes N79-32463 (17 - 23, p 3080)

(NASA-Case-LEW-13282-1; US-Patent-4,277,721; US-Patent-Appl-SN-073579; US-Patent-Class-315-5.38; US-Patent-Class-315-3.6) Avail: US Patent and Trademark Office CSCL 09A

A depressed collector which captures the spent electrons of a microwave transmitting tube at high efficiency in both high and low power modes of operation is described. The collector comprises entrance and end electrodes, the end electrode having a spike extending toward entrance electrode. Intermediate electrodes and the entrance electrode each have a central aperture and, together, these electrodes capture most high power mode spent electrons. The apertures of the electrodes increase in size in a downstream direction. To capture low power mode spent electrons a low power mode electrode is positioned between the last intermediate electrode and the end electrode. This electrode has a central aperture preferably smaller but no larger than that of the last intermediate electrode. An auxiliary low power mode electrode may be added having a central aperture larger than that of the low power mode electrode. All of the electrodes are at voltages provided by a voltage divider connected between a potential.

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



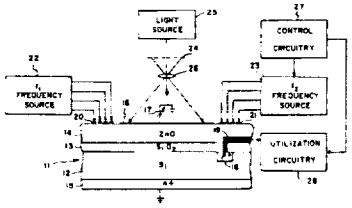
N82-24416* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

IMAGE READOUT DEVICE WITH ELECTRONICALLY VARIABLE SPATIAL RESOLUTION Patent

Harry A. Benz, inventor (to NASA) Issued 14 Jul. 1981 5 p Filed 28 Mar. 1980 Supersedes N80-22661 (18 - 13, p 1714)

(NASA-Case-LAR-12633-1; US-Patent-4,279,001; US-Patent-Appl-SN-135039; US-Patent-Class-358-213) Avail: US Patent and Trademark Office CSCL 09A

An invention relating to the use of a standing acoustic wave charge storage device as an image readout device is described. A frequency f sub 1 was applied to the storage transfer device to create a traveling electric field in the device in one direction along a straight line. A second frequency f sub 2 was applied to the charge transfer device to create a traveling electric field opposite to the first traveling electric field. A standing wave was created. When an image was focused on the charge transfer device, light was stored in the wells of the standing wave. When the frequency f sub 2 is removed from the device, the standing wave tends to break up and the charges stored move to an electrode connected to an output terminal and to a utilization device where the received charges represent the image on the surface of the charge transfer device along a projection of said straight line. M.D.K.



N82-24417* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

SMOOTHING FILTER FOR DIGITAL TO ANALOG CONVERSION Patent

Charles A. Wagner, inventor (to NASA) 23 Jun. 1981 6 p Filed 25 Jan. 1980 Supersedes N80-17723 (18 - 08, p 1048)

(NASA-Case-FRC-11025-1; US-Patent-4,275,453; US-Patent-Appl-SN-115536; US-Patent-Class-364-825; US-Patent-Class-330-109; US-Patent-Class-330-290; US-Patent-Class-330-294; US-Patent-Class-330-306; US-Patent-Class-328-167) Avail: US Patent and Trademark Office CSCL 09A

An electronic filter comprised of three active filter sections to smooth the stepped signal from a digital to analog converter is described. The first section has a noninverting low pass filter transfer function, and the second has an inverting transfer function designed to pass a narrow frequency band centered at the step frequency of the stepped output signal with sharp cutoff of either side of that narrow band. The third section adds the noninverted output of the first section to the inverted output of the second section. This third section has a lead-lag transfer function designed to reduce the phase angle between the signal at its output terminal and the stepped signal at the input of the first section.

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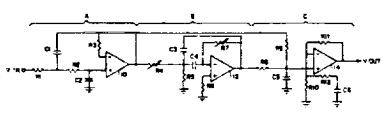

N82-24418* National Aeronautics and Space Administration. Pasadena Office, Calif.

PULSE SWITCHING FOR HIGH ENERGY LASERS Patent

James B. Laudenslager (JPL, California Inst. of Tech., Pasadena) and Thomas J. Pacala, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 23 Jun. 1981 9 p Filed 23 Mar. 1979 Supersedes N79-21336 (17 - 12, p 1561) Sponsored by NASA

(NASA-Case-NPO-14556-1; US-Patent-4,275,317; US-Patent-Appl-SN-023485; US-Patent-Class-307-415; US-Patent-Class-328-67; US-Patent-Class-331-94.5G; US-Patent-Class-331-94.5P; US-Patent-Class-333-20) Avail: US Patent and Trademark Office CSCL 09C

A saturable inductor switch for compressing the width and sharpening the rise time of high voltage pulses from a relatively slow rise time, high voltage generator to an electric discharge gas laser (EDGL) also provides a capability for efficient energy transfer from a high impedance primary source to an intermediate low impedance laser discharge network. The switch is positioned with respect to a capacitive storage device, such as a coaxial cable, so that when a charge build-up in the storage device reaches a predetermined level, saturation of the switch inductor releases or switches energy stored in the capactive storage device to the EDGL. Cascaded saturable inductor switches for providing output pulses having rise times of less than ten nanoseconds and a technique for magnetically biasing the saturable inductor switch are disclosed.

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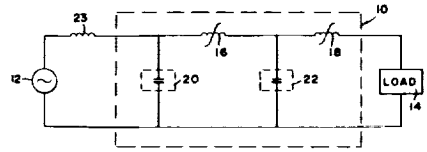

N82-24419* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

AUTOMATIC THERMAL SWITCH Patent

Lawrence D. Wing and Joseph W. Cunningham, inventors (to NASA) Issued 8 Apr. 1981 9 p Filed 30 May 1979 Supersedes N80-18338 (18 - 09, p 1136)

(NASA-Case-GSC-12415-1; US-Patent-4,281,708; US-Patent-Appl-SN-043943; US-Patent-Class-165-32; US-Patent-Class-62-383) Avail: US Patent and Trademark Office CSCL 09C

An automatic thermal switch to control heat flow includes a first thermally conductive plate, a second thermally conductive plate and a thermal transfer plate pivotally mounted between the first and second plates. A phase change power unit, including a plunger connected to the transfer plate, is in thermal contact with the first thermally conductive plate. A biasing element, connected to the transfer plate, biases the transfer plate in a predetermined position with respect to the first and second plates. When the phase change power unit is actuated by an increase in heat transmitted through the first plate, the plunger extends and pivots the transfer plate to vary the thermal conduction between the first and second plates through the transfer plate. The biasing element, transfer plate and piston can be arranged to provide either a normally closed or normally open thermally conductive path between the first and second plates.

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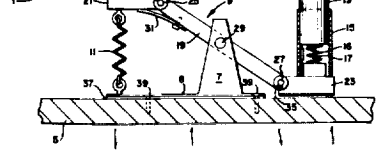

N82-24420* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

TEST APPARATUS FOR LOCATING SHORTS DURING ASSEMBLY OF ELECTRICAL BUSES Patent

Gordon J. Deboo and David L. Devine, inventors (to NASA) Issued 8 Apr. 1981 5 p Filed 24 Aug. 1979 Supersedes N79-31498 (17 - 22, p 2946)
(NASA-Case-ARC-11116-1; US-Patent-4,262,479; US-Patent-Appl-SN-069485; US-Patent-Class-324-51; US-Patent-Class-324-52) Avail: US Patent and Trademark Office CSCL 09C

A test apparatus is described for locating electrical shorts that is especially suited for use while an electrical circuit is being fabricated or assembled. A ring counter derives input pulses from a square wave oscillator. The outputs of the counter are fed through transistors to an array of light emitting diodes. Each diode is connected to an electrical conductor, such as a bus bar, that is to be tested. In the absence of a short between the electrical conductors the diodes are sequentially illuminated. When a short occurs, a comparator/multivibrator circuit triggers an alarm and stops the oscillator and the sequential energization of the diodes. The two diodes that remain illuminated identify the electrical conductors that are shorted.

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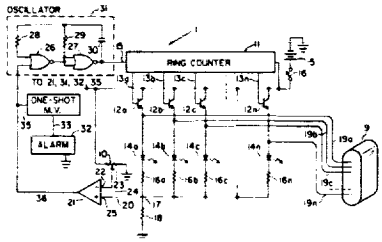

N82-24421* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

LINEAR MAGNETIC MOTOR/GENERATOR Patent

Philip A. Studer, inventor (to NASA) Issued 9 Feb. 1982 13 p Filed 7 Feb. 1980 Supersedes N80-19424 (18 - 10, p 1287)
(NASA-Case-GSC-12518-1; US-Patent-4,315,197; US-Patent-Appl-SN-119336; US-Patent-Class-318-135; US-Patent-Class-335-229; US-Patent-Class-335-266; US-Patent-Class-310-12) Avail: US Patent and Trademark Office CSCL 09A

A linear magnetic motor/generator is disclosed which uses magnetic flux to provide mechanical motion or electrical energy. The linear magnetic motor/generator includes an axially movable actuator mechanism. A permament magnet mechanism defines a first magnetic flux path which passes through a first end portion of the actuator mechanism. Another permament magnet mechanism defines a second magnetic flux path which passes through a second end portion of the actuator mechanism. A drive coil defines a third magnetic flux path passing through a third central portion of the actuator mechanism. A drive coil selectively adds magnetic flux to and subtracts magnetic flux from magnetic flux flowing in the first and second magnetic flux path.

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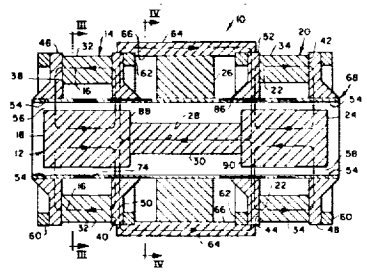
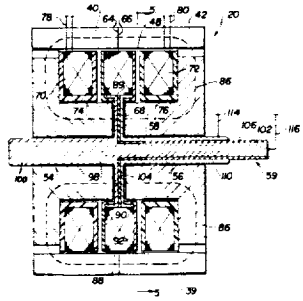


N82-24422* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

NON-CONTACTING POWER TRANSFER DEVICE Patent

Philip A. Studer and John Paulkovich, inventors (to NASA) Issued 23 Mar. 1982 7 p Filed 13 Nov. 1980 Supersedes N81-12331 (19 - 03, p 0338)
(NASA-Case-GSC-12595-1; US-Patent-4,321,572; US-Patent-Appl-SN-206506; US-Patent-Class-336-83; US-Patent-Class-336-120) Avail: US Patent and Trademark Office CSCL 09A

A transformer for coupling AC electrical energy from a stationary element to a rotating element without the use of sliding contacts is described. The transformer is of the rotary type and includes a ferrite core and two primary windings which are stationary with respect to a seconary winding which rotates within an annular cavity adjacent an axial bore in the core. The core is comprised of two cup type core halves. Electrical connection to the secondary winding is made through a split bobbin assembly which couples to a coaxial shaft assembly located in the axial bore. The electrical coupling to the coaxial shaft assembly is made through a continuous transverse channel connecting the axial bore with the annular cavity. The transverse channel forms a single air gap; however, it is not open directly to free space but is shielded by the magnetic permeable material of the core halves. Official Gazette of U.S. Patent and Trademark Office

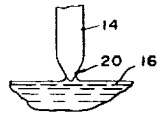


N82-24426*# National Aeronautics and Space Administration. Pasadena Office, Calif.

THIN WIRE POINTING METHOD Patent Application

Gordon Green (JPL, California Inst. of Tech., Pasadena) and Robert J. Mattauch, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 17 Nov. 1981 10 p
(Contract NAS7-100)
(NASA-Case-NPO-15789-1; US-Patent-Appl-SN-322316) Avail: NTIS HC A02/MF A01 CSCL 09A

A method is described for forming sharp tips on thin wires, in particular phosphor bronze wires of diameters such as one thousandth inch used to contact micron size Schottky barrier diodes, which enables close control of tip shape and which avoids the use of highly toxic solutions. The method includes dipping and end of a phosphor bronze wire into a dilute solution of sulfamic acid and applying a current through the wire to electrochemically etch it. The humidity in the room is controlled to a level of less than 50%, and the voltage applied between the wire and another electrode in the solution is a half wave rectified voltage. The current through the wire is monitored, and the process is stopped when the current falls to a predetermined low level. NASA



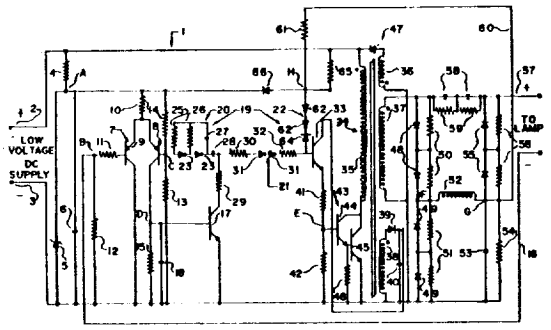
N82-24427*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

DIRECT CURRENT BALLAST CIRCUIT FOR METAL HALIDE LAMP Patent Application

Paul Lutus, inventor (to ILC Technology, Inc., Sunnyvale,

Calif.) Filed 14 Sep. 1981 14 p Sponsored by NASA
(NASA-Case-MSC-18407-1; US-Patent-Appl-SN-293419) Avail: NTIS HC A02/MF A01 CSCL 09A

A direct current ballast circuit for a two electrode metal halide lamp is described. Said direct current ballast circuit includes a low voltage DC input and a high frequency power amplifier and power transformer for developing a high voltage output. The output voltage is rectified by diodes and filterd by inductor and capacitor to provide a regulated DC output through commutating diodes to one terminal of the lamp at the output terminal. A feedback path from the output of the filter capacitor through the bias resistor to power the high frequency circuit which includes the power amplifier and the power transformer for sustaining circuit operations during low voltage transients on the input DC supply is described. A current sensor connected to the output of the lamp through terminal for stabilizing lamp current following breakdown of the lamp is described. NASA

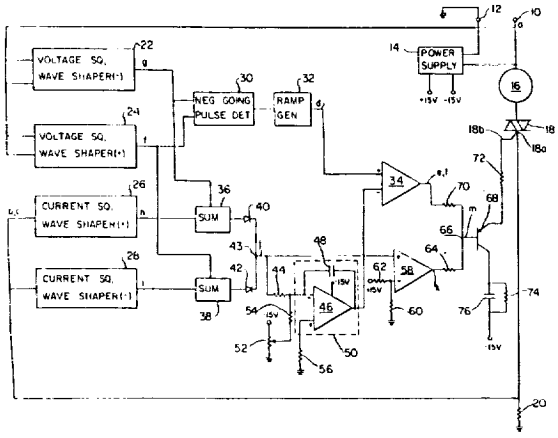


N82-24428*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

PULSED THYRISTOR TRIGGER CONTROL CIRCUIT Patent Application

Frank J. Nola, Inventor (to NASA) Filed 30 Nov. 1981 15 p
(NASA-Case-MFS-25616-1; US-Patent-Appl-SN-325932) Avail: NTIS HC A02/MF A01 CSCL 09C

A trigger control circuit for producing firing pulses for the thyristor of a thyristor control system such as a power factor controller is described. The control circuit overcomes thyristor triggering problems involved with the current lag associated with controlling inductive loads. A phase difference signal is utilized in deriving a signal for inhibiting generation of a firing pulse until no current is flowing from the preceeding half cycle. NASA

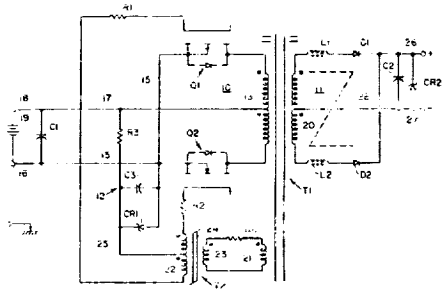


N82-24432*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SIMPLIFIED dc TO dc CONVERTER Patent Application

Robert P. Gruber, inventor (to NASA) Filed 14 Apr. 1982 17 p
(NASA-Case-LEW-13495-1; US-Patent-Appl-SN-368188) Avail: NTIS HC A02/MF A01 CSCL 09A

A dc to dc converter is disclosed which has a minimum number of components, output voltage regulation, and output current limiting without any circuits converting the output to any other circuits of the converter. The converter is comprised of a transformer having a primary winding through which current is directed in alternate directions by metal oxide semiconductor transistors connected between the primary winding and a dc source or battery. A secondary winding of the transformer is connected to a rectifying and filter circuit to provide unidirectional output current. Both windings of the transformer are carried on the respective outer legs of an E-core with the center leg of the core proving a leakage reactance. This leakage reactance has the same effect as placing an inductor in series with the rectifiers in output circuit. NASA

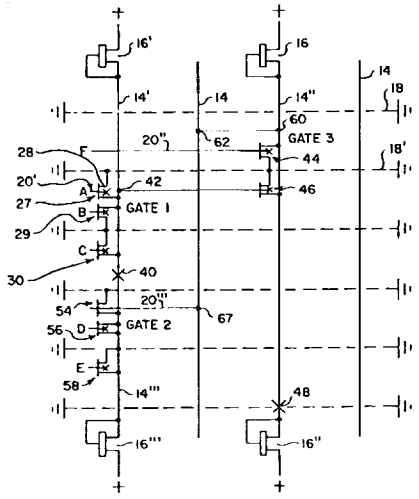


N82-25440*# National Aeronautics and Space Administration. Pasadena Office, Calif.

GENERAL LOGIC STRUCTURE FOR CUSTOM LSI CIRCUITS Patent Application

Michael W. Sievers, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 12 Jun. 1981 28 p
(Contract NAS7-100)
(NASA-Case-NPO-14410-2; US-Patent-Appl-SN-272838) Avail: NTIS HC A03/MF A01 CSCL 09C

A general logic structure (GLS) for custom large scale integration (LSI) circuit substrates from which a plurality of negative ohmic resistance (NOR) gate logic circuits can be formed and interconnected to form more complex logic circuits is described. The GLS is formed so that a plurality of overlay masks defining cuts and contacts on the GLS transforms it into a specific custom logic circuit comprising a plurality of NOR gates. The overlay masks defining cuts and contacts can be computer generated, thereby providing a means whereby custom LSI cicuits can be rapidly manufactured, tested, and reconfigured at a minimum cost. J.D.



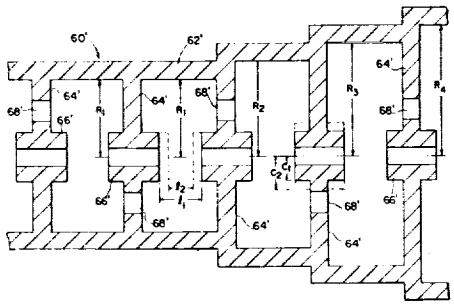
N82-26568* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

COUPLED CAVITY TRAVELING WAVE TUBE WITH VELOCITY TAPERING Patent

Denis J. Connolly, inventor (to NASA) Issued 9 Feb. 1982 7 p Filed 20 Feb. 1980

(NASA-Case-LEW-12296-1; US-Patent-4,315,194; US-Patent-Appl-SN-122966; US-Patent-Class-315-3.6; US-Patent-Class-315-3.5; US-Patent-Class-330-43) Avail: US Patent and Trademark Office CSCL 09A

A coupled cavity traveling wave tube with a velocity taper, which affords beam wave resynchronization and thereby enhances is described. The wave velocity reduction is achieved by reducing the resonant frequencies of the individual resonant cavities as a function of the distance from the electron gun, through changes in internal cavity dimensions. The required changes in cavity dimensions can be accomplished by gradually increasing the cavity radius decreasing the gap length from cavity to cavity. The velocity reduction is carried out without an increase in circuit resistive losses and the upper and lower cut off frequencies are reduced in approximately the same manner. E.A.K.



N82-26569* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

MAGNETIC FIELD CONTROL Patent

Walter Haeussermann, inventor (to NASA) Issued 26 Jan. 1982 5 p Filed 11 Jan. 1980 Supersedes N80-17359 (18 - 08, p 0997)

(NASA-Case-MFS-23828-1; US-Patent-4,313,077; US-Patent-Appl-SN-111436; US-Patent-Class-318-806; US-Patent-Class-318-812; US-Patent-Class-318-830; US-Patent-Class-318-254) Avail: US Patent and Trademark Office CSCL 09C

A torque control for an electromechanical torquing device of a type where a variable clearance occurs between a rotor and field is described. A Hall effect device senses the field present, which would vary as a function of spacing between field and rotor. The output of the Hall effect device controls the power applied to the field so as to provide a well defined field and thus a controlled torque to the rotor which is well defined.

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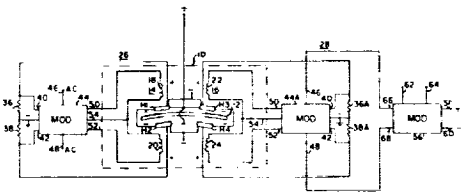

N82-26570* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

DIGITAL DEMODULATOR Patent

Thomas A. Shull, Inventor (to NASA) Issued 26 Jan. 1982 6 p Filed 18 Jul. 1980 Supersedes N80-31731 (18 - 22, p 3000)

(NASA-Case-LAR-12659-1; US-Patent-4,313,103; US-Patent-Appl-SN-171928; US-Patent-Class-340-347DD) Avail: US Patent and Trademark Office

A digital demodulator for converting pulse code modulated data from phase shift key (PSK) to non return to zero (NRZ) and to biphase data is described. The demodulator is composed of standard integrated logic circuits. The key to the demodulation function is a pair of cross coupled one shot multivibrators and which with a flip-flop produce the NRZ-L is all that is required, the circuitry is greatly simplified and the 2(v) times bit rate contraint can be removed from the carrier. A flip-flop, an OR gate, and AND gate and a binary counte generate the bit rate clock (BTCK) for the NRZ-L. The remainder of the circuitry is for converting the NRZ-L and BTCK into biphase data. The device was designed for use in the space shuttle bay environment measurements.

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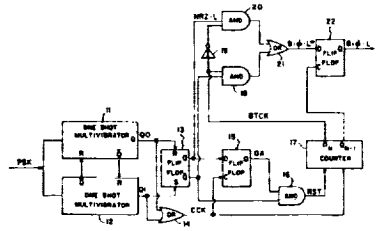


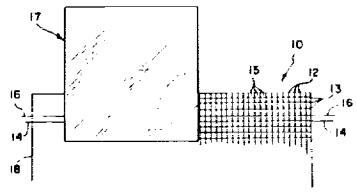
N82-26571* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ONE-STEP DUAL PURPOSE JOINING TECHNIQUE Patent

John D. Buckley, Robert J. Swaim, and Robert L. Fox, inventors (to NASA) Issued 2 Feb. 1982 4 p Filed 30 Aug. 1979 Supersedes N80-11469 (18 - 02, p 0203)

(NASA-Case-LAR-12595-1; US-Patent-4,313,777; US-Patent-Appl-SN-070774; US-Patent-Class-156-272; US-Patent-Class-156-71; US-Patent-Class-156-157; US-Patent-Class-156-379.7; US-Patent-Class-219-10.41; US-Patent-Class-219-10.53; US-Patent-Class-219-545; US-Patent-Class-428-247) Avail: US Patent and Trademark Office CSCL 09A

This fastener used in induction heating is a wire screen basically of an eddy current carrying material such as carbon steel. Selected wires in the screen are copper, sheathed in an insulating material. The screen is placed between two sheets of thermoplastics. When inductively heated, the composite softens and flows around the apertures of the screen. After this heating and joining, the copper wires may be used to conduct electricity. Official Gazette of the U.S. Patent and Trademark Office



N82-26572* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

LIQUID-IMMERSIBLE ELECTROSTATIC ULTRASONIC TRANSDUCER Patent

John H. Cantrell, Jr., Joseph S. Heyman, William T. Yost, Michael A. Torbett, and Mack A. Breazeale, inventors (to NASA) Issued 12 Jan. 1982 6 p filed 21 Dec. 1979 Supersedes N80-18363 (18-09, p 1139)

(NASA-Case-LAR-12465-1; US-Patent-4,310,906; US-Patent-Appl-SN-106136; US-Patent-Class-367-181; US-Patent-Class-73-724; US-Patent-Class-361-283) Avail: US Patent and Trademark Office CSCL 09A

A broadband megahertz range electrostatic acoustic transducer for use in a liquid environment is described. A liquid tight enclosure includes a metallic conducting membrane as part of its outside surface and has a means inside the liquid tight enclosure for applying a tension to the membrane and for mounting an electrode such that the flat end of the electrode is aproximately parallel to the membrane. The invention includes structure and a method for ensuring that the membrane and the flat end of the electrode are exactly parallel and a fixed predetermined distance from each other.

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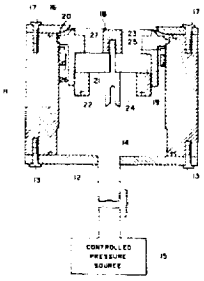


N82-26573*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

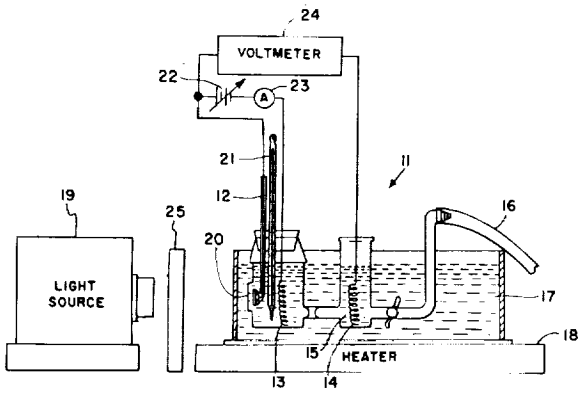
METHOD FOR DETERMINING THE POINT OF ZERO ZETA POTENTIAL OF SEMICONDUCTOR MATERIALS Patent Application

Benjamin Reichman (Christopher Newport Coll.) and Charles E. Byvik, inventors (to NASA) Filed 31 Mar. 1982 11 p

(NASA-Case-LAR-12893-1; US-Patent-Appl-SN-364041) Avail: NTIS HC A02/MF A01 CSCL 09A

A method for determining the potential of zero charge of an unpowdered semiconductor material is discussed. The semiconductor material is used as the working electrode of a standard three-electrode photoelectrochemical cell. The onset potential of the semiconductor material is measured at several different cell temperatures. The slope of the graph of onset potential versus temperature is used to compute the potential of zero charge.

