



NASA SP-7039(21)
Section 1
Abstracts

NASA PATENT ABSTRACTS BIBLIOGRAPHY



A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

JULY 1982

(NASA-SP-7039 (21)-Sect-1)	NASA PATENT	N83-10978
ABSTRACTS BIBLIOGRAPHY, A CONTINUING		
BIBLIOGRAPHY. / SUPPLEMENT 21. / SECTION 1:		
ABSTRACTS (National Aeronautics and Space		Unclas
Administration) 45 p HC \$8.50	CSCS 05B 00/82	35696

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ACCESSION NUMBER RANGES

<i>Bibliography Number</i>	<i>STAR Accession Numbers</i>
NASA SP-7039(04)	N69-20701 – N73-33931
NASA SP-7039(12)	N74-10001 – N77-34042
NASA SP-7039(13)	N78-10001 – N78-22018
NASA SP-7039(14)	N78-22019 – N78-34034
NASA SP