NASA



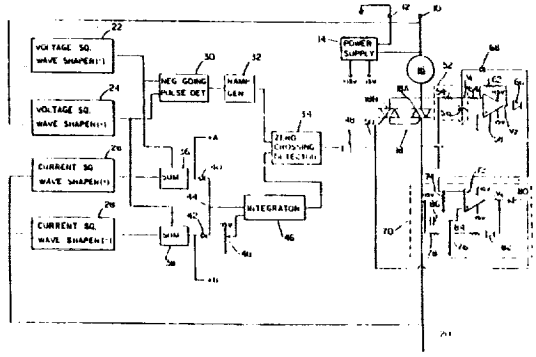
N82-26574*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

TRIAC FAILURE DETECTOR Patent Application

Frank J. Nola, inventor (to NASA) Filed 30 Nov. 1981 24 p

(NASA-Case-MFS-25607-1; US-Patent-Appl-SN-325886) Avail: NTIS HC A02/MF A01 CSCL 09C

Failure detection circuits used to detect unidirectional failures in Triacs, particularly as used in power factor controllers for induction motors, are described. A schematic circuit diagram of a power factor controller for a motor which includes two Triacs is presented. The failure detection circuit includes an operational amplifier and associated circuitry which produces a predetermined output responsive to detecting an unbalanced load voltage signal. A comparator turns the Triacs full on in both directions in response to such an output. A second schematic is presented, which includes a pair of operational amplifiers which receive phase difference inputs from the terminals and a comparator which turns the Triacs full on in response to a predetermined output from the amplifiers. Waveforms associated with both applications are illustrated. An open circuit failure detector which turns the Triacs off in response to a predetermined output from the circuits is illustrated. The device provides failure detection circuitry for detecting failure of a Triac in either the positive or negative direction, thus improving the performance of power factor controllers in which such Triacs are used. J.D.



N82-26575*# National Aeronautics and Space Administration. Pasadena Office, Calif.

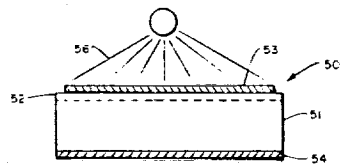
ELECTRODES FOR SOLID STATE DEVICES Patent Application

Donald B. Bickler, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 22 Nov. 1982 17 p

(Contract NAS7-100)

(NASA-Case-NPO-15161-1; US-Patent-Appl-SN-325083) Avail: NTIS HC A02/MF A01 CSCL 09A

The invention relates to coated metal powders and to dispersions of such powders in liquid vehicles forming screenable, sinterable pastes for use in forming electrodes on photovoltaic devices. The primary nickel or copper metal particles are provided with a carrier of lower melting sintering metals such as 1-20% by weight, of a non-oxidizing metal such as lead or tin. The powdered metal systems operate on the basis of fusing together by way of eutectic alloying. As the paste is heated during firing the organic binder is first vaporized. An eutectic of the base metal (copper) and coating (tin) forms at the intersections of the base metal grains. This eutectic dissolves the grains and as the temperature is raised above the eutectic temperature, more of the base metal is dissolved. While the temperature is held at the higher value, the much smaller amount of sintering metal disappears as the eutectic dissolves and diffuses into the base metal until the composition of the eutectic is so enriched with base metal that it no longer has the eutectic properties and it solidifies. In this high temperature solidification, the base metal grains became thoroughly alloyed together and will not separate at the eutectic temperature (a lower temperature than their solidification by diffusion). T.M.



N82-28545* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala

PHOTOELECTRIC DETECTION SYSTEM Patent

James R. Currie and Raymond R. Schansman, inventors (to NASA) Issued 9 Mar. 1982 7 p Filed 30 Apr 1980 Supersedes N80-25134 (18 - 15, p 2057)

(NASA-Case-MFS-23776-1; US-Patent-4,319,133; US-Patent-Appl-SN-145272; US-Patent-Class-250-214; US-Patent-Class-250-221) Avail: US Patent and Trademark Office CSCL 09A

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

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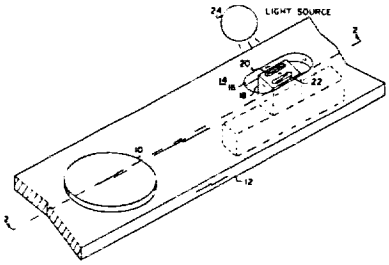


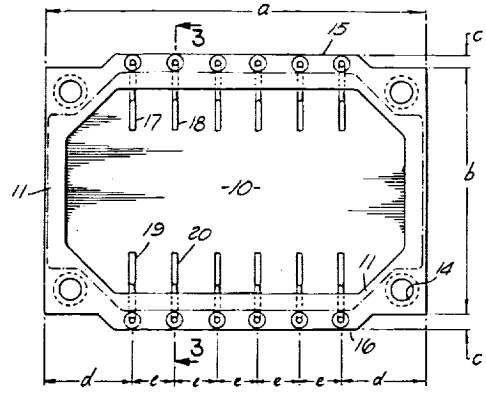
N82-28549*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

HERMETICALLY SEALABLE PACKAGE FOR HYBRID SOLID-STATE ELECTRONIC DEVICES AND THE LIKE Patent Application

Wilson N. Miller (Rockwell International, Anaheim, Calif.) and Ormal E. Gray, inventors (to NASA) (Rockwell International, Anaheim, Calif.) Filed 25 Jun 1982 13 p Sponsored by NASA

(NASA-Case-MSC-20181-1; US-Patent-Appl-SN-392093) Avail: NTIS HC A02/MF A01 CSCL 09A

A light weight, inexpensively fabricated, hermetically sealable, repairable package for small electronic or electromechanical units, having multi connections is described. A moulded ring frame of polyamide-imide plastic (Torlon) is attached along one edge to a base plate formed of a highly heat conducting material, such as aluminum or copper. Bores are placed through a base plate within the area of the edge surface of ring frame which result in an attachment of the ring frame to the base plate during moulding. Electrical leads, are moulded into the ring frame. The leads are L shaped gold plated copper wires imbedded within widened portions of the side wall of the ring frame. Within the plastic ring frame wall the leads are bent (typically, although not necessarily at 90 deg.) so that they project into the interior volume of the ring frame for connection to the solid state devices. NASA



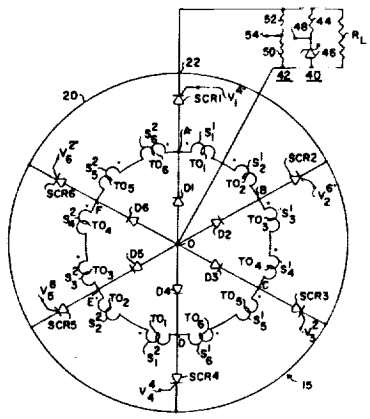
N82-28550*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

A dc TO dc CONVERTER Patent Application

Albert E. Willis, John M. Gould, Jack L. Matheney, and Harrison Garrett, inventors (to NASA) Filed 28 May 1982 17 p Sponsored by NASA

(NASA-Case-MFS-25430-1; US-Patent-Appl-SN-383083) Avail: NTIS HC A02/MF A01 CSCL 09A

A rectangular wave signal generated by a high frequency oscillator is divided down to a selected frequency by divider and then fed to a ring counter which develops six square wave signals varying in time by 30 deg. Each of these signals is then amplified and fed to one of six output transformers, each of which has an S(1) winding and an S(2) winding. The S(1) series set of windings are connected in series to form a second set. The two sets are connected in series in a closed loop or circle. The various phased signals are combined via a first rectifier in the form of an SCR, connected between a terminal at each two windings of the series and the direct current positive output terminal. A rectifier is connected from the same terminal point to the zero or negative terminal of the output. By varying the turn on time of the SCRs as a function of the output voltage, output voltage can be regulated. NASA



N82-29538* National Aeronautics and Space Administration. Pasadena Office, Calif.

CONTROL MEANS FOR A SOLID STATE CROSSBAR SWITCH Patent

Tage O. Anderson (JPL, Pasadena, Calif.) and Alan M. Lovelace, inventors (to NASA) (JPL, Pasadena, Calif.) Issued 25 May 1982 9 p Filed 29 Sep. 1980 Supersedes N80-33679 (18 24, p 3273) Sponsored by NASA

(NASA-Case-NPO-15066-1; US-Patent-4,331,956; US-Patent-Appl-SN-191744; US-Patent-Class-340-825.89; US-Patent-Class-179-18GF; US-Patent-Class-370-67) Avail: US Patent and Trademark Office CSCL 09C

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

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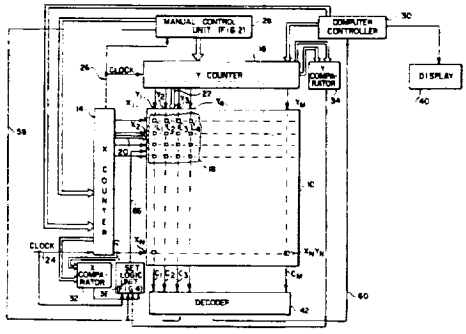

N82-29539* National Aeronautics and Space Administration. Pasadena Office, Calif.

DISCRIMINATOR AIDED PHASE LOCK ACQUISITION FOR SUPPRESSED CARRIER SIGNALS Patent

Lansing M. Carson (Motorola, Inc., Scottsdale, Ariz.) and F. Elvin Krasin, inventors (to NASA) (Motorola, Inc., Scottsdale, Ariz.) Issued 22 Jun. 1982 6 p Filed 15 Dec. 1978 Supersedes N79-14276 (17 - 05, p 0585) Sponsored by NASA

(NASA-Case-NPO-14311-1; US-Patent-4,336,616; US-Patent-Appl-SN-969762; US-Patent-Class-455-202; US-Patent-Class-455-208; US-Patent-Class-455-234; US-Patent-Class-455-306; US-Patent-Class-328-166) Avail: US Patent and Trademark Office CSCL 09C

A discriminator aided technique for acquisition of phase lock to a suppressed carrier signal utilizes a Costas loop which is initially operated open loop and control voltage for its VCXO is derived from a phase detector that compares the VCXO to a reference frequency thus establishing coarse frequency resolution with the received signal. Then the Costas loop is closed with the low-pass filter of the channel having a bandwidth much greater (by a factor of about 10) than in the I channel so that a frequency discriminator effect results to aid carrier resolution. Finally, after carrier acquisition, the Q-channel filter of the Costas loop is switched to a bandwidth substantially equal to that of the I-channel for carrier tracking.

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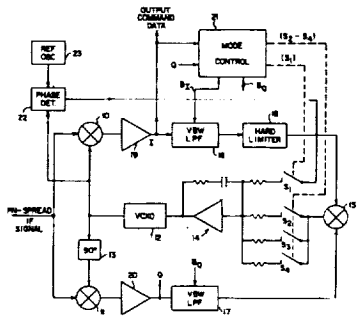


N82-30472*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

ENERGY SAVING ELECTRICAL MOTOR CONTROL SYSTEM Patent Application

Teddy M. Edge, inventor (to NASA) Filed 23 Jul. 1982 13 p (NASA-Case-MFS-25560-1; US-Patent-Appl-SN-401283) Avail: NTIS HC A02/MF A01 CSCL 09A

An energy saving system in a c electrical motors which provides optimum control of the triac control voltage supplied to different motors with which the system is used, despite the different characteristics of such motors is described. A three phase motor, including a triac control circuit for each phase is shown. Triggering of triac is controlled by the light output of LED received by photocell resistance. Zener diode controls charging of timing capacitor for the triac regardless of the motor back EMF. The physical arrangement of LED and individual photocells are shown. An alternative embodiment using constant current diodes to provide constant current charging of timing capacitor independently of motor back EMF is used. NASA

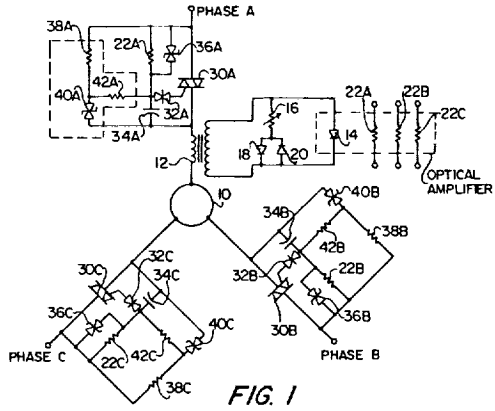


FIG. 1

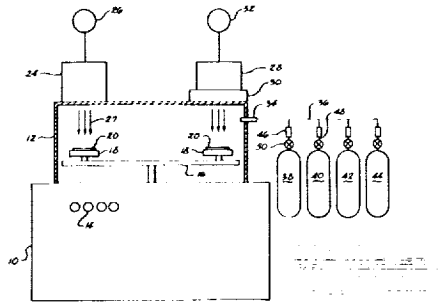
N82-33634*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

METHOD FOR SEQUENTIALLY PROCESSING A MULTI-LEVEL INTERCONNECT CIRCUIT IN A VACUUM CHAMBER Patent Application

Donald E. Routh and Gian C. Sharma, inventors (to NASA) (Sharma and Associates) Filed 19 Aug. 1982 16 p

(NASA-Case-MFS-15670-1; US-Patent-Appl-SN-409679) Avail: NTIS HC A02/MF A01 CSCL 09C

The processing of wafer devices to form multilevel interconnects for microelectronic circuits is described. The method is directed to performing the sequential steps of etching the via, removing the photo resist pattern, back sputtering the entire wafer surface and depositing the next layer of interconnect material under common vacuum conditions without exposure to atmospheric conditions. Apparatus for performing the method includes a vacuum system having a vacuum chamber in which wafers are processed on rotating turntables. The vacuum chamber is provided with an RF sputtering system and a DC magnetron sputtering system. A gas inlet is provided in the chamber for the introduction of various gases to the vacuum chamber and the creation of various gas plasma during the sputtering steps. 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.*

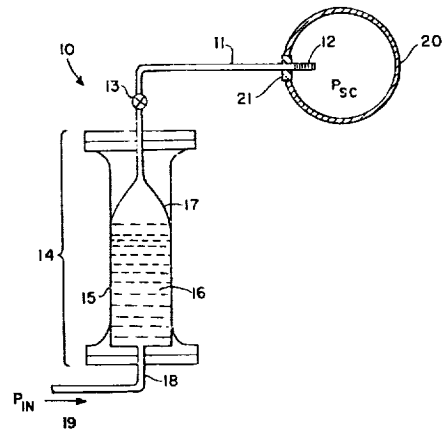
N82-24448*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

POWDER FED SHEARED DISPERSAL PARTICLE GENERATOR Patent Application

E. Leon Morrisette and Dennis M. Bushnell, inventors (to NASA) Filed 28 Aug. 1981 11 p

(NASA-Case-LAR-12785-1; US-Patent-Appl-SN-297488) Avail: NTIS HC A02/MF A01 CSCL 20D

A particle generating system is described which is capable of breaking up agglomerations of particles and producing a cloud of uniform, submicron-sized particles at high pressure and high flow rates. This is achieved by utilizing a tubular structure which has injection microslits on its periphery to accept and disperse the desired particle feed. By suppling a carrying fluid at a pressure, of approximately twice the ambient pressure of the velocimeter's settling chamber, the microslits operate at choked flow conditions. The shearing action of this choked flow is sufficient to overcome interparticle bonding forces, thereby breaking up the agglomerates of the particle feed into individual particles. NASA



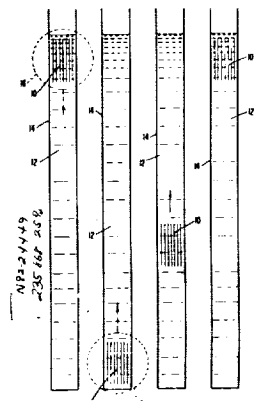
N82-24449*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

MAGNETIC HEAT PUMPING Patent Application

Gerald V. Brown, inventor (to NASA) Filed 19 Feb. 1981 20 p

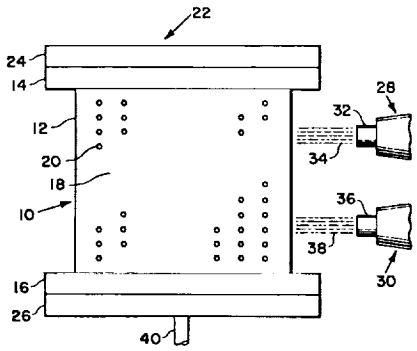
(NASA-Case-LEW-12508-3; US-Patent-Appl-SN-235868) Avail: NTIS HC A02/MF A01 CSCL 20D

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



N82-25463*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COVERING SOLID, FILM COOLED SURFACES WITH A DUPLEX THERMAL BARRIER COATING Patent Application
C. H. Liebert, inventor (to NASA) Filed 8 Dec. 1981 9 p
(NASA-Case-LEW-13450-1; US-Patent-Appl-SN-328760) Avail: NTIS HC A02/MF A01 CSCL 20D

A thermal barrier coating is applied to solid film cooled hardware. Also, thermal barrier coating systems are used to provide corrosion resistance and thermal protection to these base metal surfaces. An inert gas, such as argon, is discharged through the apertures during the application of the thermal barrier coating system by plasma spraying. This flow of inert gas reduces both blocking of the holes and base metal oxidation during the coating operation. 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*.

N82-24470* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HOT FOIL TRANSDUCER SKIN FRICTION SENSOR Patent
Thomas Vranas, inventor (to NASA) Issued 23 Feb. 1982 6 p Filed 14 Aug. 1980 Supersedes N81-12390 (19 - 03, p 0347)
(NASA-Case-LAR-12321-1; US-Patent-4,317,102; US-Patent-Appl-SN-178195; US-Patent-Class-338-25; US-Patent-Class-29-613; US-Patent-Class-338-275; US-Patent-Class-338-28) Avail: US Patent and Trademark Office CSCL 14B

The device utilizes foil transducers with only one edge exposed to the fluid flow. The surfaces are polished producing a foil transducer that does not generate turbulence while sufficiently thick to carry the required electrical current for high temperature fluid flow. The assembly utilizes a precut layered metal sandwich with attached electrodes eliminating a need for welding and individual sensor celibration.

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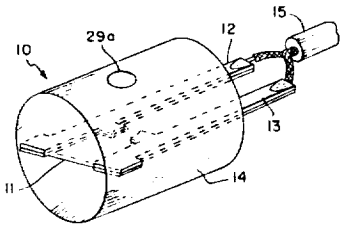

N82-24471* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
INORGANIC SPARK CHAMBER FRAME AND METHOD OF MAKING THE SAME Patent
Thomas M. Heslin, inventor (to NASA) Issued 13 Apr. 1982 9 p Filed 7 Mar. 1980 Supersedes N80-20565 (18 - 11, p 1420)
(NASA-Case-GSC-12354-1; US-Patent-4,325,001; US-Patent-Appl-SN-128229; US-Patent-Class-313-348; US-Patent-Class-250-385; US-Patent-Class-250-386; US-Patent-Class-250-389; US-Patent-Class-313-93; US-Patent-Class-29-25.14) Avail: US Patent and Trademark Office CSCL 14B

A spark chamber frame, manufactured using only inorganic materials is described. The spark chamber frame includes a plurality of beams formed from inorganic material, such as ceramic or glass, and are connected together at ends with inorganic bonding material having substantially the same thermal expansion as the beam material. A plurality of wires formed from an inorganic composition are positioned between opposed beams so that the wires are uniformly spaced and form a grid. A plurality of hold down straps are formed of inorganic material such as ceramic or glass having substantially the same chemical and thermal properties as the beam material. Hold down straps overlie wires extending over the beams and are bonded thereto with inorganic bonding material.

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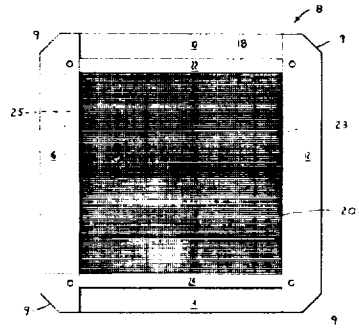
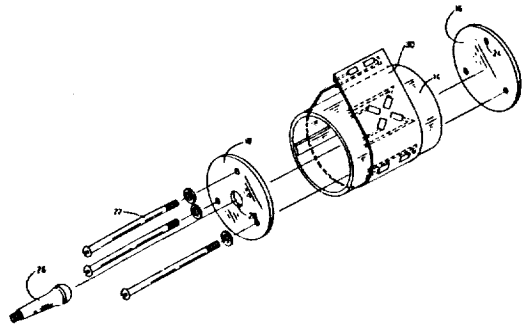


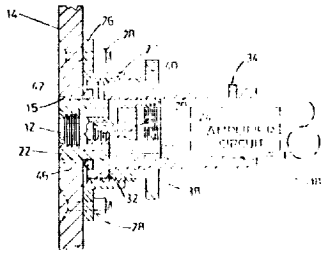
N82-24473*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
INFLATABLE DEVICE FOR INSTALLING STRAIN GAGE BRIDGES Patent Application
Clarence Cook, Glynn Smith, and Richard Monaghan, inventors (to NASA) Filed 17 Nov. 1981 15 p
(NASA-Case-FRC-11068-1; US-Patent-Appl-SN-322314) Avail: NTIS HC A02/MF A01 CSCL 14B

A method and a device are disclosed for pneumatically forcing strain gages into seated engagement with the internal surfaces of a tubular shaft in an installation of multiple strain gages in a tubular shaft. The strain gages or other electronic devices are seated in a template-like component which is wrapped about a pneumatically expansible body. The component is then inserted into a shaft and the body is expanded penumatically. A suitable adhesive is applied to the surfaces. NASA



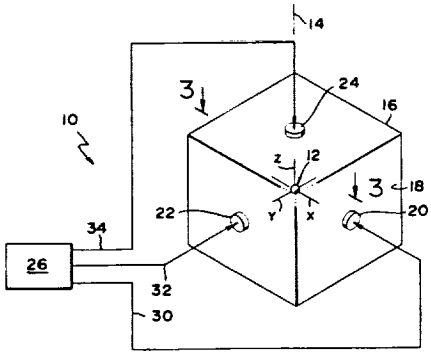
N82-24474*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
ADAPTER FOR MOUNTING MICROPHONE FLUSH WITH THE EXTERNAL SURFACE OF THE SKIN OF A PRESSURIZED AIRCRAFT Patent Application
Robert B. Cohn, inventor (to NASA) Filed 14 Dec. 1981 14 p
(NASA-Case-FRC-11072-1; US-Patent-Appl-SN-330613) Avail: NTIS HC A02/MF A01 CSCL 14B

A mounting device for securing a microphone pick-up head flush with respect to the external surfaces of the skin of an aircraft for detecting shock waves is described. The mount includes a sleeve mounted internally of the aircraft for capturing and supporting an electronics package having the microphone pick-up head attached such that the head is flush with the external surface of the aircraft skin and a pressure seal is established between the internal and external surfaces of the aircraft skin.
NASA



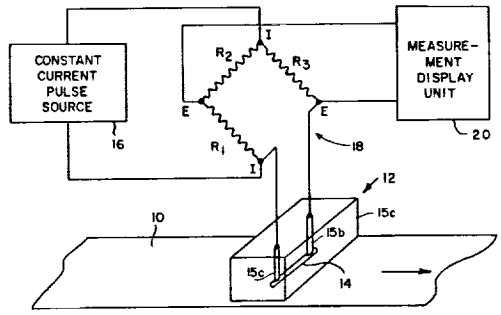
N82-24475*# National Aeronautics and Space Administration. Pasadena Office, Calif.
ACOUSTIC ROTATION CONTROL Patent Application
Daniel D. Elleman (JPL, California Inst. of Tech., Pasadena), Arvid P. Croonquist (JPL, California Inst. of Tech., Pasadena), and Taylor G. Wang, Inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 15 Mar. 1982 14 p
(Contract NAS7-100)
(NASA-Case-NPO-15689-1; US-Patent-Appl-SN-358089) Avail: NTIS HC A02/MF A01 CSCL 14B

A system is described for acoustically controlled rotation of a levitated object, which avoids deformation of a levitated liquid object. Acoustic waves of the same wavelength are directed along perpendicular directions across the object, and with the relative phases of the acoustic waves repeatedly switched so that one wave alternately leads and lags the other by 90 deg. The amount of torque for rotating the object, and the direction of rotation, are controlled by controlling the proportion of time one wave leads the other and selecting which wave leads the other most of the time.
NASA



N82-25484*# National Aeronautics and Space Administration. Pasadena Office, Calif.
INSTRUMENTATION FOR SENSING MOISTURE CONTENT OF MATERIAL USING A TRANSIENT THERMAL PULSE Patent Application
Lien C. Yang, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 30 Nov. 1981 17 p
(Contract NAS7-100)
(NASA-Case-NPO-15494-1; US-Patent-Appl-SN-325885) Avail: NTIS HC A02/MF A01 CSCL 14B

Instrumentation is developed for sensing moisture content of material using a transient thermal pulse and is comprised of a sensing probe having a sensing element in the form of a ribbon excited by a constant current pulse to increase the temperature, and therefore the resistance, of the ribbon linearly. Moisture in web material limits the increase of temperature during the pulse in proportion to the moisture content. This increase in temperature produces a proportional increase in resistivity which is measured with a Wheatsone bridge as a change in voltage displayed by a measurement display unit. The probe is glued in a shallow groove of a lucite bar and connected to copper pins embedded in the bar.
S.L.



N82-26628* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
FILM ADVANCE INDICATOR Patent
E. Thomas Freeman, Charles W. Stump, and Francis W. Dreisbach, inventors (to NASA) Issued 19 Jan. 1982 5 p Filed 18 Jul. 1980 Supersedes N80-31774 (18 - 22, p 3006)
(NASA-Case-LAR-12474-1; US-Patent-4,311,378; US-Patent-Appl-SN-171934; US-Patent-Class-354-217; US-Patent-Class-354-289; US-Patent-Class-352-171) Avail: US Patent and Trademark Office CSCL 14E

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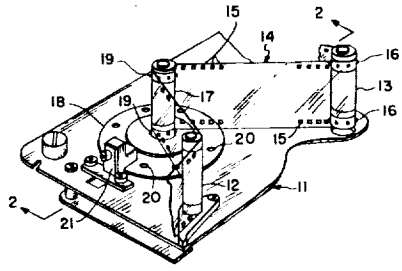
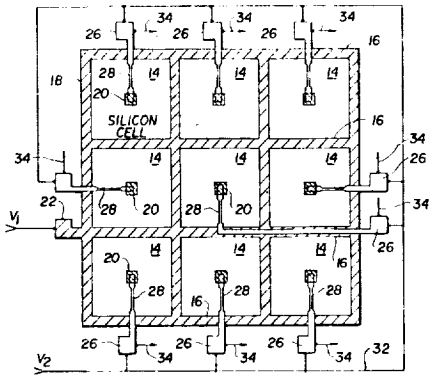


N82-26629*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
IMAGING X-RAY SPECTROMETER Patent Application
G. Alcorn, P. Grant, J. Jackson, Jr., and F. Marshall, inventors (to NASA) Filed 19 Feb. 1982 12 p
(NASA-Case-GSC-12682-1; US-Patent-Appl-SN-350477) Avail: NTIS HC A02/MF A01 CSCL 14B

An X-ray spectrometer for providing imaging and energy resolution of an X-ray source is comprised of a thick silicon

wafer having an embedded matrix or grid of aluminum completely through the wafer fabricated, for example, by thermal migration. The aluminum matrix defines the walls of a rectangular array of silicon X-ray detector cells or pixels. A thermally diffused aluminum electrode is also formed centrally through each of the silicon cells with biasing means being connected to the aluminum cell walls and the centralized aluminum electrode for causing lateral charge carrier depletion between the cell walls so that incident X-ray energy causes a photoelectric reaction within the silicon producing collectible charge carriers in the form of electrons which are collected and used for imaging. NASA



N82-26630*# National Aeronautics and Space Administration. Pasadena Office, Calif.

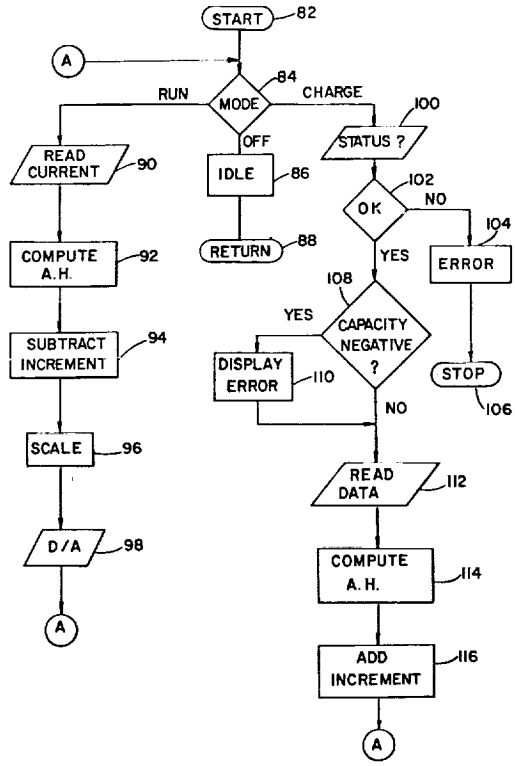
STATE-OF-CHARGE COULOMETER Patent Application

John J. Rowlette, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 9 Apr. 1982 30 p

(Contract NAS7-100)

(NASA-Case-NPO-15759-1; US-Patent-Appl-SN-367136) Avail: NTIS HC A03/MF A01 CSCL 14B

A coulometer for accurately measuring the state of charge of an open cell battery utilizing an aqueous electrolyte is described. The coulometer includes a current meter for measuring the battery charge/discharge current and a flow meter for measuring the rate at which the battery produces gas during charge and discharge. Coupled to the flow meter is gas analyzer which measures the oxygen fraction of the battery gas. The outputs of the current meter, flow meter and gas analyzer are coupled to a programmed microcomputer which includes a CPU and program and data memories. The microcomputer calculates that fraction of charge and discharge current consumed in the generation of gas so that the actual state of charge can be determined. The state of charge is then shown on a visual display. NASA



N82-26631*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

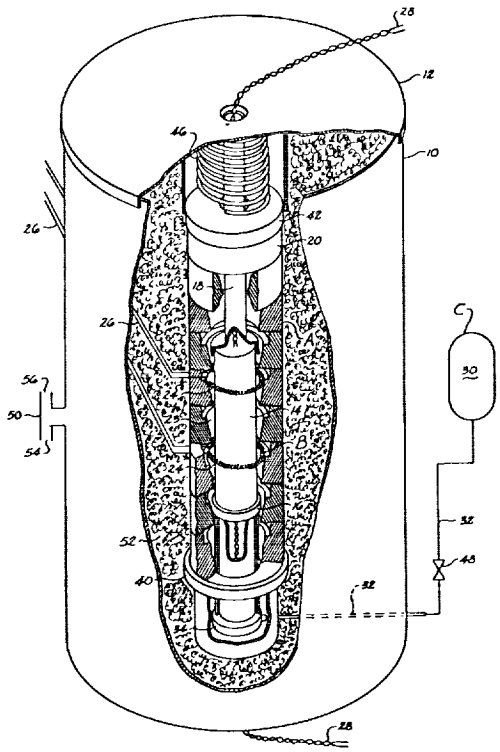
EXOTHERMIC FURNACE MODULE Patent Application

Richard M. Poorman, inventor (to NASA) Filed 18 Mar. 1982 12 p

(NASA-Case-MFS-25707-1; US-Patent-Appl-SN-359627) Avail: NTIS HC A02/MF A01 CSCL 14B

An exothermic furnace module is disclosed for processing materials in space which includes an insulated casing and a sample support, carried within the casing which supports a sample container. An exothermic heat source includes a plurality of segments of exothermic material stacked one upon another to produce a desired temperature profile when ignited. The exothermic material segments are constructed in the form of an

annular element having a recess opening which defines an open central core throughout the vertical axis of the stacked exothermic material. The sample container is arranged within the core of the stacked exothermic heating material. NASA



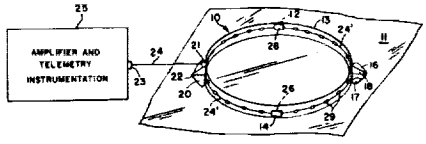
N82-26632*# National Aeronautics and Space Administration. Wallops Flight Center, Wallops Island, Va.

THIN FILM STRAIN TRANSDUCER Patent Application

James L. Rand, inventor (to NASA) (Southwest Research Inst., San Antonio, Tex.) Filed 26 Feb. 1982 13 p Sponsored by NASA

(NASA-Case-WLP-10055-1; US-Patent-Appl-SN-352827) Avail: NTIS HC A02/MF A01 CSCL 14B

A strain transducer system and process for making the same is disclosed. A beryllium copper ring having four strain gages is electrically connected in Wheatstone bridge fashion to the output instrumentation. Tabs are bonded to a balloon or like surface with strain on the surface causing bending of a ring which provides an electrical signal through the gages proportional to the surface strain. A photographic pattern of a one half ring segment as placed on a sheet of beryllium copper for chem-mill etch formation is illustrated. NASA



N82-26633*# National Aeronautics and Space Administration. Pasadena Office, Calif.

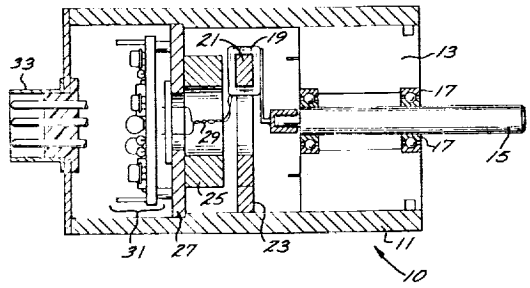
A BRUSHLESS dc TACHOMETER Patent Application

Mathias B. Handlykken, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 19 Feb. 1982 10 p

(Contract NAS7-100)

(NASA-Case-NPO-15706-1; US-Patent-Appl-SN-350475) Avail: NTIS HC A02/MF A01 CSCL 14B

A brushless dc tachometer is disclosed that includes a high strength toroidal permanent magnet for providing a uniform magnetic field in an air gap, an annular pole piece opposite the magnet, and a pickup coil wound around the pole piece and adapted to rotate about the axis of the pole piece. The pickup coil is rotated by an input shaft to which the coil is coupled with the friction clip. The output of the coil is conducted to circuitry by a twisted wire pair. The input shaft also activates a position transducing potentiometer. NASA



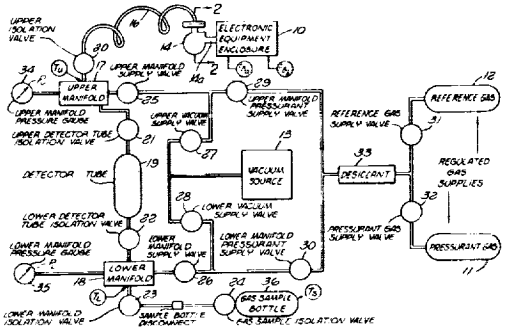
N82-26634*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

MOISTURE CONTENT AND GAS SAMPLING DEVICE Patent Application

Herman Carl Krieg, Jr., inventor (to NASA) (TRW, Inc., Redondo Beach, Calif.) Filed 19 Feb. 1982 45 p Sponsored by NASA

(NASA-Case-MSC-18866-1; US-Patent-Appl-SN-350471) Avail: NTIS HC A03/MF A01 CSCL 14B

An apparatus and method for measuring minute quantities of moisture and other contaminants within sealed enclosures such as electronic assemblies which may be subject to large external atmospheric pressure variations is described. An array of vacuum quality valves is arranged to permit cleansing of the test apparatus of residual atmospheric components from a vacuum source. This purging operation evacuates a gas sample bottle, which is then connected by valve settings to provide the drive for withdrawing a gas sample from the sealed enclosure under test into the sample bottle through a colometric detector tube (Drager tube) which indicates moisture content. The sample bottle may be disconnected and its contents (drawn from the test enclosure) separately subjected to mass spectrograph analysis. NASA



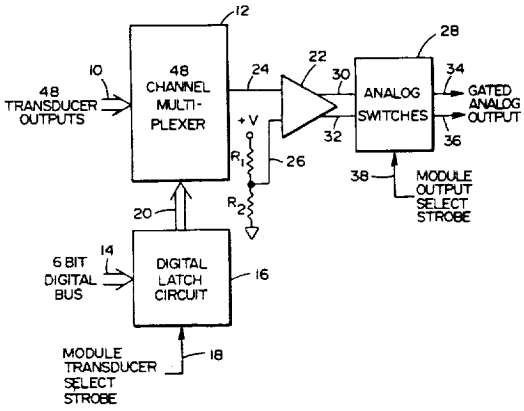
N82-26635*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ELECTRONIC SCANNING PRESSURE MEASURING SYSTEM AND TRANSDUCER PACKAGE Patent Application

Charles F. Coe and Gilbert T. Parra, inventors (to NASA) Filed 30 Apr. 1982 29 p

(NASA-Case-ARC-11361-1; US-Patent-Appl-SN-373771) Avail: NTIS HC A03/MF A01 CSCL 14B

This electronic scanning pressure system includes a plurality of pressure transducers. A means obtains an electrical signal indicative of a pressure measurement from each of the plurality of pressure transducers. A multiplexing means is connected for selectively supplying inputs from the plurality of pressure transducers to the signal obtaining means. A data bus connects the plurality of pressure transducers to the multiplexing means. A latch circuit is connected to supply control inputs to the multiplexing means. An address bus is connected to supply an address signal of a selected one of the plurality of pressure transducers to the latch circuit. In operation, each of the pressure transducers is successively scanned by the multiplexing means in response to address signals supplied on the address bus to the latch circuit. NASA



N82-26636*# National Aeronautics and Space Administration. Pasadena Office, Calif.

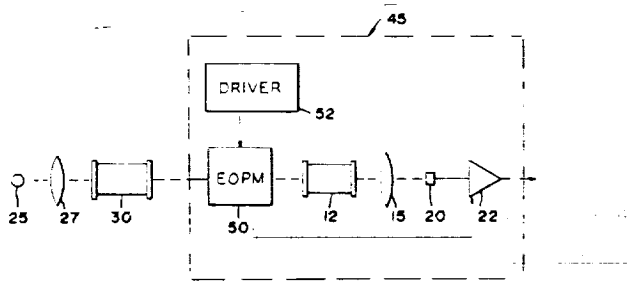
CORRELATION SPECTROMETER HAVING HIGH RESOLUTION AND MULTIPLEXING CAPABILITY Patent Application

Jack S. Margolis (JPL, California Inst. of Tech., Pasadena) and John V. Martonchik, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 30 Apr. 1982 17 p

(Contract NAS7-100)

(NASA-Case-NPO-15558-1; US-Patent-Appl-SN-373770) Avail: NTIS HC A02/MF A01 CSCL 14B

The development of a correlation spectrometer with an electro-optical phase modulator (EOPM) is discussed. The correlation spectrometer includes an EOPM and a reference cell which are fixedly positioned in the path of light from a source between a sample cell and a detector. The EOPM is adjusted so that when it is turned ON the incident radiation from the sample cell containing an absorption line is modulated so tht the energizing radiation appears as sidebands absorption patterns. The total amount of energy absorbed from the original radiation remains constant. When the EOPM is OFF, the incident radiation passes unaffected. When there is no coincidence between the constituents in the sample cell and the reference cell, the detector output is the same when the EOPM is OFF or ON. NASA



N82-28604* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va

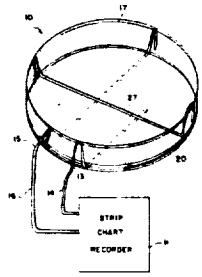
APPARATUS AND PROCESS FOR MICROBIAL DETECTION AND ENUMERATION Patent

Judd R. Wilkins and David Grana, inventors (to NASA) Issued 15 Jun 1982 7 p Filed 19 Feb 1981 Supersedes N81-29727 (19 - 20, p 2811)

(NASA-Case-LAR-12709-1; US-Patent-4,335,206; US-Patent-Appl-SN-235796; US-Patent-Class-435-34; US-Patent-Class-435-39; US-Patent-Class-435-291; US-Patent-Class-204-195B) Avail: US Patent and Trademark Office CSCL 14B

An apparatus and process for detecting and enumerating specific microorganisms from large volume samples containing small numbers of the microorganisms is presented. The large volume samples are filtered through a membrane filter to concentrate the microorganisms. The filter is positioned between two absorbent pads and previously moistened with a growth medium for the microorganisms. A pair of electrodes are disposed against the filter and the pad electrode filter assembly is retained within a petri dish by retainer ring. The cover is positioned on base of petri dish and sealed at the edges by a parafilm seal prior to being electrically connected via connectors to a strip chart recorder for detecting and enumerating the microorganisms collected on filter.

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



N82-29580*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

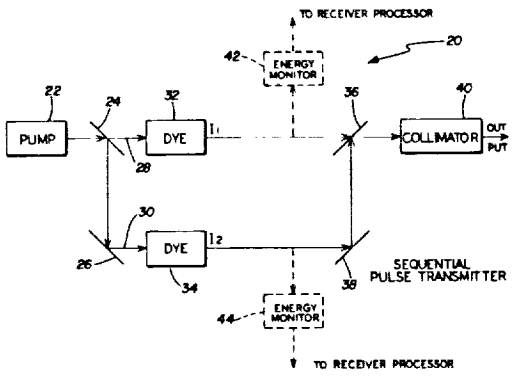
METHOD OF AN APPARATUS FOR MEASURING TEMPERATURE AND PRESSURE Patent Application

C. L. Korb and J. E. Kalshoven, Jr., inventors (to NASA) Filed 28 May 1982 29 p

(NASA-Case-GSC-12558-1; US-Patent-Appl-SN-383086) Avail: NTIS HC A03/MF A01 CSCL 14B

A method and apparatus for making remote temperature and pressure measurements of air are described. For temperature measurements, a main laser beam (probe) is transmitted at a wavelength at which the gas, which may be atmospheric, has a relatively high temperature sensitive resonant absorption characteristic and a relatively low pressure sensitive absorption characteristic. For pressure measurements, the probe laser beam is transmitted at a wavelength at which the gas has a relatively high pressure sensitive absorption characteristic and a relatively low temperature sensitive absorption characteristic. In either case, a reference beam at a wavelength having a relatively non-absorbing temperature or pressure characteristic is transmitted colinearly

with the probe beam. The ratio of the two beams returned by a target, which may be particles in the gas, the gas molecules themselves or a solid or liquid reflecting surface, is obtained to cancel the common absorption and scattering effects. NASA



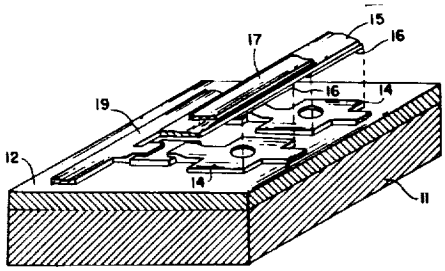
N82-31659* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PHYROELECTRIC DETECTOR ARRAYS Patent

Archibald L. Fripp, James B. Robertson, and Roger A. Breckenridge, inventors (to NASA) Issued 29 Sep. 1980 4 p Filed 29 Sep. 1980 Supersedes N81-12389 (19 - 03, p 0347)
(NASA-Case-LAR-12363-1; US-Patent-4,341,012; US-Patent-Appl-SN-191748; US-Patent-Class-29-620; US-Patent-Class-29-576J; US-Patent-Class-29-576S; US-Patent-Class-250-332; US-Patent-Class-250-370) Avail: US Patent and Trademark Office CSCL 14B

A pryoelectric detector array and the method for making it are described. A series of holes formed through a silicon dioxide layer on the surface of a silicon substrate forms the mounting fixture for the pyroelectric detector array. A series of nontouching strips of indium are formed around the holes to make contact with the backside electrodes and form the output terminals for individual detectors. A pyroelectric detector strip with front and back electrodes, respectively, is mounted over the strip. Biasing resistors are formed on the surface of the silicon dioxide layer and connected to the strips. A metallized pad formed on the surface of the layer is connected to each of the biasing resistors and to the film to provide the ground for the pyroelectric detector array.

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



N82-32659* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

LOW INTENSITY X-RAY AND GAMMA-RAY SPECTROMETER Patent

Lo I. Yin, inventor (to NASA) Issued 17 Aug. 1982 13 p Filed 30 Jul. 1980 Supersedes N80-29635 (18 - 20, p 2699)
(NASA-Case-GSC-12587-1; US-Patent-4,345,153; US-Patent-Appl-SN-173524; US-Patent-Class-250-369) Avail: US Patent and Trademark Office CSCL 20F

A low intensity X-ray and gamma ray spectrometer for imaging, counting, and energy resolving of single invisible radiation particles is described. The spectrometer includes a converting device for converting single invisible radiation particles to visible light photons. Another converting device converts the visible light photons to photoelectrons. A fiber optics coupling device couples together the two converting devices. An intensifying device intensifies the photoelectrons by an average gain factor of between 10 to the 4th power and 10 to the 7th power. The tensifying device is an anti-ion feedback microchannel plate amplifier which is operated substantially below saturation. A displaying device displays the intensified photoelectrons. The displaying device 32 indicates the spatial position, number, and energy of the incoming single invisible radiation particles.

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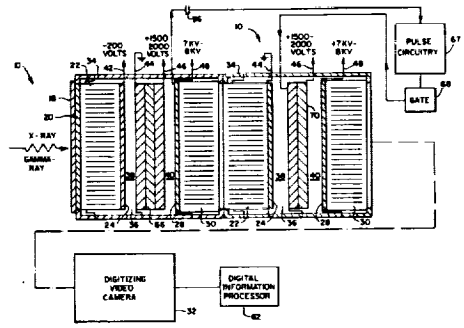


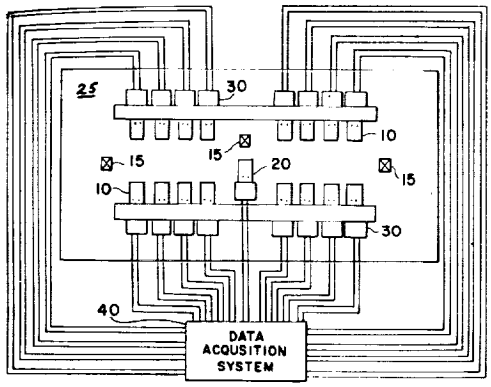
N82-32661*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

STRAIN GAGE CALIBRATION Patent Application

Thomas C. Moore, inventor (to NASA) Filed 27 Apr. 1982 15 p
(NASA-Case-LAR-12743-1; US-Patent-Appl-SN-372279) Avail: NTIS HC A02/MF A01 CSCL 14B

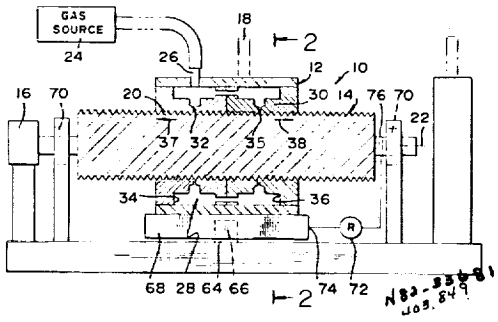
A temporary bonding system for accurately predetermining the individual apparent strain curve characteristics of the gages is used, and subsequently employs a computer to match the apparent strain curves of the individual gages to determine which gages should be used together on transducers. The temporary bonding system requires a test block on which the gages are temporarily bonded, several thermocouples for monitoring temperature, and a data acquisition system for recording apparent strain data. Initially, a group of strain gages are attached to the test block using a bonding agent that disintegrates at high temperatures. The gages are then wired to an appropriate data acquisition system and data collected throughout a predetermined temperature excursion. Once

the data is obtained, the test block is heated until the bonding agent disintegrates, freeing the gages from the test block. The gages are then disconnected from the data acquisition system and cleaned, thereby ready for use on transducers. NASA



N82-33681*# National Aeronautics and Space Administration. Pasadena Office, Calif.
LOW NOISE LEAD SCREW POSITIONER Patent Application
Gerald S. Perkins, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 30 Jul. 1982 11 p Sponsored by NASA (Contract NAS7-100)
(NASA-Case-NPO-15617-1; US-Patent-Appl-SN-403849) Avail: NTIS HC A02/MF A01 CSCL 14B

A very precise and low noise lead screw positioner, for positioning a retroreflector in an interferometer is described. A gas source supplies inert pressurized gas, that flows through narrow holes into the clearance space between a nut and the lead screw. The pressurized gas keeps the nut out of contact with the screw. The gas flows axially along the clearance space, into the environment. The small amount of inert gas flowing into the environment, avoid pollution. By allowing such flow into the environment, no seals are required between the end of the nut and the screw, which would cause noise (small irregular movements) as the screw turned. NASA



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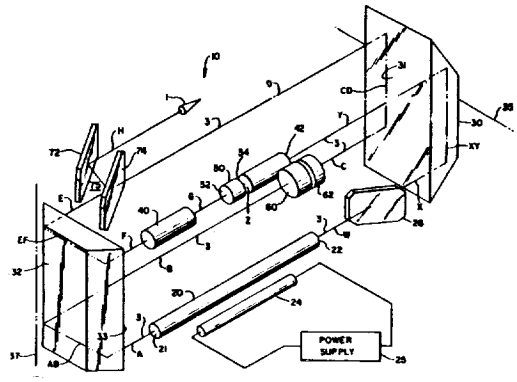
36 LASERS AND MASERS

Includes parametric amplifiers.

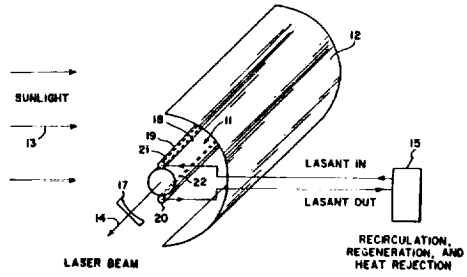
N82-24485*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
LASER RESONATOR Patent Application
Lawrence W. Harper, inventor (to NASA) (International Laser Systems, Inc.) Filed 5 Jun. 1981 18 p Sponsored by NASA
(NASA-Case-GSC-12565-1; US-Patent-Appl-SN-270763) Avail: NTIS HC A02/MF A01 CSCL 20E

An optical resonator cavity configuration uses a unitary mirror with an oppositely directed convex reflective surface and a concave reflective surface disposed into one fold which concertedly reverses both ends of a beam propagating from a laser rod disposed between two total internal reflection prisms. The prisms are rigidly positioned with perpendicularly crossed virtual rooflines by a compact optical bed. The rooflines of the internal reflection prisms are arranged perpendicularly to the axis of the laser beam and to the optical axis of the optical resonator components. NASA



N82-25497*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A SOLAR PUMPED LASER Patent Application
Ja H. Lee (Vanderbuilt Univ.), Frank Hohl, inventors (to NASA) and Willard R. Weaver Filed 4 Dec. 1981 16 p
(NASA-Case-LAR-12870-1; US-Patent-Appl-SN-327658) Avail: NTIS HC A02/MF A01 CSCL 20E

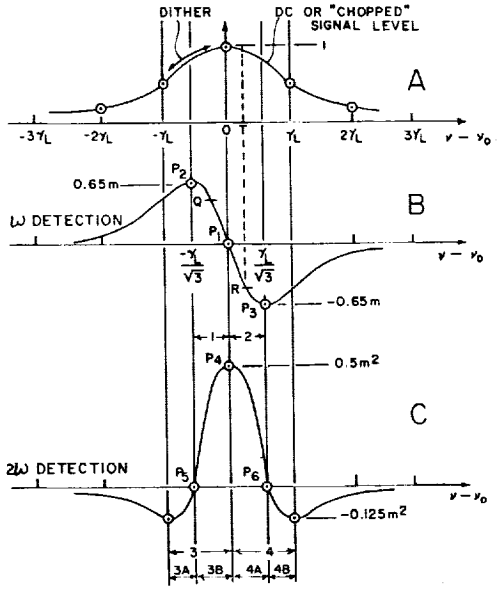
A solar pumped laser in which the lasant is a gas is described The gas will photodissociate and lase when subjected to sunrays. Sunrays are collected and directed onto the gas lasant to cause it to lase. NASA



N82-26652*# National Aeronautics and Space Administration. Pasadena Office, Calif.
SPECTROPHONE STABILIZED LASER WITH LINE CENTER OFFSET FREQUENCY CONTROL Patent Application
Michael J. Kavaya (JPL, California Inst. of Tech., Pasadena) and Robert T. Menzies, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 31 Mar. 1982 26 p
(Contract NAS7-100)
(NASA-Case-NPO-15516-1; US-Patent-Appl-SN-364126) Avail: NTIS HC A03/MF A01 CSCL 20E

Continuous offset tuning of a frequency stabilized CW gas laser is achieved by using a spectrophone filled with the same gas as the laser for sensing a dither modulation and detecting a first or second derivative of the spectrophone output with a lock in amplifier. The detected output is integrated, and the integrator output is applied as a correction signal through a circuit which adds to the dither signal from an oscillator. A dc offset is a adjusted with a potentiometer to a frequency offset

from the absorption line center of the gas, but within the spectral linewidth of the gas. Tuning that offset frequency is achieved by adding a dc value (B2) to the detected output of the dither modulation before integration using a potentiometer. NASA



N82-28616* National Aeronautics and Space Administration. Pasadena Office, Calif.

HIGH POWER METALLIC HALIDE LASER Patent

Thomas J. Pivirotto, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 4 May 1982 10 p Filed 7 Feb. 1980 Supersedes N80-18381 (18 - 09, p 1142) Sponsored by NASA

(NASA-Case-NPO-14782-1; US-Patent-4,328,464; US-Patent-Appl-SN-119339; US-Patent-Class-330-4.3; US-Patent-Class-372-56; US-Patent-Class-372-58; US-Patent-Class-372-82) Avail: US Patent and Trademark Office CSCL 20E

A laser amplification system is disclosed whereby a metallic halide vapor such as copper chloride is caused to flow through a laser amplifier and a heat exchanger in a closed loop system so that the flow rate is altered to control the temperature rise across the length of the laser amplifier. The copper atoms within the laser amplifier should not exceed a temperature of 3000 K, so that the number of copper atoms in the metastable state will not be high enough to prevent amplification in the amplifier. A molecular dissociation apparatus is provided at the input to the laser amplifier for dissociating the copper chloride into copper atoms and ions and chlorine atoms and ions. The dissociation apparatus includes a hollow cathode tube and an annular ring spaced apart from the tube end. A voltage differential is applied between the annular ring and the hollow cathode tube so that as the copper chloride flows through, it is dissociated into copper and chlorine ions and atoms.

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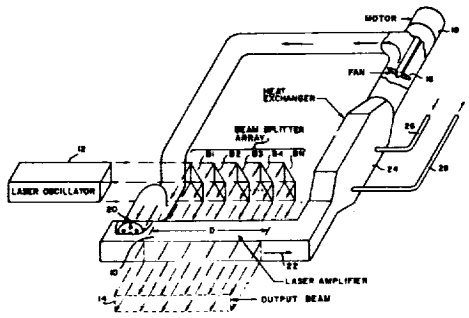


N82-28618*# National Aeronautics and Space Administration. Pasadena Office, Calif.

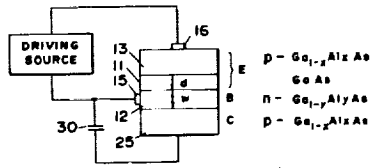
ARRANGEMENT FOR DAMPING THE RESONANCE IN A LASER DIODE Patent Application

Joseph Katz (JPL), Amnon Yariv (JPL), and Shlomo Margalit, inventors (to NASA) (JPL) Filed 4 Jun. 1982 17 p

(Contract NAS7-100)

(NASA-Case-NPO-15980-1; US-Patent-Appl-SN-385220) Avail: NTIS HC A02/MF A01 CSCL 20E

A novel arrangement for damping the resonance of a laser diode is described. The arrangement includes an additional layer which together with the conventional laser diode form a structure of a bipolar transistor. The additional layer serves as the collector, the cladding layer next to it as the base, and the active region and the other cladding layer as the emitter. A capacitor is connected across the base and the collector. At any frequency above a certain selected frequency which is far below the resonance frequency, the capacitor impedance is very low, effectively shorting the base to the collector. The capacitor is a discrete component external to the laser structure or formed as part of a monlithic structure including the laser diode and the additional layer. NASA



N82-28619*# National Aeronautics and Space Administration. Pasadena Office, Calif.

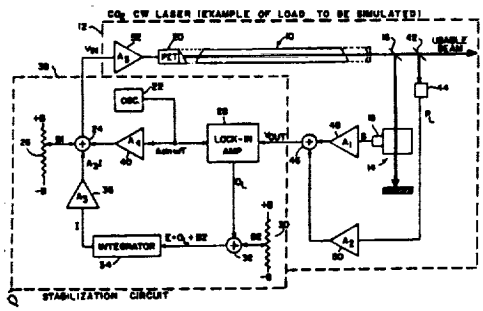
METHOD AND APPARATUS FOR TRANSFER FUNCTION SIMULATOR FOR TESTING COMPLEX SYSTEMS Patent Application

Michael J. Kavaya, inventor (to NASA) (JPL) Filed 11 Jun. 1982 28 p

(Contract NAS7-100)

(NASA-Case-NPO-15696-1; US-Patent-Appl-SN-387647) Avail: NTIS HC A03/MF A01 CSCL 20E

A method and apparatus for testing the operation of a complex stabilization circuit in a closed-loop system are described. A programmed analog or digital computing system for implementing the transfer function of a load, thereby providing a predictable load, comprises the method. The digital computing system employs a table stored in a microprocessor in which precomputed values of the load transfer function are stored for values of input signal from the stabilization circuit over the range of interest. NASA



N82-29589* National Aeronautics and Space Administration. Pasadena Office, Calif.

COHERENTLY PULSED LASER SOURCE Patent

Jack S. Margolis, inventor (to NASA) (JPL, Calif. Inst. of Tech., Pasadena) Issued 1 Jun. 1982 6 p Filed 15 May 1980 Supersedes N80-24602 (18 15, p 1983) Sponsored by NASA

(NASA-Case-NPO-15111-1; US-Patent-4,332,441; US-Patent-Appl-SN-150040; US-Patent-Class-350-358) Avail: US Patent and Trademark Office CSCL 20E

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

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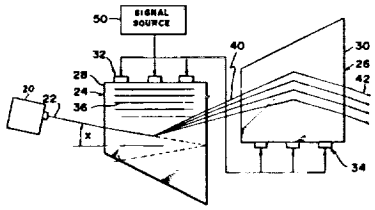

N82-32712* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SCANNING AFOCAL LASER VELOCIMETER PROJECTION LENS SYSTEM Patent

David B. Rhodes, inventor (to NASA) Issued 31 Aug. 1982 4 p Filed 7 Sep. 1979 Supersedes N80-12866 (18 - 03, p 0393)
(NASA-Case-LAR-12328-1; US-Patent-4,346,990; US-Patent-Appl-SN-073477; US-Patent-Class-356-28.5; US-Patent-Class-350-453) Avail: US Patent and Trademark Office CSCL 20E

A method and apparatus for projecting and focusing parallel laser light beams from a laser DOPPLER velocimeter on a target area are described. The system includes three lenses. Two lenses work together as a fixed afocal lens combination. The third lens is a movable scanning lens. Parallel laser beams travel from the velocimeter through the scanning lens and through the afocal lens combination and converge, i.e., are focused, somewhere beyond. Moving the scanning lens relative to the fixed afocal combination results in a scanning of the focus area along the afocal combination's optical axis.

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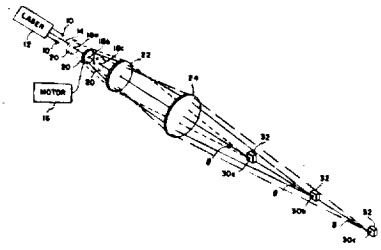

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37 MECHANICAL ENGINEERING

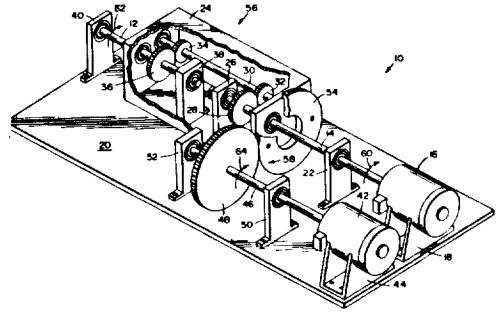
Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

N82-22496*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

CLUTCHLESS MULTIPLE DRIVE SOURCE FOR OUTPUT SHAFT Patent Application

Larry D. Webster, inventor (to NASA) (Army Aviation Research and Development Command, Moffett Field, Calif.) Filed 2 Mar. 1982 11 p Sponsored by NASA
(NASA-Case-ARC-11325-1; US-Patent-Appl-SN-354126) Avail: NTIS HC A02/MF A01 CSCL 13I

A first shaft is connected to a source of rotational power and has a gear fixedly mounted on the shaft. A second gear is fixedly mounted on a gear shaft that is parallel to the first shaft. A third gear, also fixedly mounted on gear shaft, meshes with a fourth gear fixedly mounted on the output shaft. The first input shaft and output shaft are rotatably mounted through a housing that is itself rotatable with respect to a support. Both shafts are coaxial and in end-to-end relationship. A second input shaft is connected to a second source of rotational power. A fifth gear, fixedly mounted on second input shaft, meshes with a sixth gear, which is fixedly mounted on rotatable housing and in coaxial relationship with first input shaft. In operation, the first drive source and gear train provide rotational power in a first direction to drive the output shaft in a given direction of rotation. The second source of rotational power may be operated either to decrease the rate of rotation imparted to the output shaft by the first source of rotational power, or to increase that rate of rotation, depending on which direction the housing is rotated by the second source of rotational power. NASA

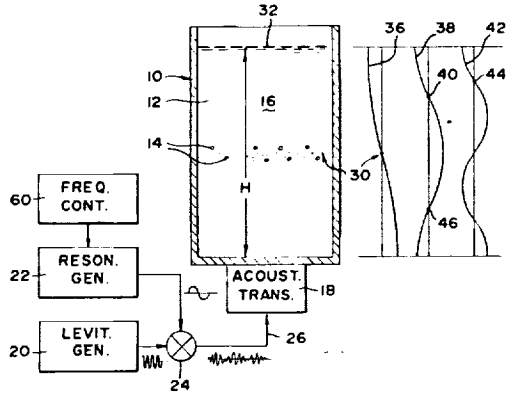


N82-22497*# National Aeronautics and Space Administration. Pasadena Office, Calif.

ACOUSTIC BUBBLE REMOVAL Patent Application

Eugene H. Trinh (JPL, California Inst. of Tech., Pasadena), Daniel D. Elleman (JPL, California Inst. of Tech., Pasadena), and Taylor G. Wang, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 21 Jan. 1982 12 p
(Contract NAS7-100)
(NASA-Case-NPO-15334-1; US-Patent-Appl-SN-341406) Avail: NTIS HC A02/MF A01 CSCL 13H

A method is described for removing bubbles from a liquid bath, such as a bath of molten glass to be used for optical elements. Larger bubbles are first removed by applying acoustic energy resonant to a bath dimension to drive the larger bubbles toward a pressure well where the bubbles can coalesce and then be more easily removed. Next, submillimeter bubbles are removed by applying acoustic energy of frequencies resonant to the small bubbles to oscillate them and thereby stir liquid immediately about the bubbles to facilitate their backup and absorption into the liquid. NASA



N82-24490* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

CONTINUOUS SELF-LOCKING SPIRAL WOUND SEAL Patent

Stephen C. Irick, inventor (to NASA) Issued 5 Jan. 1982 5 p Filed 20 Nov. 1979 Supersedes N80-16339 (18 - 07, p 0860)
(NASA-Case-LAR-12315-1; US-Patent-4,309,039;
US-Patent-Appl-SN-096257; US-Patent-Class-277-1;
US-Patent-Class-277-2; US-Patent-Class-277-4;
US-Patent-Class-277-59; US-Patent-Class-277-72R;
US-Patent-Class-277-105; US-Patent-Class-277-204;
US-Patent-Class-285-37; US-Patent-Class-220-378) Avail: US Patent and Trademark Office CSCL 11A

A spiral wound seal for effecting a seal between two surfaces is described. The seal consists of a strip of gasket material wound into a groove machined into one of the surfaces. The gasket strip is wider than the groove is deep so that a portion of the gasket material protrudes from the groove. The seal is effected by clamping the second surface onto the first surface and compressing the protruding gasket material.

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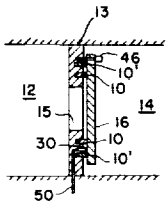


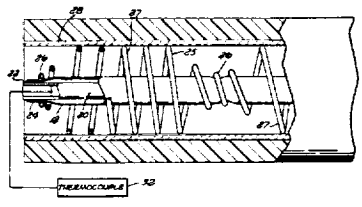
N82-24491* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

PRECISION HEAT FORMING OF TETRAFLUOROETHYLENE TUBING Patent

W. V. Ruiz (Rockwell International Corp., Downey, Calif.) and C. S. Thatcher, Inventors (to NASA) (Rockwell International Corp., Downey, Calif.) Issued 26 May 1981 5 p Filed Jan. 1980 Supersedes N80-17292 (18-08, p 0989) Sponsored by NASA (NASA-Case-MSC-18430-1; US-Patent-4,269,640;
US-Patent-Appl-SN-113015; US-Patent-Class-156-84;
US-Patent-Class-156-85; US-Patent-Class-156-86;
US-Patent-Class-264-230; US-Patent-Class-264-342R) Avail: US Patent and Trademark Office CSCL 13I

An invention that provides a method of altering the size of tetrafluoroethylene tubing which is only available in limited combination of wall thicknesses and diameter are discussed. The method includes the steps of sliding the tetrafluoroethylene tubing onto an aluminum mandrel and clamping the ends of the tubing to the mandrel by means of clamps. The tetrafluorethylene tubing and mandrel are then placed in a supporting coil which with the mandrel and tetrafluorethylene tubing are then positioned in a insulated steel pipe which is normally covered with a fiber glass insulator to smooth out temperature distribution therein. The entire structure is then placed in an event which heats the tetrafluorethylene tubing which is then shrunk by the heat to the outer dimension of the aluminum mandrel. After cooling the aluminum mandrel is removed from the newly sized tetrafluorethylene tubing by a conventional chemical milling process.

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



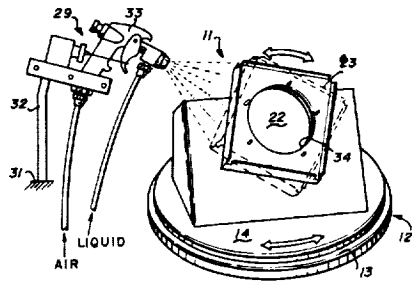
N82-24492* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SPRAY COATING APPARATUS HAVING A ROTATABLE WORKPIECE HOLDER Patent

Marnell Smith, Victor W. Katvala, and Ernest E. Porter, inventors (to NASA) Issued 26 Jan. 1982 5 p Filed 22 Sep. 1978 Supersedes N78-32434 (16 - 23, p 3085)
(NASA-Case-ARC-11110-1; US-Patent-4,312,292;
US-Patent-Appl-SN-945040; US-Patent-Class-118-320;
US-Patent-Class-118-500; US-Patent-Class-118-503;
US-Patent-Class-118-505; US-Patent-Class-427-425) Avail: US Patent and Trademark Office CSCL 13I

A spray coating apparatus is provided for rotating a workpiece relative to a spray station to obtain a uniform coating of the workpiece. In a typical example, the workpiece comprises a ceramic tile which is to be coated with a ceramic coating and the tile is to be used as a reusable component of the thermal protection system for a space shuttle. The apparatus for rotating the workpiece includes a base support having a first rotatable stage for rotation in the horizontal plane and a second rotatable stage for rotation in a second plane inclined at an angle, such as 45 degrees, to the horizontal plane and the workpiece is supported on this second stage. Thus the workpiece is rotatable in both of two planes of rotation.

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



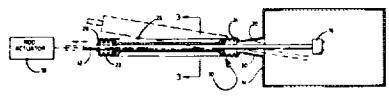
N82-24493* National Aeronautics and Space Administration. Pasadena Office, Calif.

HERMETIC SEAL FOR A SHAFT Patent

Frank Lombardi, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 19 Jan. 1982 5 p Filed 30 May 1980 Supersedes N80-25660 (18-1, p 2133) Sponsored by NASA (NASA-Case-NPO-15115-1; US-Patent-4,311,057;
US-Patent-Appl-SN-154725; US-Patent-Class-74-18.1;
US-Patent-Class-92-37; US-Patent-Class-74-18.2) Avail: US Patent and Trademark Office CSCL 11A

An hermetic seal for a linear rod having a portion thereof projected axially through a port defined in a wall for a pressure chamber and supported thereby for omni-directional motion is described. The seal is characterized by a resilient, impervious, cylindrical body having a first section concentrically related to the shaft and integrally affixed thereto comprising a linear ordered array of annular flutes. A second section integrally is affixed to the wall of the chamber and concentrically related to the port comprising a second linear ordered array of annular flutes. A third section is interposed between the first and second sections and integrally affixed in coaxial alignment therewith comprising an annular ordered array of linear flutes concentrically related to the shaft, whereby axial, angular, and pivotal motion of the rod is accommodated.

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



N82-24494* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

HIGH TEMPERATURE PENETRATOR ASSEMBLY WITH BAYONET PLUG AND RAMP-ACTIVATED LOCK Patent

Kenneth E. Wood, inventor (to NASA) (Rockwell International Corp., Downey, Calif.) Issued 23 Mar. 1982 7 p Filed 7 Feb. 1980 Supersedes N80-19468 (18 - 10, p 1293) Sponsored by NASA
(NASA-Case-MSC-18526-1; US-Patent-4,320,911;

US-Patent-Appl-SN-119335; US-Patent-Class-285-89; US-Patent-Class-285-159; US-Patent-Class-285-401; US-Patent-Class-403-315) Avail: US Patent and Trademark Office CSCL 13I

A penetration apparatus, for very high temperature applications in which a base plug is inserted into an opening through a bulkhead is described. The base plug has a head shape and is seated against the highest temperature surface of the bulkhead, which may be the skin of the nose cone or other part of a space vehicle intended for nondestructive atmospheric reentry. From the second side of the bulkhead at which the less severe environment is extant, a bayonet plug is inserted into the base plug and engages an internal shoulder at about 90 deg rotation. The bayonet plug has an integral flanged portion and a pair of ramping washers which are located between the flange and the second bulkhead surface with a spacing washer as necessary.

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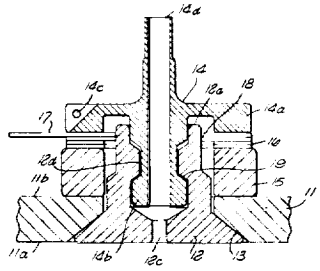


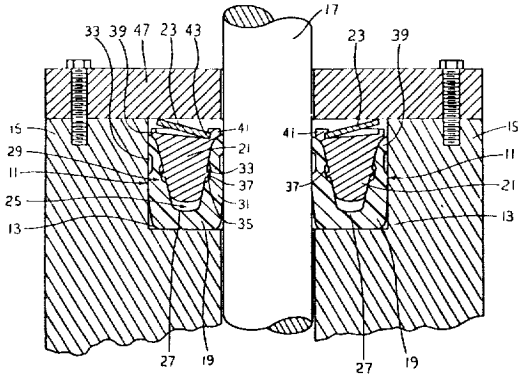
N82-25517*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

UNITARY SEAL RING ASSEMBLY Patent Application

William N. Myers and Leopold A. Hein, inventors (to NASA) Filed 13 May 1982 10 p

(NASA-Case-MFS-25678-1; US-Patent-Appl-SN-378533) Avail: NTIS HC A02/MF A01 CSCL 11A

A ring seal is installed in an annular recess for sealing the interface between the housing and a rotating or reciprocating shaft. The seal ring consists of a resilient and member having a metal ring wedge acting on it by a Belleville spring. The ring wedge has an elongated, annular projecting rib on each sloping side surface which projects into elongated annular slots along the sides forming the recess in the cup. The parts can be interlocked before installation in a unitary manner. NASA



N82-26672* National Aeronautics and Space Administration Lyndon B. Johnson Space Center, Houston, Tex.

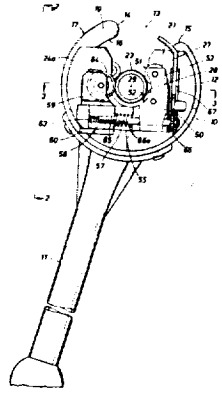
OPEN ENDED TUBING CUTTERS Patent

Anthony S. Girala, inventor (to NASA) Issued 15 Dec. 1981 9 p Filed 9 Apr. 1980 Supersedes N80-22703 (18 - 13, p 1719)

(NASA-Case-MSC-18538-1; US-Patent-4,305,205; US-Patent-Appl-SN-138944; US-Patent-Class-30-102) Avail: US Patent and Trademark Office CSCL 13I

A self clamping cutting tool which includes a handle attached to a C-shaped housing is described. Rotatably mounted within the housing is a C-shaped tool body carrying a set of clamping rolls, two support rolls, and an edged cutting roll (64). The support rolls are disposed to one side of the axis of a pipe and the cutting roll is disposed to the other side of a pipe axis so that these rolls contact a pipe at three circumferential points. Cutter advancing apparatus advance the cutting roll toward the support rollers. The support rolls and cutting roll are rotatable independently of the C-shaped housing A one way ratchet mechanism disposed between the C-shaped housing and the C-shaped tool body permits operation by movement in one rotational direction about the pipe axis.

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



N82-26673*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

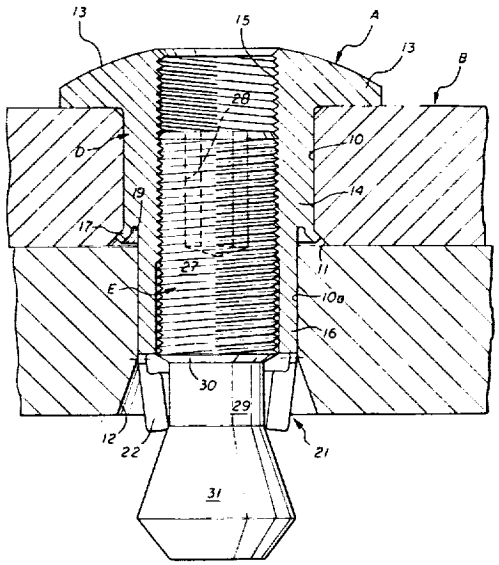
REUSABLE CAPTIVE BLIND FASTENER Patent Application

Scott A. Peterson, inventor (to NASA) (Rockwell International Corp., Houston, Tex.) Filed 14 Aug. 1981 14 p Sponsored by NASA

(NASA-Case-MSC-18742-1; US-Patent-Appl-SN-293417) Avail: NTIS HC A02/MF A01 CSCL 13I

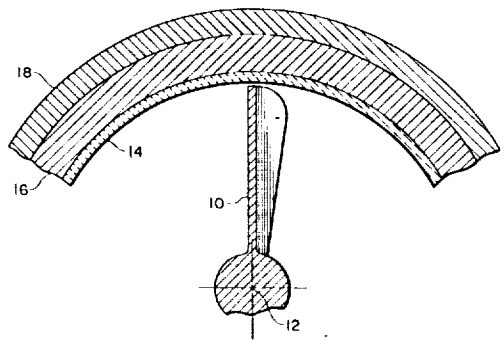
A one piece reusable fastener capable of joining materials together from one side (blind backside) comprises a screw driven pin ending in a wedge-shaped expander cone. The cone cooperates within a slotted collar end which has a number of tangs on a cylindrical body. The fastener is set by inserting it through aligned holes in the workpieces to be joined. Turning the pin in one direction draws the cone into the collar, deforming the tangs radially outward to mate with tapered back-tapered hold in the workpiece, thus fastening the two pieces together. Reversing the direction of the pin withdraws the cone from the collar, and allows the tangs to resume their contracted configuration without withdrawing the fastener from the insertion hole. The fastener

is capable of joining materials together from only one side with substantial strength in tension and shear over many resue attachment cycles, with no special operations on the main assembly parts other than the tapering of the back end of the insertion hole. NASA



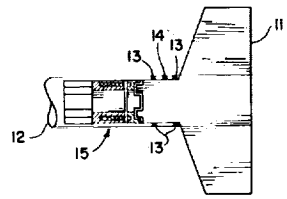
N82-26674*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FULLY PLASMA-SPRAYED COMPLIANT BACKED CERAMIC TURBINE SEAL Patent Application
Robert C. Bill and Donald W. Wisander, inventors (to NASA) Filed 30 Nov. 1981 8 p
(NASA-Case-LEW-13268-2; US-Patent-Appl-SN-325931) Avail: NTIS HC A02/MF A01 CSCL 11A

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



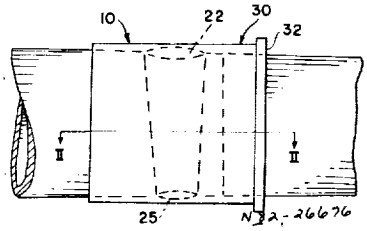
N82-26675*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MISSILE ROLLING TAIL BRAKE TORQUE SYSTEM Patent Application
William T. Davis, inventor (to NASA) Filed 11 Jan. 1982 12 p
(NASA-Case-LAR-12751-1; US-Patent-Appl-SN-338386) Avail: NTIS HC A02/MF A01 CSCL 13I

An apparatus is described for simulating varying levels of friction in the bearings of a free rolling tail afterbody on a canard controlled missile to determine friction effects on aerodynamic control characteristics. A ring located between the missile body and the afterbody is utilized in a servo system to create varying levels of friction between the missile body and the afterbody to simulate bearing friction. NASA



N82-26676*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
INTERLOCKING WEDGE JOINT Patent Application
Moses J. Long, inventor (to NASA) Filed 23 Apr. 1982 9 p
(NASA-Case-LAR-12729-1; US-Patent-Appl-SN-371353) Avail: NTIS HC A02/MF A01 CSCL 13I

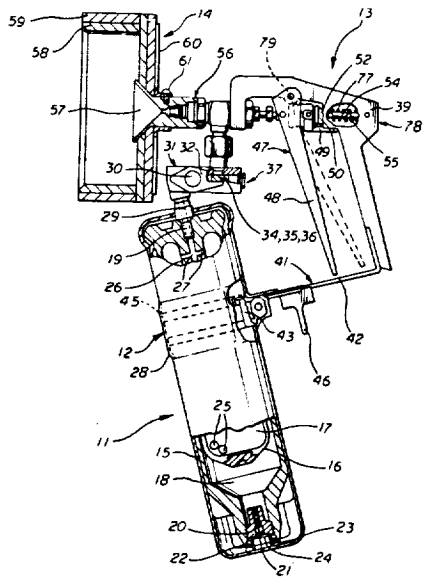
An interlocking wedge joint is described comprising a male member having a tapered columnar body with an interlocking means on the end thereof, a female member having a tapered columnar body with a receptacle means therein, and a sleeve member having a tapered tubular body. To assemble the joint the male member interlocking means is inserted transversely into the female member receptacle means and the sleeve member is slid over the male member and female member interface thus locking the members into place. NASA



N82-28640*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SPRAY APPLICATOR FOR SPRAYING COATINGS AND OTHER FLUIDS IN SPACE Patent Application
Jerome F. Kuminecz and Merlyn F. Lausten, inventors (to NASA) Filed 25 Jun. 1982 12 p Sponsored by NASA
(NASA-Case-MSC-18852-1; US-Patent-Appl-SN-392094) Avail: NTIS HC A02/MF A01 CSCL 13I

A spray applicator was developed to provide emergency thermal protection, system repair by shuttle astronauts during EVA. It is essential that such a spray applicator be self contained, suitable for one handed operation, splatter and reactive free. The spray applicator includes an accumulator, a spray gun, and a spray shield. It is formed into a rigid shell having a flexible bladder containing the liquidified coating material inserted through the adapter assembly. To pressurize the bladder, there is propellant between the bladder through an outlet passageway located in head. To assure uniform distribution one or more weighted balls are located in the bladder and to assure an uninterrupted flow,

a head includes a plurality of orifices. In the exiting accumulator, the coating material is channeled through a passageway in valve assembly which connects the accumulator to the spray gun assembly 13. NASA



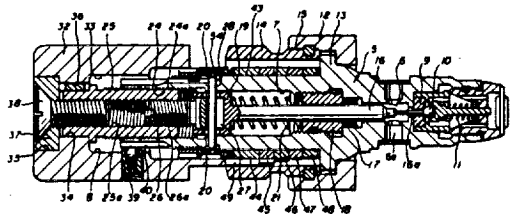
N82-28641*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SLOW OPENING VALVE Patent Application

Donald F. Drapeau, inventor (to NASA) (Hamilton Standard, Hartford, Conn.) Filed 25 Jun. 1982 12 p Sponsored by NASA

(NASA-Case-MSC-20112-1; US-Patent-Appl-SN-392104) Avail: NTIS HC A02/MF A01 CSCL 13I

A control mechanism for an oxygen shut off valve is described. The control mechanism for the valve minimizes the rate of flow when opening is initiated, increases the rate of flow after the system is pressurized, provides adjustable operating torque, and provides additional stops to prevent overtorquing and is independent of the number of turns or pitch. To accomplish this, a shut off valve for the portable oxygen system for the shuttle orbiter has a cylindrical actuator handle connected to a differentially threaded sleeve member which is connectively attached to a ball valve via valve stem having a cup shaped plunger with aligned slots, and nonrotating screw. NASA



N82-28642*# National Aeronautics and Space Administration. Pasadena Office, Calif.

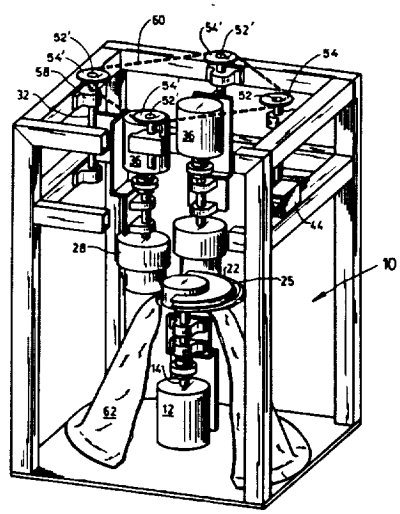
IMPROVED INGOT SLICING MACHINE Patent Application

Yu Shen Kuo, inventor (to NASA) (JPL) Filed 11 Jun. 1982 20 p

(Contract NAS7-100)

(NASA-Case-NPO-15483-1; US-Patent-Appl-SN-387648) Avail: NTIS HC A02/MF A01 CSCL 13I

A method and apparatus for simultaneously slicing one or a multiplicity of silicon boules into wafers is described. One embodiment has vertical stacks of horizontal, mutually spaced, coaxially aligned juxtaposed cutting blades; a drive for simultaneously rotating the blades; and an even plurality of chucks adapted to hold axially erect silicon boules. The chucks are disposed in pairs diametrically spaced on opposite sides of the blades for synchronous translation of the boules toward and away from the blades to balance stresses imposed on the blades in slicing off the wafers. Also a drive is used for simultaneously rotating the boules as they are positioned. Each blade is characterized by having a cutting diameter slightly greater than the cutting diameter of the blade arranged immediately above it. NASA



N82-29603*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

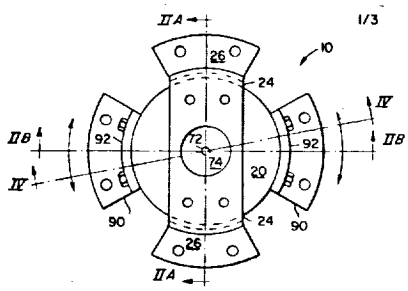
MAGNETIC BEARING AND MOTOR Patent Application

Philip A. Studer, inventor (to NASA) Filed 31 Mar. 1982 19 p

(NASA-Case-GSC-12725-1; US-Patent-Appl-SN-364093) Avail: NTIS HC A02/MF A01 CSCL 13I

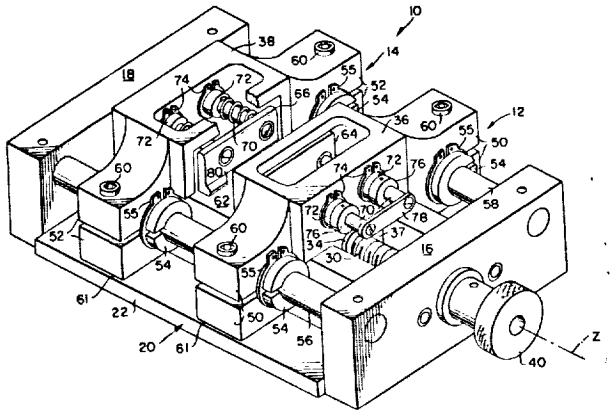
A magnetic bearing for passively suspending a rotatable element subjected to axial and radial thrust forces is disclosed. The magnetic bearing employs a taut wire stretched along the longitudinal axis of the bearing between opposed end pieces and an intermediate magnetic section. The intermediate section is segmented to provide oppositely directed magnetic flux paths between the end pieces and may include either an axially polarized magnets interposed between the segments. The end pieces, separated from the intermediate section by air gaps, control distribution of magnetic flux between the intermediate section segments. Coaxial alignment of the end pieces with the intermediate section minimizes magnetic reluctance in the flux paths endowing the bearing with self-centering characteristics when subjected to radial loads. In an alternative embodiment, pairs of oppositely wound armature coils are concentrically interposed between segments of the intermediate section in concentric arcs adjacent to radially polarized magnets to equip a magnetic bearing as a torsion drive motor, the magnetic

suspension bearing disclosed provides long term reliability without maintenance with application to long term space missions such as the VISSR/VAS scanning mirror instrument in the GOES program. J.M.S.



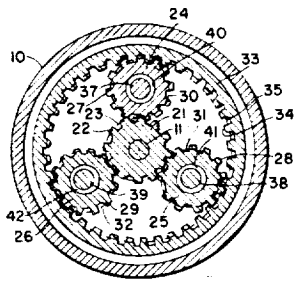
N82-29604*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
WORKPIECE POSITIONING VISE Patent Application
Frederick C. Hallberg and Clyde J. Morgan, inventors (to NASA) Filed 31 Mar. 1982 16 p
(NASA-Case-GSC-12762-1; US-Patent-Appl-SN-364094) Avail: NTIS HC A02/MF A01 CSCL 13I

A pair of jaw assemblies simultaneously driven in opposed reciprocation by a single shaft has oppositely threaded sections to automatically center delicate or brittle workpieces such as lithium fluoride crystal beneath the blade of a crystal cleaving machine. Both jaw assemblies are suspended above the vise bed by a pair of parallel guide shafts attached to the vise bed. Linear rolling bearings, fitted around the guide shafts and firmly held by opposite ends of the jaw assemblies, provide rolling friction between the guide shafts and the jaw assemblies. A belleville washer at one end of the drive shaft and thrust bearings at both drive shaft ends hold the shaft in compression between the vise bed, thereby preventing wobble of the jaw assemblies due to wear between the shaft and vise bed. NASA



N82-29605*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DIRECTIONAL GEAR RATIO TRANSMISSION Patent Application
Alan E. LeFever, inventor (to NASA) (Rockwell International Corp., Downey, Calif.) Filed 11 Jun. 1982 15 p Sponsored by NASA
(NASA-Case-LAR-12644-1; US-Patent-Appl-SN-387728) Avail: NTIS HC A02/MF A01 CSCL 13I

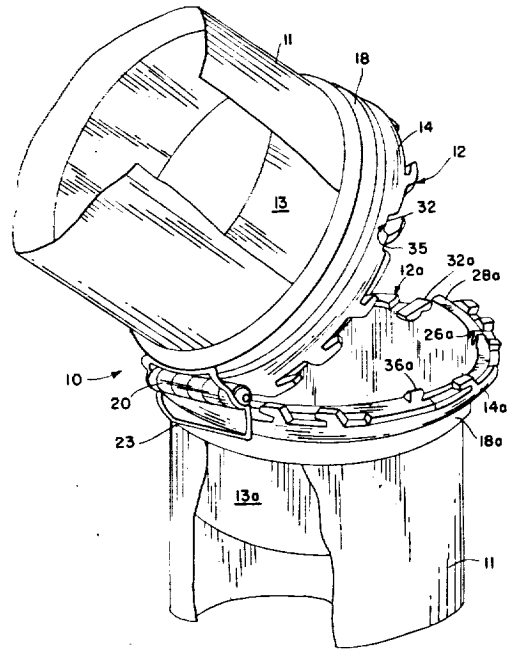
Epicyclic gear transmissions which transmit output at a gear ratio dependent only upon the input's direction are considered. A transmission housing envelops two epicyclic gear assemblies, and has shafts extending from it. One shaft is attached to a sun gear within the first epicyclic gear assembly. Planet gears are held symmetrically about the sun gear by a planet gear carrier and are in mesh with both the sun gear and a ring gear. Two unidirectional clutches restrict rotation of the first planet gear carrier and ring gear to one direction. A connecting shaft drives a second sun gear at the same speed and direction as the first planet gear carrier while a connecting portion drives a second planet gear carrier at the same speed and direction as the first ring gear. The transmission's output is then transmitted by the second ring gear to the second shaft. Input is transmitted at a higher gear ratio and lower speed for all inputs in the first direction than in the opposite direction. NASA



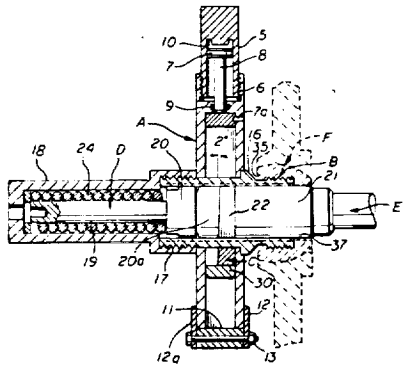
N82-29606*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SELF-LOCKING MECHANICAL CENTER JOINT Patent Application
Harold G. Bush and Richard E. Wallsom, inventors (to NASA) (Kentron International, Inc., Hampton, Va.) Filed 11 Jun. 1982 16 p
(NASA-Case-LAR-12864-1; US-Patent-Appl-SN-387646) Avail: NTIS HC A02/MF A01 CSCL 13I

A device for connecting, rotating and locking together a pair of structural half-columns is described. The present embodiment comprises a pair of cylindrical hub assemblies connected at their inner faces by a spring loaded hinge; each hub assembly as a structural half column attached to its outer end. Each hub assembly includes a cylindrical hub and a locking ring moveably attached around the hub's hinged end. Each locking ring has a plurality of 'L' shaped teeth projecting outward perpendicularly from its circumference and is attached around the hub subject to the force of a spring connected to both the ring and hub. Each cylindrical hub has a latch mechanism for holding each locking ring in a rotated position against the force of the spring and a hammer mechanism for disenagaging the latch mechanism on the opposing hub when the hubs are rotated

together. The structural half columns connected to the hinged pair of hub assemblies are stored so that the hub assemblies are rotated away from each other and are subject to the force of their spring loaded hinge. NASA



sleeve and the slider driven home with its slots latched against the slider rails and firmly held there by a compression spring and follower is cover threadedly attached to the sleeve as the basic load carrying and releasing elements. NASA



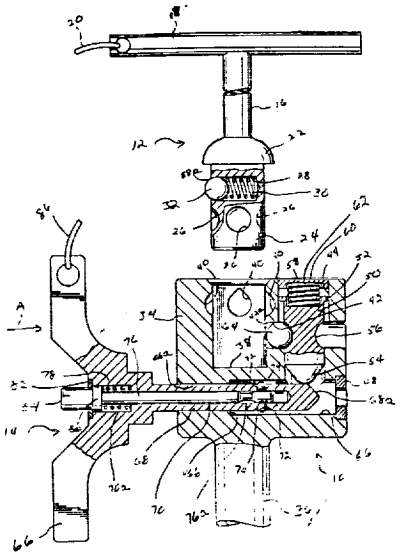
N82-31688*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SLIDE RELEASE MECHANISM Patent Application
James W. Bunker (TransTechnology Corp., Canyon Country, Calif.) and Robert S. Ritchie, inventors (to NASA) (TransTechnology Corp., Canyon Country, Calif.) Filed 30 Jun. 1982 13 p Sponsored by NASA
(NASA-Case-MSC-20080-1; US-Patent-Appl-SN-393584) Avail: NTIS HC A02/MF A01 CSCL 13I

An explosive type disconnect device in which the force activating the device is at 90 deg to the load axis is described. This device will be used to separate the external tank starting with STS-10. The disconnect device consists mainly of a box shaped body, a guide sleeve, a slider latch, a load carrying shank, and the follower. The overall organization is illustrated. To assemble the device, the attenuator is slipped over the end of slider and the assembly is positioned in the open end of the body. The aperture in the slider is aligned with opposed apertures in the body and the sleeve is slipped through the apertures until its collar abuts the body. By rotating the sleeve until its webs line up with slider slot, the slider can be moved into the body capturing the sleeve. The shank can then be slipped loosely through the

N82-31689*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
CONNECTION SYSTEM Patent Application
Bruce McCandless, II, inventor (to NASA) Filed 30 Jun. 1982 20 p
(NASA-Case-MSC-20319-1; US-Patent-Appl-SN-393582) Avail: NTIS HC A02/MF A01 CSCL 13I

The instant invention relates to a connection system applicable to composite tools, such as a socket and wrench handle, where the interconnected parts move relative to one another is described. Means are provided for positive control over each component part of the assembly, to prevent dropping or loss of a component part during use. This is of great importance in certain circumstances such as extravehicular activities in space, subsurface marine operations, or where dropping or loss of a component part could damage machinery or endanger personnel. The connection system comprises a receptable in one component of the tool, and a pin on the other component matably receivable in the receptacle. A primary latch engages to retain pin in the receptacle. A lock member

on the component is operably associated with the latch to selectively maintain its engagement or permit its release by operation of an actuator which is selectably insertable into the component. NASA

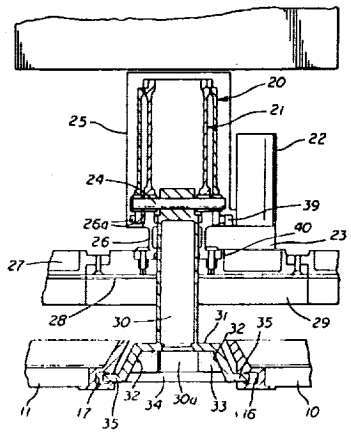


N82-31690*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

CAM CONTROLLED RETRACTABLE DOOR LATCH Patent Application

Renton B. Carsley, inventor (to NASA) (Rockwell International Corp., Pittsburgh) 30 Jun. 1982 11 p Sponsored by NASA (NASA-Case-MSC-20304-1; US-Patent-Appl-SN-393585) Avail: NTIS HC A02/MF A01 CSCL 13I

A latching mechanism in which there is linear movement and rotational movement is described. The umbilical doors of the space shuttle orbiter are required to be open during vehicle launch. After the external tank is released, the doors are closed. Presently, the device for maintaining the doors in an open position is mounted on the external tank and therefore has a single mission life. The latching mechanism of the invention is mounted in the orbiter and therefore is returned and has multimission capability. The latching mechanism is comprised of a pair of concentric nested, cylindrical cams and motors to actuate the cams, and latch pin all contained within a cover mounted on a support bracket carried by the substructure. A shaft having a latch pin is mounted inside the inner cylindrical cam. NASA



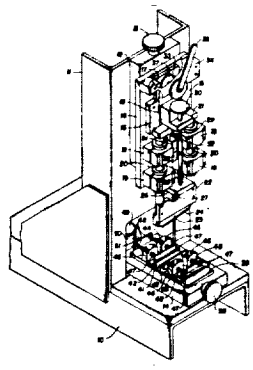
N82-32730* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

CRYSTAL CLEAVING MACHINE Patent

Frederick C. Hallberg and John S. J. Benedicto, inventors (to NASA) Issued 10 Aug. 1982 7 p Filed 29 Aug. 1980 Supersedes N80-32246 (18 - 22, p 3071)
(NASA-Case-GSC-12584-1; US-Patent-4,343,287; US-Patent-Appl-SN-182879; US-Patent-Class-125-23R; US-Patent-Class-225-103) Avail: US Patent and Trademark Office CSCL 13I

A machine is disclosed for cleaving hard crystals. A typical example of which is lithium fluoride, with precision and uniformity and includes vertical axis positioning control means for an adjustable spring tension guided hammer mechanism employed to strike an anvil. A crystal cleaving shock wave transmitted to a cleaving blade is generated having an angulated cleaving edge in contact with one corner of the crystal. Connection between the anvil and the blade is by means of a pair of vertical shafts held in substantially friction free engagement by two pairs of adjustable linear bearings. An underlying crystal holding fixture with horizontal position control means includes a zero reference stop face for the crystal and opposing spring-loaded clamping and vertical positioning elements which are precisely guided.

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



N82-32731* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

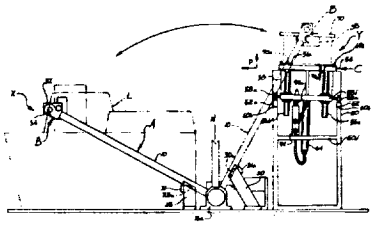
APPARATUS FOR SEQUENTIALLY TRANSPORTING CONTAINERS Patent

Jerry L. Hudgins, inventor (to NASA) Issued 10 Aug. 1982 9 p Filed 11 Jul. 1980 Supersedes N80-29704 (18 - 20, p 2709)
(NASA-Case-MFS-23846-1; US-Patent-4,343,584; US-Patent-Appl-SN-168944; US-Patent-Class-414-222; US-Patent-Class-414-226; US-Patent-Class-414-739; US-Patent-Class-294-116) Avail: US Patent and Trademark Office CSCL 13I

Apparatus for transferring and manipulating a plurality of containers in a sequence is disclosed including a mechanical manipulator arm having a gripping device which automatically picks up a container at a fixed pickup position P and transfers it to a processing station. At a processing station X, the container is loaded with silicon wafers and thereafter returned by the arm to the fixed position P at the pickup and return station Y. A plurality of the containers may be processed in sequence from the fixed pickup position by providing a movable carriage upon which container pedestal platforms are supported, at least one of which

is an elevator platform. The platforms include abutments for properly positioning the containers for accurate pickup by the manipulator arm.

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



N82-32732* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

MECHANICAL END JOINT SYSTEM FOR STRUCTURAL COLUMN ELEMENTS Patent

Harold G. Bush (Vought Corp., Hampton, Va.) and Richard E. Wallsom, inventors (to NASA) (Vought Corp., Hampton, Va.) Issued 20 Jul. 1982 9 p Filed 5 Dec. 1979 Supersedes N80-22704 (18 - 13, p 1719)

(NASA-Case-LAR-12482-1; US-Patent-4,340,318; US-Patent-Appl-SN-100611; US-Patent-Class-403-217; US-Patent-Class-403-317; US-Patent-Class-403-331; US-Patent-Class-403-340; US-Patent-Class-52-81) Avail: US Patent and Trademark Office CSCL 13I

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

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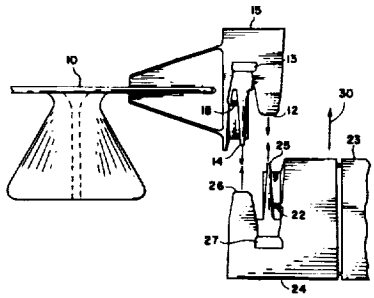


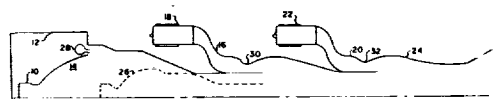
N82-33712*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

DIFFUSER/EJECTOR SYSTEM FOR A VERY HIGH VACUUM ENVIRONMENT Patent Application

Kenneth E. Riggs and Carl J. Wojciechowski, inventors (to NASA) (Lockheed Missiles and Space Co., Huntsville, Ala.) Filed 19 Aug. 1982 18 p

(NASA-Case-MFS-15791-1; US-Patent-Appl-SN-409678) Avail: NTIS HC A02/MF A01 CSCL 13I

Turbo jet engines are used to furnish the necessary high temperature, high volume medium pressure gas to provide a high vacuum test environment at comparatively low cost for space engines at sea level. Moreover, the invention provides a unique way by use of the variable area ratio ejectors with a pair of meshing cones are used. The outer cone is arranged to translate fore and aft, and the inner cone is interchangeable with other cones having varying angles of taper. NASA



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.*

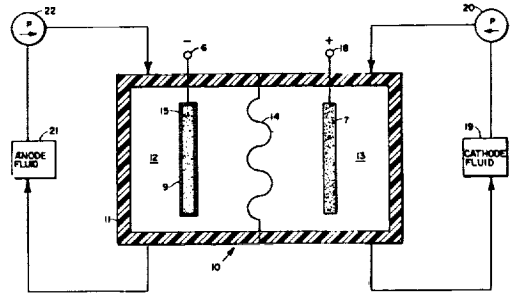
N82-22672*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

IMPROVED CHROMIUM ELECTRODES FOR REDOX CELLS Patent Application

Vinod Jalan (Giner, Inc.), Margaret A. Reid, and Jo Ann Charleston, inventors (to NASA) Filed 26 Feb. 1982 13 p

(NASA-Case-LEW-13653-1; US-Patent-Appl-SN-352821) Avail: NTIS HC A02/MF A01 CSCL 10C

An improved electrode having a gold coating for use in the anode compartment of a REDOX cell is described. The anode fluid utilizes a chromic/chromous couple. A carbon felt is soaked in methanol, rinsed in water, dried and then heated in KOH after which it is again washed in deionized water and dried. The felt is then moistened with a methanol water solution containing chloroauric acid and is stored in a dark place while still in contact with the gold-containing solution. After all the gold-containing solution is absorbed in the felt, the latter is dried by heat and then heat treated at a substantially greater temperature. The felt is then suitable for use as an electrode and is wetted with water or up to two molar HCl prior to installation in a REDOX cell. The novelty of the invention lies in the use of KOH for cleaning the felt and the use of alcohol as a carrier for the gold together with the heat treating procedure. NASA



N82-22673*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

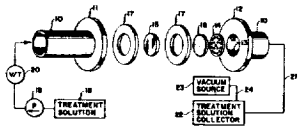
LIGHT WEIGHT NICKEL BATTERY PLAQUE Patent Application

M. A. Reid, R. E. Post, and D. G. Soltis, inventors (to NASA) Filed 19 Feb. 1982 9 p

(NASA-Case-LEW-13349-1; US-Patent-Appl-SN-350476) Avail: NTIS HC A02/MF A01 CSCL 10C

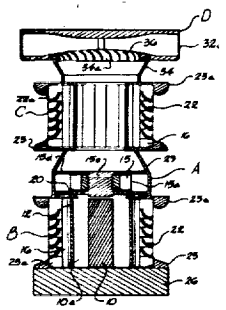
Fabrication of a nickel plaque which may be coated with another suitable metal or compound to form an electrode for

use in a fuel cell or battery is described. A flexible, porous, platable, plastic substrate is positioned against a diffuser together with an apertured support plate in a conduit. Flanges are clamped together on gaskets which prevent leakage of fluid from the conduit for bypassing of the substrate by the fluid. Treatment solutions are directed under pressure from a container by a pump through the substrate, diffuser and apertured support to a treatment solution collector. The treatment solutions are first a sensitizer, then distilled water, a catalyst solution, distilled water and, lastly, a nickel plating bath solution. T.M.



N82-24639* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AMPLIFIED WIND TURBINE APPARATUS Patent
Leopold A. Hein and William N. Myers, inventors (to NASA) Issued 5 Jan. 1982 8 p Filed 12 Mar. 1980 Supersedes N80-21831 (18 - 12, p 1597)
(NASA-Case-MFS-23830-1; US-Patent-4,309,146; US-Patent-Appl-SN-129780; US-Patent-Class-415-2R; US-Patent-Class-415-DIG.8) Avail: US Patent and Trademark Office CSCL 10B

An invention related to the utilization of wind energy and increasing the effects thereof for power generation is described. Amplified wind turbine apparatus is disclosed wherein ambient inlet air is prerotated in a first air rotation chamber having a high pressure profile increasing the turbulence and Reynolds number thereof. A second rotation chamber adjacent and downstream of the turbine has a low pressure core profile whereby flow across the turbine is accelerated and thereafter exits the turbine apparatus through a draft anti-interference device. Interference with ambient winds at the outlet of the turbine apparatus is thus eliminated. Pivotable vanes controlled in response to prevailing wind direction admit air to the chambers and aid in imparting rotation. A central core may be utilized for creating the desired pressure profile in the chamber. M.D.K.



N82-24640* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SOLAR ENGINE Patent
Ronald N. Jensen, inventor (to NASA) Issued 27 Apr. 1981 6 p Filed 22 Jun. 1979 Supersedes N79-29608 (17 - 20, p 2692)
(NASA-Case-LAR-12148-1; US-Patent-4,326,381; US-Patent-Appl-SN-051275; US-Patent-Class-60-641.14; US-Patent-Class-60-516) Avail: US Patent and Trademark Office CSCL 10B

A solar engine is disclosed in which a fluid, which is first heated and then cooled, forces a piston outward as the fluid is heated, and then draws the piston inward as the fluid is cooled. The piston is connected to a shaft and produces work as it moves outward and inward. A displacer plate moves between an absorber plate and a cooling plate to form an air space between the displacer and one or the other of these two plates for heating and cooling the fluid. The displacer plate is moved from one plate to the other by the displacer push ring as the piston nears the midpoint of its travel on the outward stroke and again on the inward stroke.

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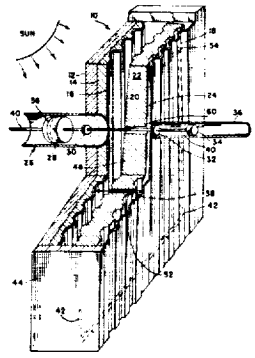

N82-24641* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PROCESS OF TREATING CELLULOSIC MEMBRANE AND ALKALINE WITH MEMBRANE SEPARATOR Patent
Howard Eugene Hoyt (Borden, Inc., New York) and Helmuth Louis Pfluger, inventors (to NASA) (Borden, Inc., New York) Issued 3 Mar. 1970 3 p Filed 2 Nov. 1967 Sponsored by NASA (NASA-Case-GSC-10019-1; US-Patent-3,498,841; US-Patent-Appl-SN-680048; US-Patent-Class-136-6) Avail: US Patent and Trademark Office CSCL 10C

The improvement of water-soluble cellulose ether membranes for use as separators in concentrated alkaline battery cells is discussed. The process of contacting membranes with an aqueous alkali solution of concentration less than that of the alkali solution to be used in the battery but above that at which the membrane is soluble is described.

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

N82-24642* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SEPARATOR FOR ALKALINE BATTERIES AND METHOD OF MAKING SAME Patent
Howard Eugene Hoyt (Borden, Inc., New York) and Helmuth Louis Pfluger, inventors (to NASA) (Borden, Inc. New York) Issued 3 Mar. 1970 3 p Filed 2 Nov. 1967 Sponsored by NASA (NASA-Case-GSC-10350-1; US-Patent-3,498,840; US-Patent-Appl-SN-679980; US-Patent-Class-136-6) Avail: US Patent and Trademark Office CSCL 10C

The preparation of membanes suitable for use as separators in concentrated alkaline battery cells by selective solvolysis of copolymers of methacrylate esters with acrylate esters followed by addition of a base and to the resultant products is described. The method of making copolymers by first copolymerizing a methacrylate ester (or esters) with a more readily hydrolyzable ester, followed by a selective saponification whereby the methacrylate ester moieties remain essentially intact and the readily hydrolyzable ester moiety is suponified and to the partial or complete neutralization of the relatively brittle copolymer acid with a base to make membranes which are sufficiently flexible in the dry state so that they may be wrapped around electrodes without damage by handling is described.

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

N82-24643* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SEPARATOR FOR ALKALINE ELECTRIC CELLS AND METHOD OF MAKING Patent
Helmuth Louis Pfluger (Borden, Inc., New York) and Howard Eugene Hoyt, inventors (to NASA) (Borden, Inc., New York) Issued 7 Jul. 1970 3 p Filed 2 Nov. 1967 Sponsored by NASA (NASA-Case-GSC-10017-1; US-Patent-3,519,484; US-Patent-Appl-SN-679996; US-Patent-Class-136-6) Avail: US Patent and Trademark Office CSCL 10A

Modified cellulose ether films having an increased electrolytic conductivity and a useable flexibility and in certain instances an increased flexibility are presented. Battery separator membranes comprising a cellulose ether and a minor proportion of a compatible water soluble base selected from the group consisting of alkali metal and ammonium hydroxides, aliphatic amines, and aliphatic hydroxyamines are used.

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

N82-24644* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SEPARATOR FOR ALKALINE ELECTRIC BATTERIES AND METHOD OF MAKING Patent
Helmuth Louis Pfluger (Xorden, Inc., New York) and Howard Eugene Hoyt, inventors (to NASA) (Borden, Inc., New York) Issued 7 Jul. 1970 3 p Filed 2 Nov. 1967 Sponsored by NASA (NASA-Case-GSC-10018-1; US-Patent-3,519,483; US-Patent-Appl-SN-679987; US-Patent-Class-136-6) Avail: US Patent and Trademark Office CSCL 10C

Battery separator membranes of high electrolytic conductivity comprising a cellulose ether and a compatible metallic salt of water soluble aliphatic acids and their hydroxy derivatives are described. It was found that methyl cellulose can be modified by another class of materials, nonpolymeric in nature, to form battery separator membranes of low electrolytic resistance but which have the flexibility of membranes made of unmodified methyl cellulose, and which in many cases enhance flexibility over membranes made with unmodified methyl cellulose. Separator membranes for electrochemical cells comprising a cellulose ether and a modified selected from the group consisting of metallic salts of water soluble alphatic acids and their hydroxy derivatives and to electrochemical cells utilizing said membranes are described.

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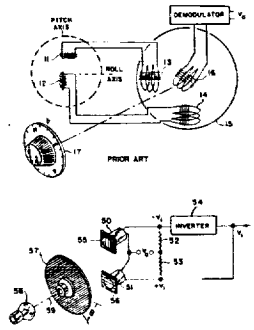
N82-24645* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ALKALINE ELECTROCHEMICAL CELLS AND METHOD OF MAKING Patent
Howard Eugene Hoyt (Borden, Inc., New York) and Helmuth Louis Pfluger, inventors (to NASA) (Borden, Inc., New York) Issued 14 Apr. 1970 3 p Filed 8 Aug. 1967 (NASA-Case-GSC-10349-1; US-Patent-3,506,496; US-Patent-Appl-SN-658999; US-Patent-Class-136-148) Avail: US Patent and Trademark Office CSCL 10C

Equilibrated cellulose ether membranes of increased electrolytic conductivity for use as separators in concentrated alkaline electrochemical cells are investigated. The method of making such membranes by equilibration to the degree desired in an aqueous alkali solution mantained at a temperature below about 10 C is described.

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

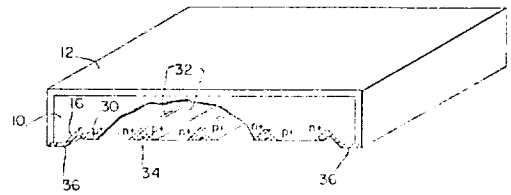
N82-24716*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MAGNETIC HEADING REFERENCE Patent Application
H. Douglas Garner, inventor (to NASA) Filed 9 Apr. 1982 20 p
(NASA-Case-LAR-12638-1; US-Patent-Appl-SN-367187) Avail: NTIS HC A02/MF A01 CSCL 10C

A device for generating a signal indicative of the difference between the actual heading and the selected heading of a vehicle was invented. Magnetometers, demodulators, inventors, a calibrated dial, a mechanical sine/cosine mechanism, a polarized light resolver, and a printed circuit resolver comprise the principal components. N.W.



N82-24717*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HIGH VOLTAGE V-GROOVE SOLAR CELL Patent Application
J. C. Evans, Jr., A. T. Chai, and C. P. Goradia, inventors (to NASA) Filed 18 Mar. 1982 11 p
(NASA-Case-LEW-13401-2; US-Patent-Appl-SN-359388) Avail: NTIS HC A02/MF A01 CSCL 10A

A high voltage multijunction solar cell is disclosed. The cell is composed of a plurality of discrete voltage generating regions, or unit cells, which are formed in a single semiconductor wafer and are connected together so that the voltages of the individual cells are additive. The unit cells comprise doped regions of opposite conductivity types separated by a gap. V-shaped grooves are formed in the wafer and thereafter the wafer is oriented so that ions of one conductivity type can be implanted in one face of the groove while the other face is shielded. A metallization layer is applied and selectively etched away to provide connections between the unit cells: NASA



N82-26776* National Aeronautics and Space Administration. Pasadena Office, Calif.
AUTOMOTIVE ABSORPTION AIR CONDITIONER UTILIZING SOLAR AND MOTOR WASTE HEAT Patent
Zenon Popinski, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 29 Dec. 1981 6 p Filed 30 Jul. 1980 Supersedes N80-29843 (18 - 20, p 2726) Sponsored by NASA
(NASA-Case-NPO-15183-1; US-Patent-4,307,575; US-Patent-Appl-SN-173519; US-Patent-Class-62-148; US-Patent-Class-62-235.1; US-Patent-Class-62-238.3; US-Patent-Class-62-239; US-Patent-Class-62-244; US-Patent-Class-62-476) Avail: US Patent and Trademark Office CSCL 10A

In combination with the ground vehicles powered by a waste heat generating electric motor, a cooling system including a generator for driving off refrigerant vapor from a strong refrigerant absorbant solution is described. A solar collector, an air-cooled condenser connected with the generator for converting the

refrigerant vapor to its liquid state, an air cooled evaporator connected with the condenser for returning the liquid refrigerant to its vapor state, and an absorber is connected to the generator and to the evaporator for dissolving the refrigant vapor in the weak refrigerant absorbant solution, for providing a strong refrigerant solution. A pump is used to establish a pressurized flow of strong refrigerant absorbant solution from the absorber through the electric motor, and to the collector.

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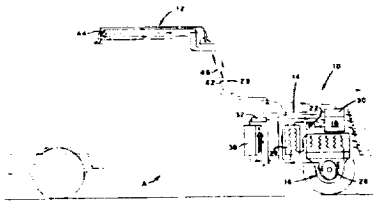

N82-26777* National Aeronautics and Space Administration. Pasadena Office, Calif.

EFFICIENCY OF SILICON SOLAR CELLS CONTAINING CHROMIUM Patent

Amal M. Salama, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 19 Jan. 1982 8 p Filed 11 Sep. 1980 Supersedes N80-32850 (18 - 23, p 3156) Sponsored by NASA

(NASA-Case-NPO-15179-1; US-Patent-4,311,870; US-Patent-Appl-SN-185867; US-Patent-Class-136-261; US-Patent-Class-136-290; US-Patent-Class-148-1.5; US-Patent-Class-357-30; US-Patent-Class-357-63; US-Patent-Class-219-121LN) Avail: US Patent and Trademark Office CSCL 10A

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

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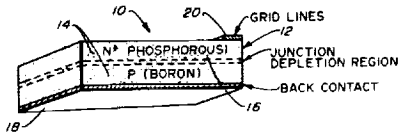


N82-26779*# National Aeronautics and Space Administration. Pasadena Office, Calif.

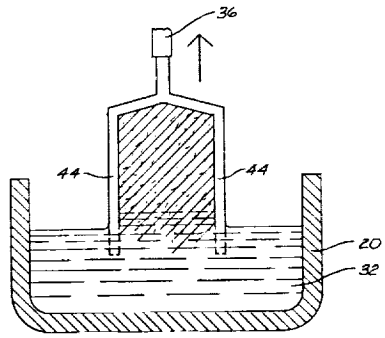
PROCESS AND APPARATUS FOR GROWING A CRYSTAL RIBBON Patent Application

Jay W. Thornhill, inventor (to NASA) (JPL, Pasadena, Calif.) Filed 23 Apr. 1982 32 p

(Contract NAS7-100)

(NASA-Case-NPO-15629-1; US-Patent-Appl-SN-371351) Avail: NTIS HC A03/MF A01 CSCL 10A

A low cost process for growing crystalline ribbons of silicon which are well suited for use in photovoltaic cells and operate at a relatively high rate of efficiency was developed. Two edge defining members are stationarily mounted relative to a container and to each other and are partially submerged in the molten silicon held in the container. the fixedly mounted edge defining members break the surface of the melt at a predetermined distance from each other. The predetermined distance substantially corresponds to the width of the crystal ribbon to be grown. The edge defining members are made of a material such as quartz or graphite, which is wettable by molten silicon. NASA

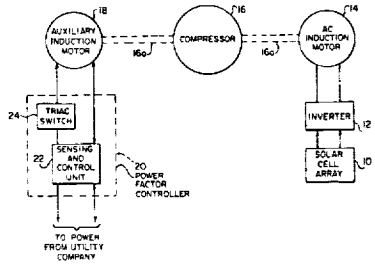


N82-26780*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SOLAR POWERED ACTUATOR WITH CONTINUOUSLY VARIABLE AUXILIARY POWER CONTROL Patent Application

Frank J. Nola, inventor (to NASA) Filed 6 May 1982 12 p (NASA-Case-MFS-25637-1; US-Patent-Appl-SN-375684) Avail: NTIS HC A02/MF A01 CSCL 10A

A solar powered system in which a load such as a compressor is driven by a main induction motor powered by a solar array, and an auxilliary motor shares the load with the solar powered motor in proportion to the amount of sunlight available is provided with a powered factor controller for regulating voltage applied to the auxilliary motor in accordance with the loading on that motor. In one embodiment, when sufficient power is available from the solar cell array, the auxilliary motor is driven as a generator by excess power from the main motor so as to return electrical energy to the power company utility lines. NASA



N82-28780* National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD OF FABRICATING SCHOTTKY BARRIER SOLAR CELL Patent

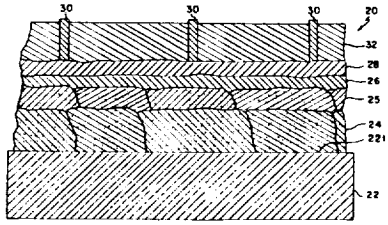
Richard J. Stirn (JPL, California Inst. of Tech., Pasadena) and Yea-Chuan M. Yeh, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 23 Mar. 1982 11 p Filed 16 Jan. 1981 Supersedes N81-26553 (19 - 17, p 2360)

(NASA-Case-NPO-13689-4; US-Patent-4,321,099; US-Patent-4,278,830; US-Patent-Appl-SN-225501; US-Patent-Appl-SN-93714, US-Patent-Appl-SN-837513; US-Patent-Appl-SN-683073; US-Patent-Appl-SN-597430; US-Patent-Class-148-175; US-Patent-Class-29-572; US-Patent-Class-427-531; US-Patent-Class-427-74) Avail: US Patent and Trademark Office CSCL 10A

On a thin substrate of low cost material with at least the top surface of the substrate being electrically conductive is deposited a thin layer of heavily doped n-type polycrystalline

germanium, with crystalline sizes in the submicron range. A passivation layer may be deposited on the substrate to prevent migration of impurities into the polycrystalline germanium. The polycrystalline germanium is recrystallized to increase the crystal sizes in the germanium layer to not less than 5 micros to serve as a base layer on which a thin layer of gallium arsenide is vapor epitaxially grown to a selected thickness. A thermally-grown oxide layer of a thickness of several tens of angstroms is formed on the gallium arsenide layer. A metal layer, of not more about 100 angstroms thick, is deposited on the oxide layer, and a grid electrode is deposited to be in electrical contact with the top surface of the metal layer. An antireflection coating may be deposited on the exposed top surface of the metal layer.

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



N82-28784*# National Aeronautics and Space Administration. Pasadena Office, Calif.

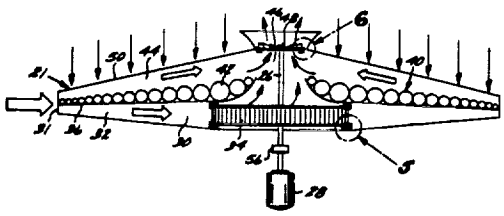
WIND AND SOLAR POWERED TURBINE Patent Application

Ivan D. Wells (JPL), Jin L. Koh (JPL), and Marvin Holmes, inventors (to NASA) (JPL) Filed 19 May 1982 24 p

(Contract NAS7-100)

(NASA-Case-NPO-15496-1; US-Patent-Appl-SN-379602) Avail: NTIS HC A02/MF A01 CSCL 10A

An efficient, cost effective wind and solar driven power generating station is described. It is well adapted for satisfying the electrical power requirements of a relatively small community located in a geographic area having favorable climatic conditions for solar and wind driven power generation. The disc shaped structure is mounted in an elevated position relative to the ground to expose it to the prevailing wind and solar radiation. The structure includes a first plurality of radially extending air passages which direct ambient wind to a radial flow turbine located in an opening in the center of the structure. A solar radiation absorbing surface which has black bodies is disposed over the first plurality of air passages. NASA



N82-28785*# National Aeronautics and Space Administration. Pasadena Office, Calif.

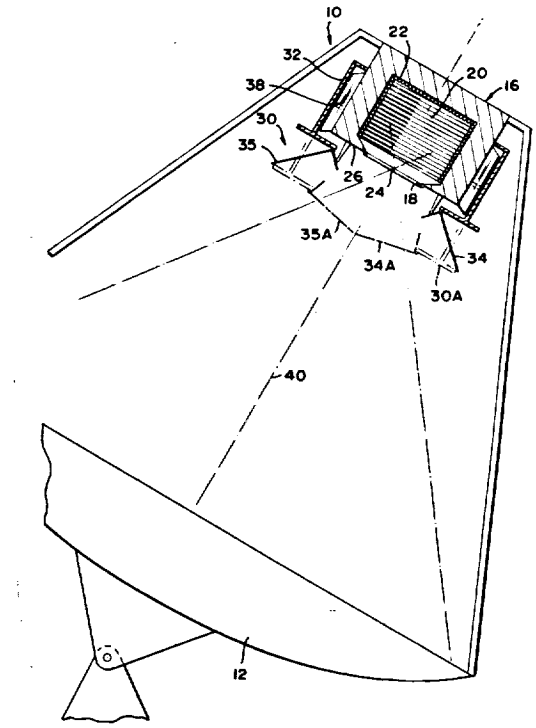
SOLAR CONCENTRATOR PROTECTIVE SYSTEM Patent Application

M. Kudrek Selcuk, inventor (to NASA) (JPL) Filed 25 Jun. 1982 15 p

(Contract NAS7-100)

(NASA-Case-NPO-15662-1; US-Patent-Appl-SN-392103) Avail: NTIS HC A02/MF A01 CSCL 10A

A mechanism that blocks concentrated sunlight from reaching a receiver, in the event of a tracking failure or loss of coolant is described. Sunlight is normally concentrated by a dish reflector onto the opening of a receiver. A faceplate surrounds the opening, and coolant carrying tubes, line the receiver. If the concentrated sunlight wanders so it begins to fall on the faceplate, then the sunlight will melt a portion of a fuse wire and break the wire. Similarly, if there is no coolant in tubes, the wire portion will break. The wire is attached to a flange on a shutter frame, and breaking of the fuse wire allows the frame to fall. Normally, the shutter frame supports shutter elements that are held open by cam followers that bear against cams. NASA



N82-29708* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ADVANCED INORGANIC SEPARATORS FOR ALKALINE BATTERIES Patent

Dean W. Sheibley, inventor (to NASA) Issued 25 May 1982 5 p Filed 27 Feb. 1981 Supersedes N81-22466 (19 - 13, p 1777)

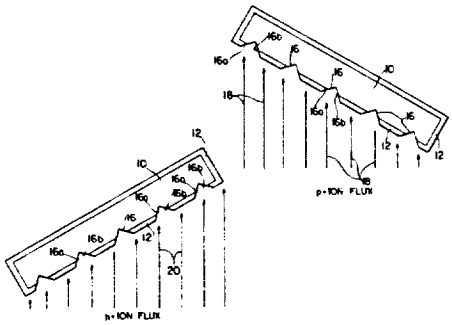
(NASA-Case-LEW-13171-1; US-Patent-4,331,746; US-Patent-Appl-SN-238790; US-Patent-Class-429-144; US-Patent-Class-429-251; US-Patent-Class-429-254) Avail: US Patent and Trademark Office CSCL 10C

A flexible, porous battery separator comprising a coating applied to a porous, flexible substrate is described. The coating comprises: (1) a thermoplastic rubber-based resin which is insoluble and unreactive in the alkaline electrolyte; (2) a polar organic plasticizer which is reactive with the alkaline electrolyte to produce a reaction product which contains a hydroxyl group and/or a carboxylic acid group; and (3) a mixture of polar particulate filler materials which are unreactive with the electrolyte, the mixture comprising at least one first filler material having a surface area of greater than 25 meters sq/gram, at least one second filler material having a surface area of 10 to 25 sq meters/gram, wherein the volume of the mixture of filler materials is less than 45% of the total volume of the fillers and the binder, the filler surface area per gram of binder is about 20 to 60 sq meters/gram, and the amount of plasticizer is sufficient to coat each filler particle. A method of forming the battery separator is also described.

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

N82-29709* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD OF MAKING A HIGH VOLTAGE V-GROOVE SOLAR CELL Patent
John C. Evans, Jr., An-Ti Chai, and Chandra P. Goradia, inventors (to NASA) Issued 22 Jun. 1982 6 p. Filed 24 Dec. 1980 Supersedes N81-16529 (19 - 07, p 0927)
(NASA-Case-LEW-13401-1; US-Patent-4,335,503; US-Patent-Appl-SN-219678; US-Patent-Class-29-572; US-Patent-Class-136-249; US-Patent-Class-148-1.5; US-Patent-Class-357-30) Avail: US Patent and Trademark Office CSCL 10A

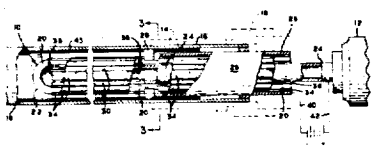
A method is provided for making a high voltage multijunction solar cell. The cell comprises a plurality of discrete voltage generating regions, or unit cells, which are formed in a single semiconductor wafer and are connected together so that the voltages of the individual cells are additive. The unit cells comprise doped regions of opposite conductivity types separated by a gap. The method includes forming V-shaped grooves in the wafer and thereafter orienting the wafer so that ions of one conductivity type can be implanted in one face of the groove while the other face is shielded. A metallization layer is applied and selectively etched away to provide connections between the unit cells. Official Gazette of the U.S. Patent and Trademark Office



N82-29710* National Aeronautics and Space Administration. Pasadena Office, Calif.
SOLID ELECTROLYTE CELL Patent
Robert Richter, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 25 May 1982 6 p. Filed 24 Dec. 1980 Supersedes N81-16385 (19 - 07, p 0907) Sponsored by NASA
(NASA-Case-NPO-15269-1; US-Patent-4,331,742; US-Patent-Appl-SN-220214; US-Patent-Class-429-33; US-Patent-Class-429-40; US-Patent-Class-429-193; US-Patent-Class-204-290R; US-Patent-Class-204-290F) Avail: US Patent and Trademark Office CSCL 10C

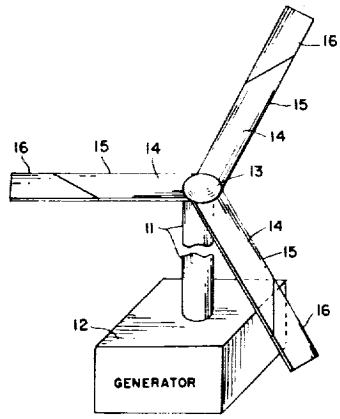
A solid electrolyte cell including a body of solid ionized gas-conductive electrolyte having mutually spaced surfaces and on which is deposited a multiplicity of mutually spaced electrodes is described. Strips and of bare substances are interposed between electrodes, so that currents of ionic gas may be established between the electrodes via the bare strips, whereby electrical resistance for the cells is lowered and the gas conductivity is enhanced.

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



N82-29713*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
VERTICAL SHAFT WINDMILL Patent Application
David C. Grana and Spencer V. Inge, Jr., inventors (to NASA) Filed 28 May 1982 8 p
(NASA-Case-LAR-12923-1; US-Patent-Appl-SN-383063) Avail: NTIS HC A02/MF A01 CSCL 10A

A vertical shaft windmill that automatically controls its maximum rotational speed in high winds is disclosed. Several equally spaced blades are mounted on the vertical shaft. Each blade consists of an inboard section attached to the shaft and an outboard section skew hinged to the inboard section. The outboard sections automatically adjust their positions with respect to the fixed inboard sections with changes in velocity of the relative wind. When the wind reaches a certain velocity the inboard sections and the outboard sections form flat surfaces. Hence, any further increase in the wind velocity will not increase the rotational speed of the shaft. With the outboard sections in downward positions any abrupt changes in wind will move most of the outboard sections upward releasing part of the load and protecting the windmill. NASA



N82-29714*# National Aeronautics and Space Administration. Pasadena Office, Calif.
SALTLESS SOLAR POND Patent Application
Edward I. H. Lin, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 28 May 1982 24 p
(Contract NAS7-100)
(NASA-Case-NPO-15808-1; US-Patent-Appl-SN-383068) Avail: NTIS HC A02/MF A01 CSCL 10A

A specifically-designed honeycomb structure is placed on the surface permits penetration of short wave solar radiation into the water, but efficiently insulates the resulting heated body of water from losing heat to the atmosphere by conduction, convection or infrared radiation. The honeycomb structure includes several honeycomb panels which are mounted adjacent to one another in a modular fashion to float on the surface of the water. Each honeycomb panel includes a multitude of honeycomb cells having a height-to-width or aspect ratio of at least approximately 14 to 1. The honeycomb cells effectively suppress convection of air in the panels. A radiation shield, comprising a cross-plate mounted substantially in the midsection of each cell, significantly reduces heat losses by infrared radiation. NASA

N82-31764* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

HIGH VOLTAGE PLANAR MULTIJUNCTION SOLAR CELL Patent

John C. Evans, Jr., An-Ti Chai, and Chandra P. Goradia, inventors (to NASA) Issued 24 Dec. 1980 6 p Filed 24 Dec. 1980 Supersedes N81-16528 (19 - 07, p 0927)
(NASA-Case-LEW-13400-1; US-Patent-4,341,918; US-Patent-Appl-SN-219677; US-Patent-Class-136-249; US-Patent-Class-357-30) Avail: US Patent and Trademark Office CSCL 10A

A high voltage multijunction solar cell is provided wherein a plurality of discrete voltage generating regions or unit cells are formed in a single generally planar semiconductor body. The unit cells are comprised of doped regions of opposite conductivity type separated by a gap or undiffused region. Metal contacts connect adjacent cells together in series so that the output voltages of the individual cells are additive. In some embodiments, doped field regions separated by a overlie the unit cells but the cells may be formed in both faces of the wafer.

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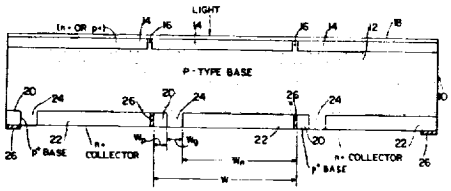


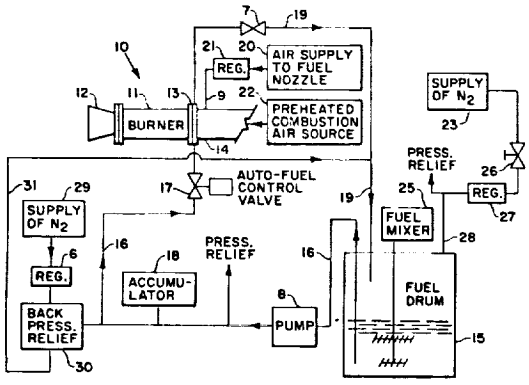
N82-31769*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

MICRONIZED COAL BURNER FACILITY Patent Application

F. D. Calfo and M. W. Lupton, inventors (to NASA) Filed 30 Jun. 1982 13 p
(NASA-Case-LEW-13426-1; US-Patent-Appl-SN-393588) Avail: NTIS HC A02/MF A01 CSCL 10B

A combustor or burner system in which the ash resulting from burning a coal in oil mixture is of submicron particle size is described. The burner system comprises a burner section, a flame exit nozzle, a fuel nozzle section, and an air tube by which preheated air is directed into the burner section. Regulated air pressure is delivered to a fuel nozzle. Means are provided for directing a mixture of coal particles and oil from a drum to a nozzle at a desired rate and pressure while means returns excess fuel to the fuel drum.

Author



N82-32841* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PHOTOCAPACITIVE IMAGE CONVERTER Patent

William E. Miller, Arden Sher, and Yuan H. Tsuo, inventors (to NASA) Issued 25 May 1982 7 p Filed 20 Jun. 1980 Supersedes N80-28635 (18 - 19, p 2562)
(NASA-Case-LAR-12513-1; US-Patent-4,331,873; US-Patent-Appl-SN-161256; US-Patent-Class-250-330; US-Patent-Class-250-370) Avail: US Patent and Trademark Office CSCL 10A

An apparatus for converting a radiant energy image into corresponding electrical signals including an image converter is described. The image converter includes a substrate of semiconductor material, an insulating layer on the front surface of the substrate, and an electrical contact on the back surface of the substrate. A first series of parallel transparent conductive stripes is on the insulating layer with a processing circuit connected to each of the conductive stripes for detecting the modulated voltages generated thereon. In a first embodiment of the invention, a modulated light stripe perpendicular to the conductive stripes scans the image converter. In a second embodiment a second insulating layer is deposited over the conductive stripes and a second series of parallel transparent conductive stripes perpendicular to the first series is on the second insulating layer. A different frequency current signal is applied to each of the second series of conductive stripes and a modulated image is applied to the image converter.

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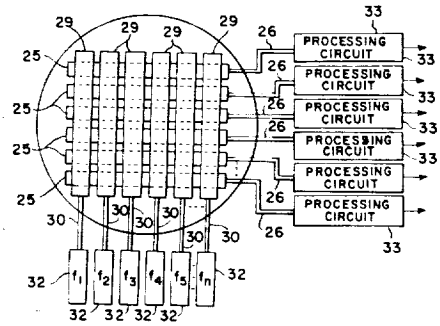


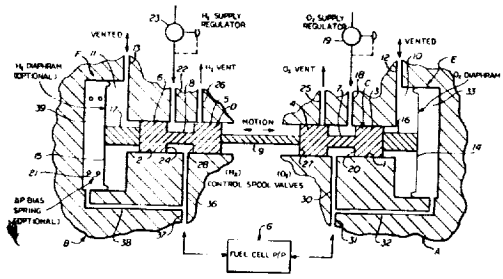
N82-32843*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

REACTANT PRESSURE DIFFERENTIAL CONTROL FOR FUEL CELL GASES Patent Application

Arthur P. Grasso, inventor (to NASA) (Hamilton Standard, Windsor Locks, Conn.) Filed 1 Jul. 1982 8 p Sponsored by NASA
(NASA-Case-MSC-20127-1; US-Patent-Appl-SN-394344) Avail: NTIS HC A02/MF A01 CSCL 10A

A pair of values connected in tandem are balanced between pressure of reactant gases supplied to a fuel cell power plant to control the pressure differences between the gases so as to maintain those pressure substantially in the proportions necessary for operation of the fuel cell.

NASA



46 GEOPHYSICS

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

For space radiation see *93 Space Radiation*.

N82-26890*# National Aeronautics and Space Administration. Pasadena Office, Calif.

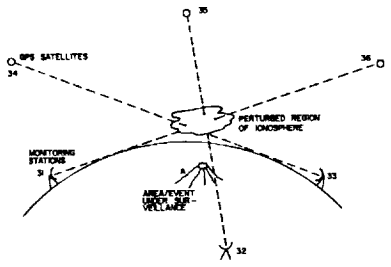
METHOD AND APPARATUS FOR CALIBRATING THE IONOSPHERE AND APPLICATION TO SURVEILLANCE OF GEOPHYSICAL EVENTS Patent Application

Peter F. MacDoran, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 17 Nov. 1981 18 p

(Contract NAS7-100)

(NASA-Case-NPO-15430-1; NASA-Case-NPO-15437-1; US-Patent-Appl-SN-322317) Avail: NTIS HC A02/MF A01 CSCL 04A

The columnar electron content of the ionosphere between a spacecraft and a receiver is measured in realtime by cross correlating two coherently modulated signals transmitted at different frequencies from the spacecraft to the receiver using a cross correlator. The time difference of arrival of the modulated signals is proportional to electron content of the ionosphere. A variable delay is adjusted relative to a fixed delay in the respective channels to produce a maximum at the cross correlator output. The difference in delay required to produce this maximum is a measure of the columnar electron content of the ionosphere. A plurality of monitoring stations and GPS satellites are employed to locate any terrestrial event that produces an ionospheric disturbance. NASA



47 METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

N82-24779* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

LIGHTNING DISCHARGE IDENTIFICATION SYSTEM Patent

Carl L. Lennon, inventor (to NASA) Issued 9 Jun. 1981 4 p Filed 30 May 1979 Supersedes N79-25313 (17 - 16, p 2121)

(NASA-Case-KSC-11099-1; US-Patent-4,272,720; US-Patent-Appl-SN-043945; US-Patent-Class-324-72; US-Patent-Class-324-77R) Avail: US Patent and Trademark Office CSCL 04B

A system for differentiating between cloud to cloud and cloud to ground lightning discharges is described which includes an electric field antenna that senses the rate of charge of an electric field produced by a lightning discharge. When the signal produced by the electric field exceeds a predetermined threshold, it is fed to a coincidence detector. A VHF antenna is also provided and generates a video signal responsive to a cloud to cloud lightning discharge, and this signal is fed through a level sensor, an inverter, to the coincidence detector simultaneously with the signal from the field detector. When signals from the electric field antenna and the VHF antenna appear at the coincidence detector simultaneously, such indicates that there is a cloud to cloud lightning discharge; whereas, when there is not a signal prouced on the VHF antenna simultaneously with a signal produced by the field sensor, then a strike indicator connected to the coincidence detector indicates a cloud to ground lightning discharge.

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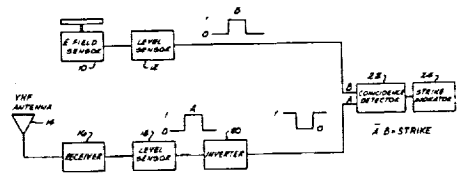

52 AEROSPACE MEDICINE

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

N82-22875* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

CERVIX-TO-RECTUM MEASURING DEVICE IN A RADIATION APPLICATOR FOR USE IN THE TREATMENT OF CERVICAL CANCER Patent

David R. Fischell (Howard Univ.) and Jeffrey C. Mazique, inventors (to NASA) (Howard Univ.) Issued 13 Oct. 1981 5 p Filed 12 May 1977 Supersedes N77-26796 (15 - 17, p 2306) Continuation of abandoned US Patent Appl. SN-672209, filed 31 Mar. 1976 Sponsored by NASA

(NASA-Case-GSC-12081-2; US-Patent-4,294,264; US-Patent-Appl-SN-796258; US-Patent-Appl-SN-672209; US-Patent-Class-128-778; US-Patent-Class-128-1.2; US-Patent-Class-33-143C) Avail: US Patent and Trademark Office CSCL 06B

A cervix-to-rectum measuring device to be used in the treatment of cervical cancer is described. It includes a handle and a probe pivotably connected to the handle for insertion in the rectum. The measuring device further includes means for coupling the handle to an intrauterine radiation applicator when the latter is positioned in the uterine cervix and the probe is inserted in the rectum to pivot the handle about the probe. A gear is provided which is adapted to pivot with the probe. A pinion pivotably connected to the handle meshes with the gear. A pointer fixed to the pinion is displaced in response to the pivoting of the handle about the probe, and this displacement can be read from a scale on the handle, providing an indication of the cervix-to-rectum distance.

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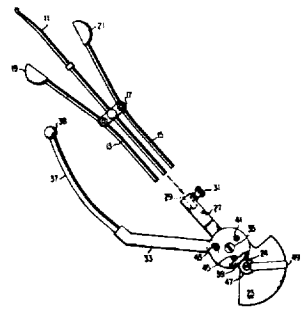


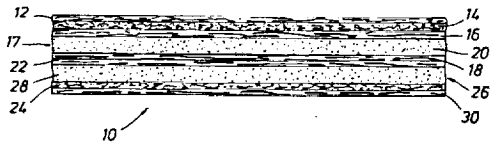
N82-26960*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

ABSORBENT PRODUCT AND ARTICLES MADE THEREFROM Patent Application

James V. Correals and Frederic S. Dawn, inventors (to NASA)

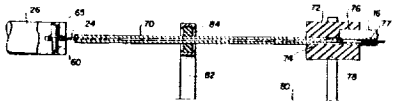
Filed 14 Apr. 1982 14 p
(NASA-Case-MSC-18223-2; US-Patent-Appl-SN-368187) Avail: NTIS HC A02/MF A01 CSCL 06B

An invention comprising a multi-layered absorbent article suitable for collecting body waste products is described. Author



N82-26961*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
APPARATUS FOR DISINTEGRATING KIDNEY STONES Patent Application
Donald S. Friedman, inventor (to NASA) Filed 13 May 1982 13 p
(NASA-Case-GSC-12652-1; US-Patent-Appl-SN-377891) Avail: NTIS HC A02/MF A01 CSCL 06B

A mechanical system for disintegrating urinary calculi, particularly an ultrasonic apparatus for fragmenting urinary calculi in situ is described. The useful life of the wire probe in an ultrasonic kidney stone disintegration instrument is enhanced and prolonged by attaching the wire of the wire probe to the tip of an ultrasonic transducer by means of a clamping arrangement. Additionally, damping material is applied to the wire probe in the form of a damper tube through which the wire probe passes in the region adjacent the transducer tip. Novelty is believed to reside in the combination of a grooved adjustable anvil in the transducer tip at the clamping point of the wire probe to lessen concentrated stresses in the wire and a vibrational damper system which minimizes lateral wire motion at the transducer tip while nevertheless transmitting linear motion which acts to prolong the useful life of the wire probe. NASA



N82-29862* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ACOUSTIC TOOTH CLEANER Patent
Joseph S. Heyman, inventor (to NASA) Issued 25 May 1982 5 p Filed 14 Aug. 1980 Supersedes N81-12734 (19 - 03, p 0392)
(NASA-Case-LAR-12471-1; US-Patent-4,331,422; US-Patent-Appl-SN-178193; US-Patent-Class-433-125; US-Patent-Class-433-118; US-Patent-Class-433-86; US-Patent-Class-128-62A) Avail: US Patent and Trademark Office CSCL 06B

An acoustic oral hygiene unit is described that uses acoustic energy to oscillate mild abrasive particles in a water suspension which is then directed in a low pressure stream onto the teeth. The oscillating abrasives scrub the teeth clean removing food particles, plaque, calculous, and other foreign material from tooth surfaces, interproximal areas, and tooth-gingiva interface more effectively than any previous technique. The relatively low power output and the basic design makes the invention safe and convenient for everyday use in the home without special training. This invention replaces all former means of home dental prophylaxis, and requires no augmentation to fulfill all requirements for daily oral hygienic care.

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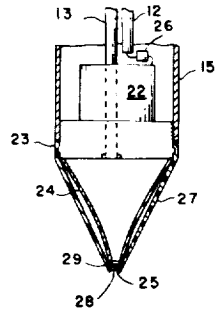
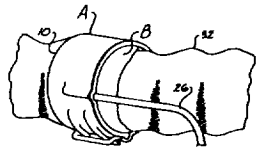


N82-26962*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PROSTHETIC OCCLUSIVE DEVICE FOR AN INTERNAL PASSAGEWAY Patent Application
John B. Tenney, Jr., inventor (to NASA) (Rochester General Hospital, N.Y.) Filed 23 Apr. 1982 15 p Sponsored by NASA
(NASA-Case-MFS-25640-1; US-Patent-Appl-SN-371352) Avail: NTIS HC A02/MF A01 CSCL 06B

A prosthetic device for occluding an internal passageway of the human body, for example, for closing the urinary canal, is described. The device includes a cuff having a backing collar and two isolated cuff chambers. The fluid pressure of one chamber is regulated by a pump/value reservoir unit. The other chamber is unregulated in pressure but its fluid volume is adjusted by removing or adding fluid to a septum/reservoir by means of a hypodermic needle. Pressure changes are transmitted between the two cuff chambers via faying surfaces which are sufficiently large in contact area and thin as to transmit pressure generally without attenuation. By adjusting the fluid volume of the septum, the operating pressure of the device may be adjusted to accommodate tubular organs of different diameter sizes as well as to compensate for changes in the organ following implant without re-operation. NASA

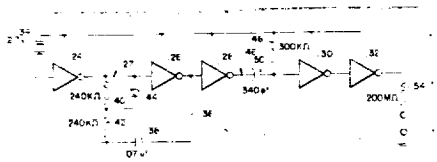


N82-29863* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
IMPLANTABLE ELECTRICAL DEVICE Patent
Murzban D. Jhabvala, inventor (to NASA) Issued 5 Jan. 1982 5 p Filed 27 May 1980 Supersedes N80-27073 (18 - 17, p 2329)
(NASA-Case-GSC-12560-1; US-Patent-4,308,868; US-Patent-Appl-SN-153246; US-Patent-Class-128-421) Avail: US Patent and Trademark Office CSCL 06B

A fully implantable and self contained device is disclosed composed of a flexible electrode array for surrounding damaged nerves and a signal generator for driving the electrode array

with periodic electrical impulses of nanoampere magnitude to induce regeneration of the damaged nerves.

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

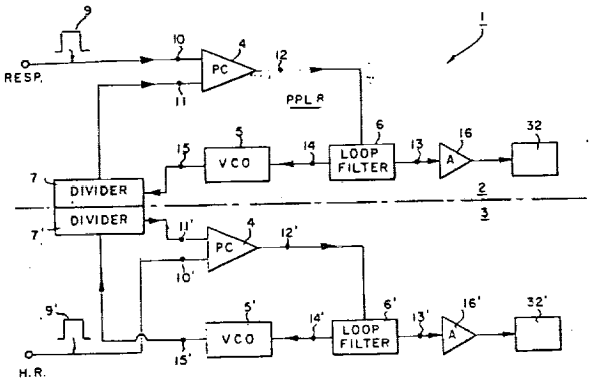


N82-32971*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

DUAL PHYSIOLOGICAL RATE MEASUREMENT INSTRUMENT Patent Application

Tommy Cooper, inventor (to NASA) (Narco Scientific, Houston, Tex.) Filed 1 Jul. 1982 12 p Sponsored by NASA (NASA-Case-MSC-20078-1; US-Patent-Appl-SN-394343) Avail: NTIS HC A02/MF A01 CSCL 06B

An instrument for converting a physiological pulse rate into a corresponding linear output voltage is described. The instrument, which accurately measures the rate of an unknown rectangular pulse wave over an extended range of values, comprises a phase-licked loop including a phone comparator, a filtering network, and a voltage-controlled oscillator, arranged in cascade. The phase comparator has a first input responsive to the pulse wave and a second input responsive to the output signal of the voltage-controlled oscillator. The comparator provides a signal dependent on the difference in phase and frequency between the signals appearing on the first and second imputs. A high-input impedance amplifier accepts an output from the filtering network and provides an amplified output DC signal to a utilization device for providing measurement of the rate of the pulse wave. NASA



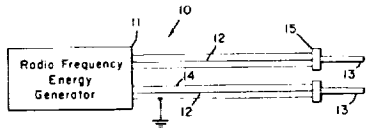
N82-33996* National Aeronautics and Space Administration. Pasadena Office, Calif.

HYPERTHERMIA HEATING APPARATUS Patent

Paul M. Gammell, inventor (to NASA) Issued 31 Aug. 1982 8 p Filed 13 May 1980 (NASA-Case-NPO-14549-2; US-Patent-4,346,715; US-Patent-Appl-SN-149526; US-Patent-Appl-SN-918705; US-Patent-Class-128-422; US-Patent-Class-128-784; US-Patent-Class-128-804) Avail: US Patent and Trademark Office CSCL 06B

Electromagnetic energy is delivered to a localized area of a patient's body in a hyperthermic treatment so that it provides a uniform distribution of electromagnetic flux lines within the localized area of the patient's body and produces a uniform and localized heating gradient. An electrode array includes a number of electrodes which are arranged in pair, with the electrodes in each pair being spaced a particular distance apart. The array is driven by a balanced line system which is electromagnetically coupled to each pair of electrodes and which is shielded by a ground coaxial shield which itself is ground to the body of the patient. Each electrode is embedded in a Teflon stand-off in order to move the region of strong field, from the body, produced by rapidly changing potentials. The two pairs of electrodes forming a cross-like geometry are used with the balanced line systems. The electrical power is either multiplexed among the electrodes or the second pair is driven by a potential which is sinusoidal and which is 90% out of phase with the first balanced line system which is also sinusoidal.

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



54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

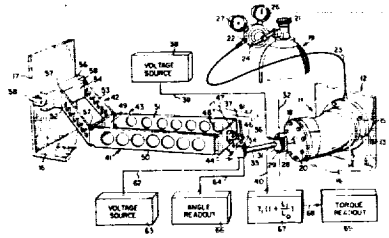
Includes human engineering; biotechnology; and space suits and protective clothing.

N82-26987* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PRESSURE SUIT JOINT ANALYZER Patent

Hubert C. Vykukal and Bruce W. Webbon, inventors (to NASA) Issued 19 Jan. 1982 7 p Filed 17 Jul. 1980 Supersedes N80-30042 (18 - 20, 2756) (NASA-Case-ARC-11314-1; US-Patent-4,311,055; US-Patent-Appl-SN-168943; US-Patent-Class-73-862.08) Avail: US Patent and Trademark Office CSCL 06K

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

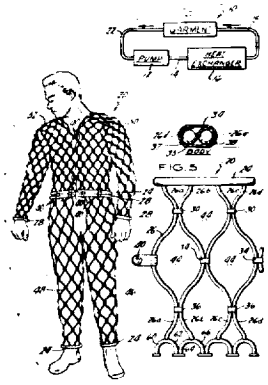


N82-29002* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

THERMAL GARMENT Patent

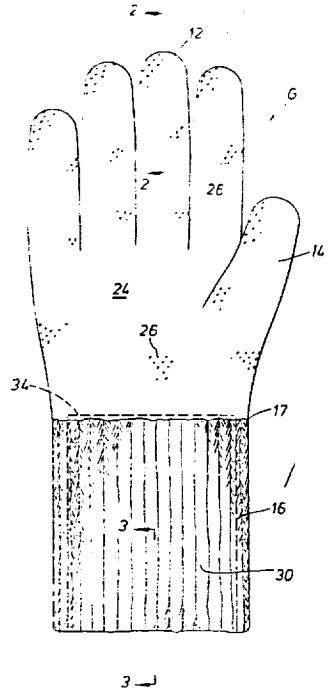
James H. Hopper, inventor (to NASA) (United Aircraft Corp., East Hartford, Conn.) Issued 3 Jan. 1967 6 p Filed 3 Sep. 1964 Sponsored by NASA (NASA-Case-XMS-03694-1; US-Patent-3,295,594; US-Patent-Appl-SN-394280; US-Patent-Class-165-46) Avail: US Patent and Trademark Office CSCL 06K

An anthropomorphic thermal garment made entirely of fluid-carrying tubing, joined in such a way that the tubes form a network or mesh fabric, is described. N.W.



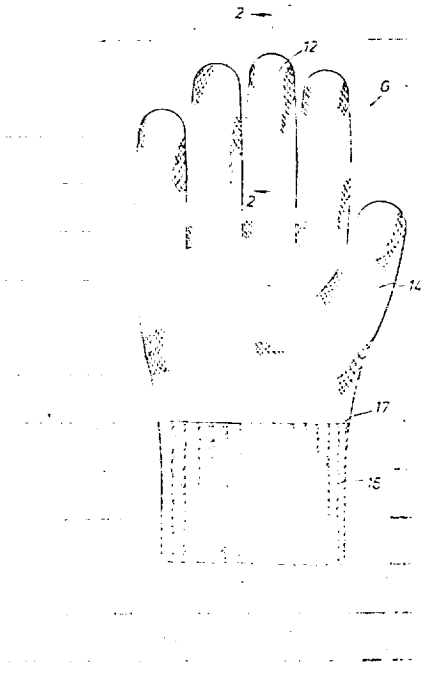
N82-32985*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
HEAT RESISTANT PROTECTIVE HAND COVERING Patent Application
Richard P. Tschirsh (Little (Arthur D.), Inc., Cambridge, Mass.), Kenneth R. Sidman (Little (Arthur D.), Inc., Cambridge, Mass.), and Irving J. Arms, inventors (to NASA) (Little (Arthur D.), Inc., Cambridge, Mass.) Filed 30 Jun. 1982 16 p Sponsored by NASA
(NASA-Case-MSC-20261-1; US-Patent-Appl-SN-393586) Avail: NTIS HC A02/MF A01 CSCL 06Q

A heat-resistant, protective glove having a shell made of a fabric of a temperature-resistant aromatic polyamide fiber is described. The outer surface of the shell is coated with a five-resistant elastomers and a liner, generally conforming and secured to the shell and disposed inwardly of the shell, the lines being made of a felt fabric of temperature-resistant aromatic polymide fiber. NASA



N82-32986*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
HEAT RESISTANT PROTECTIVE HAND COVERING Patent Application
Richard P. Tschirsh (Little (Arthur D.), Inc., Cambridge, Mass.), Kenneth R. Sidman (Little (Arthur D.), Inc., Cambridge, Mass.), and Irving J. Arms, inventors (to NASA) (Little (Arthur D.), Inc., Cambridge, Mass.) Filed 30 Jun. 1982 17 p Sponsored by NASA
(NASA-Case-MSC-20261-2; US-Patent-Appl-SN-393581) Avail: NTIS HC A02/MF A01 CSCL 06Q

A heat-resistant protective glove having first and second shells which generally define the palm and back sides of the glove is described. The shell sections are made of a temperature-resistant aromatic polyamide fiber; the first, a twill weave and the second, a knitted fabric. The first liner has a flame-resistant, elastomeric coating on a surface contiguons to the inner surface of the first shell section. A second liner is located inwardly of the second shell section. The liner sections are comprised of a temperature-resistant aromatic polyamide fiber felt fabric. NASA



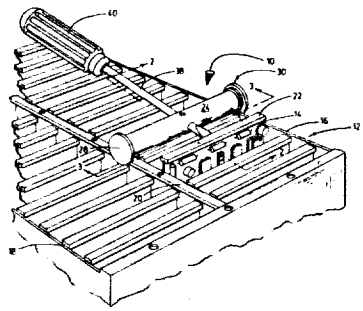
60 COMPUTER OPERATIONS AND HARDWARE

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

N82-24839* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
COMPUTER CIRCUIT CARD PULLER Patent
Ralph V. Sawyer and Bill Szuwalski, inventors (to NASA) Issued 29 Dec. 1981 5 p Filed 12 Mar. 1980 Supersedes N80-20589 (19 - 11, p 1424)
(NASA-Case-FRC-11042-1; US-Patent-4,307,510; US-Patent-Appl-SN-129778; US-Patent-Class-29-764; US-Patent-Class-29-267; US-Patent-Class-254-131) Avail: US Patent and Trademark Office CSCL 09B

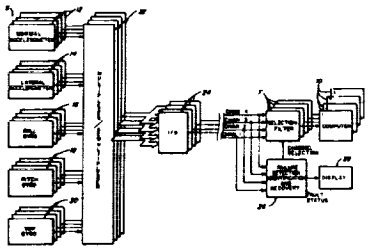
The invention generally relates to hand tools, and more particularly to an improved device for facilitating removal of printed circuit cards from a card rack characterized by longitudinal side

rails arranged in a mutually spaced parallelism and a plurality of printed circuit cards extended between the rails of the rack.
Official Gazette of the U.S. Patent and Trademark Office



N82-29013* National Aeronautics and Space Administration Lyndon B. Johnson Space Center, Houston, Tex.
RECONFIGURING REDUNDANCY MANAGEMENT Patent
Hendrik J. C. Gelderloos, inventor (to NASA) (Honeywell, Inc., St. Petersburg, Fla.) Issued 27 Apr. 1982 10 p Filed 30 Jul. 1980 Supersedes N80-30050 (18 - 20, p 2758)
(NASA-Case-MSC-18498-1; US-Patent-4,327,437; US-Patent-Appl-SN-173518; US-Patent-Class-371-68; US-Patent-Class-244-194, US-Patent-Class-318-564) Avail: US Patent and Trademark Office CSCL 09B

A redundancy management system is described wherein input signals from a sensor are provided redundantly in parallel so that a primary control signal may be selected. Median value signals for groups of three sensors are detected in median value selectors of selection filter. The detected median value signals are then also compared in a subtractor/comparator to determine whether any of them exceed the others by an amount greater than the signal level for a failed sensor. If so, the exceeding detected medium value signal is sent to a control computer as the primary control signal. If not, the lowest level detected medium value signal is sent as the primary control signal.
Official Gazette of the U.S. Patent and Trademark Office



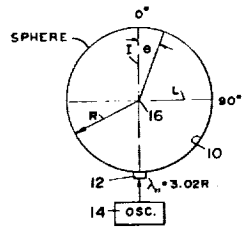
71 ACOUSTICS

Includes sound generation, transmission and attenuation.

For noise pollution see *45 Environment Pollution*.

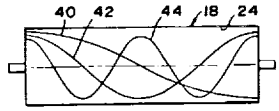
N82-27086*# National Aeronautics and Space Administration. Pasadena Office, Calif.
ACOUSTIC LEVITATION METHODS AND APPARATUS Patent Application
Martin B. Barmatz (JPL, California Inst. of Technology, Pasadena) and Nathan Jacobi, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 31 Mar. 1982 21 p
(Contract NAS7-100)
(NASA-Case-NPO-15562-1; US-Patent-Appl-SN-364097) Avail: NTIS HC A02/MF A01 CSCL 20A

Methods are described for acoustically levitating objects within chambers of spherical and cylindrical shape. The wavelengths for chambers of particular dimensions are given, for generating standing wave patterns of any of a variety of modes within the chambers. For a spherical chamber the lowest resonant mode is excited by applying a wavelength of 3.02R, where R is the chamber radius. The two lowest pure radial modes for that chamber, are excited by applying wavelengths of 1.40R and 0.814R. For a cylindrical chamber of radius R, the lowest mode is at a wavelength of 3.41R, and the lowest pure radial modes are at wavelengths of 1.64R and 0.896R.
NASA



N82-27087*# National Aeronautics and Space Administration. Pasadena Office, Calif.
ACOUSTIC AGGLOMERATION METHODS AND APPARATUS Patent Application
Martin B. Barmatz, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 24 Mar. 1982 16 p
(Contract NAS7-100)
(NASA-Case-NPO-15466-1; US-Patent-Appl-SN-361217) Avail: NTIS HC A02/MF A01 CSCL 20A

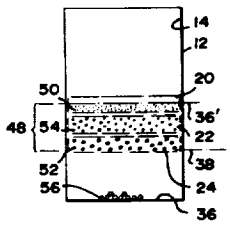
Methods are described for using acoustic energy to agglomerate fine particles on the order of one micron diameter that are suspended in gas, to provide agglomerates large enough for efficient removal by other techniques. The gas with suspended particles, is passed through the length of a chamber while acoustic energy at a resonant chamber mode is applied to set up one or more acoustic standing wave patterns that vibrate the suspended particles to bring them together so they agglomerate. Several widely different frequencies can be applied to efficiently vibrate particles of widely differing sizes. The standing wave pattern can be applied along directions transversed to the flow of the gas. The particles can be made to move in circles by applying acoustic energy in perpendicular directions with the energy in both directions being of the same wavelength but 90 deg out of phase.
NASA



N82-29112*# National Aeronautics and Space Administration. Pasadena Office, Calif.
ACOUSTIC PARTICLE SEPARATION Patent Application
Martin B. Barmatz (JPL), James D. Stoneburner (JPL), Nathan Jacobi (JPL), and Taylor Wang, inventors (to NASA) (JPL) Filed 19 May 1982 17 p
(Contract NAS7-100)
(NASA-Case-NPO-15559-1; US-Patent-Appl-SN-379601) Avail: NTIS HC A02/MF A01 CSCL 20A

A method for separating particles according to a particular property such as size, density, shape, or magnetic or electrostatic properties is described. The particles are passed through a chamber while resonant acoustic energy is applied along a chamber dimension such as its height H. The acoustic standing wave pattern urges particles toward the center of an acoustic well of the pattern, such as the center of the chamber height at 36. At the same time a nonacoustic force such as gravity urges the

particles away from the center of the well. Particles are distributed within a levitation region according to a particle property. For example, with particles of the same material but different size, large particles lie in an area near the bottom of the levitation region, while the smallest particles lie in an area near the top of the levitation region. NASA



72 ATOMIC AND MOLECULAR PHYSICS

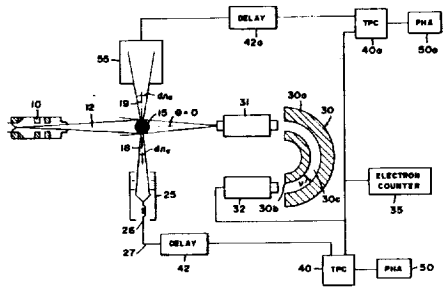
Includes atomic structure and molecular spectra.

N82-24953*# National Aeronautics and Space Administration. Pasadena Office, Calif.

MEANS AND METHOD FOR CALIBRATING A PHOTON DETECTOR UTILIZING ELECTRON-PHOTON COINCIDENCE Patent Application

Santosh K. Srivastava, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 15 Mar. 1982 17 p
(Contract NAS7-100)
(NASA-Case-NPO-15644-1; US-Patent-Appl-SN-358088) Avail: NTIS HC A02/MF A01 CSCL 20H

An arrangement for calibrating a photon detector particularly applicable for the ultraviolet (UV) and vacuum ultraviolet (VUV) regions is based on electron photon coincidence utilizing crossed electron beam-atom beam collisions. Atoms are excited by electrons which lose a known amount of energy and scatter with a known remaining energy, while the excited atoms emit photons of known radiation. Electrons of the known remaining energy scattered in a particular direction are separated from other electrons and are sensed and counted. Photons emitted in a direction related to the particular direction of scattered electrons are detected by a detector to serve as a standard. Each of the electrons is used to initiate the measurement of a time interval which terminate with the arrival of a photon exciting the photon detector. NASA



74 OPTICS

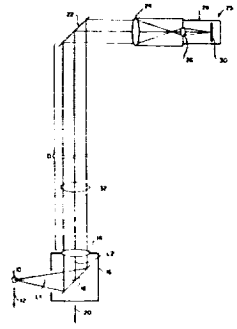
Includes light phenomena.

N82-24072* National Aeronautics and Space Administration. Pasadena Office, Calif.

CONSTANT MAGNIFICATION OPTICAL TRACKING SYSTEM Patent

Robert E. Frazer, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 16 Mar. 1982 7 p Filed 30 Apr. 1980 Supersedes N80-24152 (18 - 14, p 1915) Sponsored by NASA
(NASA-Case-NPO-14813-1; US-Patent-4,320,290; US-Patent-Appl-SN-145282; US-Patent-Class-250-216; US-Patent-Class-250-235) Avail: US Patent and Trademark Office CSCL 20F

A constant magnification optical tracking system for continuously tracking of a moving object is described. In the tracking system, a traveling objective lens maintains a fixed relationship with an object to be optically tracked. The objective lens was chosen to provide a collimated light beam oriented in the direction of travel of the moving object. A reflective surface is attached to the traveling objective lens for reflecting an image of the moving object. The object to be tracked is a free-falling object which is located at the focal point of the objective lens for at least a portion of its free-fall path. A motor and control means is provided for mantaining the traveling objective lens in a fixed relationship relative to the free-falling object, thereby keeping the free-falling object at the focal point and centered on the axis of the traveling objective lens throughout its entire free-fall path. M.D.K.

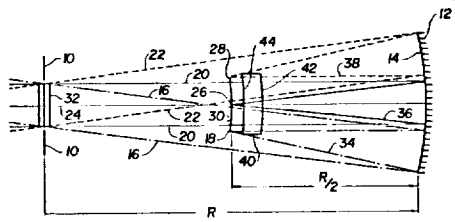


N82-24973*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

HIGH SPEED MULTI FOCAL PLANE OPTICAL SYSTEM Patent Application

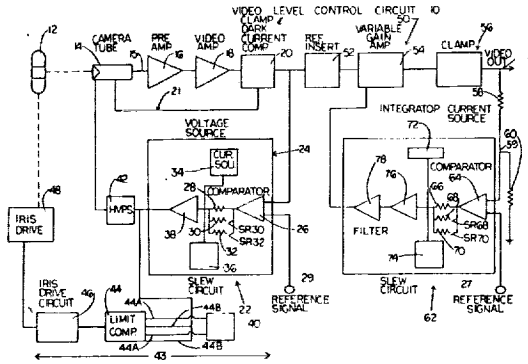
Peter O. Minott, inventor (to NASA) Filed 22 Dec. 1981 13 p
(NASA-Case-GSC-12683-1; US-Patent-Appl-SN-333535) Avail: NTIS HC A02/MF A01 CSCL 20F

An apparatus is disclosed for eliminating beam splitter generated optical aberrations in a pupil concentric optical system providing a number of spatially separated images on differential focal planes or surfaces. The system employs a buried surface beam splitter with spherically curved entrance and exit faces which are concentric to a system aperture stop. The entrance face is located in the path of a converging light beam directed to it from an image forming objective element which is also concentric to the aperture stop. NASA



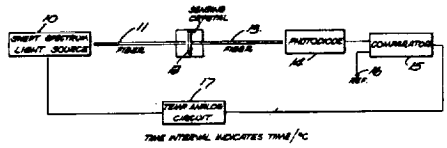
N82-27121*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
TELEVISION CAMERA VIDEO LEVEL CONTROL SYSTEM Patent Application
Marvin Kravitz (RCA Corp., Princeton, N.J.), Larry A. Freedman (RCA Corp., Princeton, N.J.), Elmer H. Fredd (RCA Corp., Princeton, N.J.), and Dan E. Deneff, inventors (to NASA) (RCA Corp., Princeton, N.J.) Filed 9 Apr. 1982 16 p Sponsored by NASA
(NASA-Case-MSC-18578-1; US-Patent-Appl-SN-367132) Avail: NTIS HC A02/MF A01 CSCL 20F

A video level control system is provided which generates a normalized video signal for a camera processing circuit. The video level control system includes a lens iris which provides a controlled light signal to a camera tube. The camera tube converts the light signal provided by the lens iris into electrical signals. A feedback circuit in response to the electrical signals generated by the camera tube, provides feedback signals to the lens iris and the camera tube. This assures that a normalized video signal is provided in a first illumination range. An automatic gain control loop, which is also responsive to the electrical signals generated by the camera tube, operates in tandem with the feedback circuit. This assures that the normalized video signal is maintained in a second illumination range. NASA



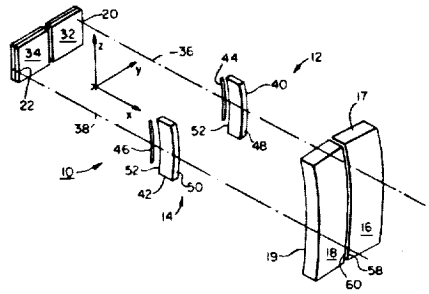
N82-30071* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
OPTICAL CRYSTAL TEMPERATURE GAUGE WITH FIBER OPTIC CONNECTIONS Patent
Madan M. Sharma, inventor (to NASA) (TRW Defense and Space Systems Group, Redondo Beach, Calif.) Issued 6 Jul. 1982 9 p Filed 12 Sep 1980 Supersedes N81-15818 (19 - 06, p 0825) Sponsored by NASA
(NASA-Case-MSC-18627-1; US-Patent-4,338,516; US-Patent-Appl-SN-186881; US-Patent-Class-250-226; US-Patent-Class-250-231R; US-Patent-Class-374-162R) Avail: US Patent and Trademark Office CSCL 20F

An optical temperature gauge uses a semiconductor crystal with a band-edge shift property which is temperature dependent. An external narrow band light source provides optical excitation through a optical fiber and light energy thus passed through the crystal is conveyed by a second optical fiber to a light-to-electric transducers at an external location. The crystal can be located in cryogenic or other systems, to provide remote read-out. The light wavelength is varied (scanned) in a repetitive pattern in source with the instantaneous wavelength passing over the band-edge wavelength during each cycle of the scan. The timing of the crossover is related to the temperature of the crystal by electronic means. Several alternative elements of instrumentation are disclosed. A variation in the basic measurement apparatus is also disclosed, in which the band gap voltage of a light source such as a laser diode is evaluated at the time of band-edge crossover in the crystal and converted to a temperature value.
Official Gazette of the U.S. Patent and Trademark Office



N82-30073*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DUAL APERTURE MULTISPECTRAL SCHMIDT OBJECTIVE Patent Application
Peter O. Minott, inventor (to NASA) Filed 13 May 1982 15 p
(NASA-Case-GSC-12756-1; US-Patent-Appl-SN-378535) Avail: NTIS HC A02/MF A01 CSCL 20F

A dual aperture, off-axis catadioptic Schmidt objective is formed by symmetrically aligning two pairs of Schmidt objectives on opposite sides of a common plane. Each objective has a spherical primary mirror with a spherical focal plane and center of curvature aligned along an optic axis laterally spaced apart from the common plane. A multiprison beamsplitter with burned dichoic layers and a convex entrance and concave exit surface optically concentric to the center of curvature may be positioned at the focal plane. The primary mirrors of each objective may be connected rigidly together and may have equal or unequal focal lengths. NASA

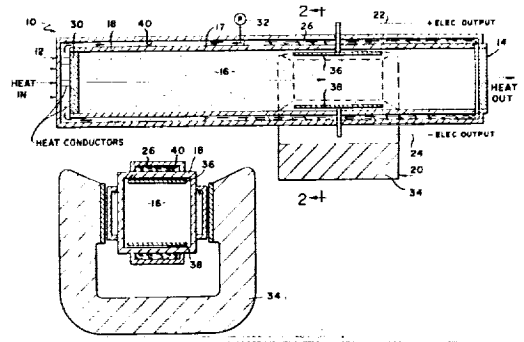


75 PLASMA PHYSICS

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

N82-24079*# National Aeronautics and Space Administration. Pasadena Office, Calif.
MHD ELECTRICAL GENERATOR Patent Application
Dennis J. Fitzgerald, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 14 Feb. 1982 13 p
(Contract NAS7-100)
(NASA-Case-NPO-15399-1; US-Patent-Appl-SN-330612) Avail: NTIS HC A02/MF A01 CSCL 20I

An MHD (magnetohydrodynamic electric generator is provided which is of high efficiency and which can operate in a closed cycle with minimal moving parts for unattended applications. The generator includes a porous tungsten element heated by a heat source and a system for passing primarily pure cesium vapor into the porous element, to produce contact ionization of the cesium with a higher percentage of ions than can be sustained. The highly ionized cesium vapor, and corresponding numbers of electrons from the tungsten element, recombine to produce a much higher temperature as the cesium flows through a tube past an MHD converter that generates electricity, and into a cool end of the tube where the cesium is cooled to a liquid temperature. The liquid can be recirculated by passing it through capillary passages extending towards the location where cesium vapor enters the porous tungsten element. NASA



76 SOLID-STATE PHYSICS

Includes superconductivity.

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

N82-23031*# National Aeronautics and Space Administration. Pasadena Office, Calif.

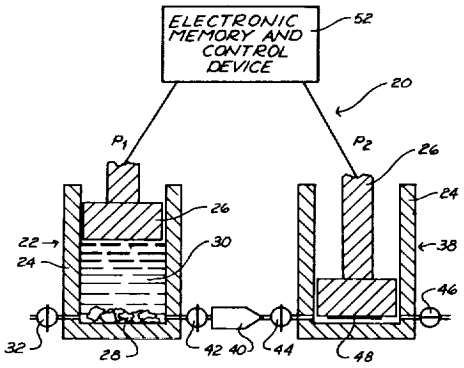
METHOD AND APPARATUS FOR GROWTH OF CRYSTALS BY PRESSURE REDUCTION OF SUPERCRITICAL OR SUBCRITICAL SOLUTION Patent Application

Paul J. Shlichta, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 26 Jan. 1982 28 p

(Contract NAS7-100)

(NASA-Case-NPO-15772-1; US-Patent-Appl-SN-342944) Avail: NTIS HC A03/MF A01 CSCL 20L

Crystals of high morphological quality are grown by dissolution of a substance to be grown into the crystal in a suitable solvent under high pressure, and by subsequent slow, time controlled reduction of the pressure of the resulting solution. During the reduction of the pressure interchange of heat between the solution and the environment is minimized by performing the pressure reduction under isothermal or adiabatic conditions. NASA



N82-24993*# National Aeronautics and Space Administration. Pasadena Office, Calif.

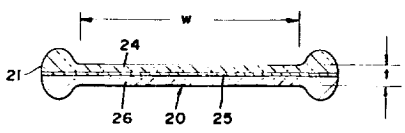
A METHOD OF INCREASING MINORITY CARRIER LIFETIME IN SILICON WEB OR THE LIKE Patent Application

James K. Liu (JPL, California Inst. of Technology, Pasadena), Guenter H. Schwuttke (JPL, California Inst. of Technology, Pasadena), and Krishna M. Koliwad, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 31 Mar. 1982 10 p

(Contract NAS7-100)

(NASA-Case-NPO-15530-1; US-Patent-Appl-SN-364092) Avail: NTIS HC A02/MF A01 CSCL 20B

A silicon dendrite is grown as a ribbon forming two silicon layers which are separated by an interface layer which contains a certain large number of defects. Significant increase of minority carrier lifetime with homogeneous distribution at the outer surfaces of the two silicon crystal layers are achieved by processing the web in an atmosphere of a selected gas, e.g., oxygen, nitrogen, or an inert gas, for about 30 minutes to several hours, at a temperature preferably on the order of 900 to 1200 C. NASA



N82-25995*# National Aeronautics and Space Administration. Pasadena Office, Calif.

CONTROLLED IN-SITU ETCHBACK Patent Application

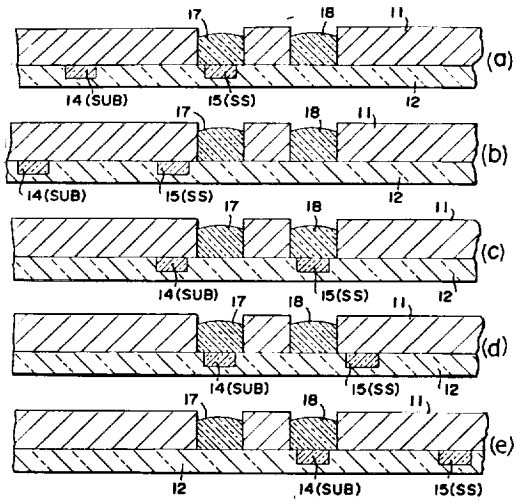
Alan C. Seabaugh (JPL, California Inst. of Technology, Pasadena) and Robert J. Mattauch, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 30 Nov. 1981 16 p

(Contract NAS7-100)

(NASA-Case-NPO-15625-1; US-Patent-Appl-SN-325933) Avail: NTIS HC A02/MF A01 CSCL 20L

A controlled in situ etch-back technique is in which an etch melt and a growth melt are first saturated by a source-seed crystal is described. Etchback of a substrate then takes plce by the slightly undersaturated etch melt. This is followed by liquid phase epitaxial growth melt, which is slightly supersaturated.

J.D.



N82-30105* National Aeronautics and Space Administration. Pasadena Office, Calif.

ELECTROMIGRATION PROCESS FOR THE PURIFICATION OF MOLTEN SILICON DURING CRYSTAL GROWTH Patent

Paul J. Shlichta, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 18 May 1982 7 p Filed 10 Feb. 1981 Sponsored by NASA

(NASA-Case-NPO-14831-1; US-Patent-4,330,359; US-Patent-Appl-SN-233269; US-Patent-Class-156-608; US-Patent-Class-156-602; US-Patent-Class-422-246) Avail: US Patent and Trademark Office CSCL 20B

A process for the purification of molten materials during crystal growth by electromigration of impurities to localized dirty zones. In the Czochralski crystal growing process, the impurities are electromigrated away from the crystallization interface by applying a direct electrical current to the molten silicon for electromigrating the charged impurities away from the crystal growth interface. The edge-defined film-fed crystal growth process, a direct electrical current is applied between the two faces which are used in forming the molten silicon into a ribbon. The impurities, migrated to one side only of the crystal ribbon, may be removed or left in place. If left in place, they will not adversely affect the ribbon when used in solar collectors. The migration of the impurity to one side only of the silicon ribbon is especially suitable

for use with asymmetric dies which preferentially crystallize uncharged impurities along one side or face of the ribbon.

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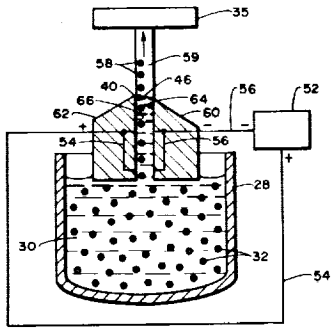


85 URBAN TECHNOLOGY AND TRANSPORTATION

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

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

N82-33288* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

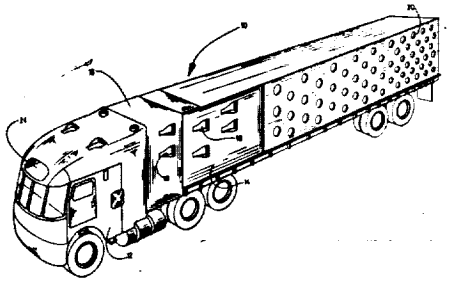
LOW-DRAG GROUND VEHICLE PARTICULARLY SUITED FOR USE IN SAFELY TRANSPORTING LIVESTOCK Patent

Edwin J. Saltzman, inventor (to NASA) Issued 10 Aug. 1982 7 p Filed 5 Aug. 1980 Supersedes N80-33312 (18 - 23, p 3220)

(NASA-Case-FRC-11058-1; US-Patent-4,343,506; US-Patent-Appl-SN-175453; US-Patent-Class-296-1S; US-Patent-Class-105-2R; US-Patent-Class-244-53B; US-Patent-Class-296-24C; US-Patent-Class-296-91) Avail: US Patent and Trademark Office CSCL 13F

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

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



91 LUNAR AND PLANETARY EXPLORATION

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.*

N82-25042*# National Aeronautics and Space Administration. Pasadena Office, Calif.

ION MASS SPECTROMETER Patent Application

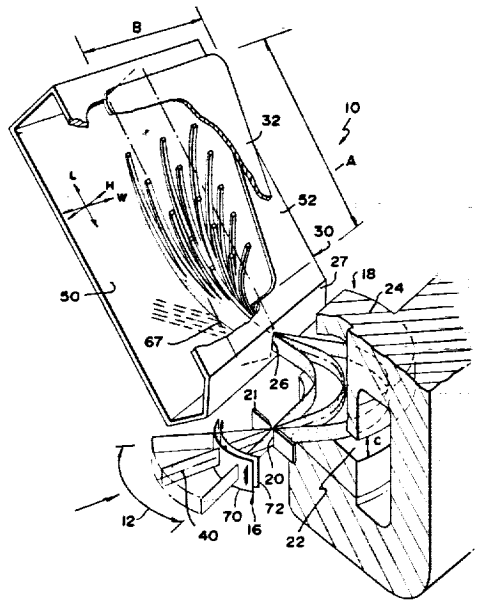
Marcia M. Neugebauer (JPL, California Inst. of Tech., Pasadena), Douglas R. Clay (JPL, California Inst. of Tech., Pasadena), Bruce E. Golstein (JPL, California Inst. of Tech., Pasadena), and Raymond Goldstein, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 24 Mar. 1982 16 p

(Contract NAS7-100)

(NASA-Case-NPO-15423-1; NASA-Case-NPO-15622-1; US-Patent-Appl-SN-361216) Avail: NTIS HC A02/MF A01 CSCL 03B

An ion mass spectrometer is described which detects and indicates the characteristics of ions received over a wide angle, and which indicates the mass to charge ratio, the energy, and the direction of each detected ion. The spectrometer includes a magnetic analyzer having a sector magnet that passes ions received over a wide angle, and an electrostatic analyzer positioned to receive ions passing through the magnetic analyzer. The electrostatic analyzer includes a two dimensional ion sensor at one wall of the analyzer chamber, that senses not only the lengthwise position of the detected ion to indicate its mass to charge ratio, but also detects the ion position along the width of the chamber to indicate the direction in which the ion was travelling.

NASA



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15. Supplementary Notes

Section 1: Abstracts

16. Abstract

This bibliography is issued in two sections: Section 1 - Abstracts, and Section 2 - Indexes. This issue of the Abstract Section cites 234 patents and applications for patent introduced into the NASA scientific and technical information system during the period of July 1982 through December 1982. Each entry of the Abstract Section consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or application for patent.

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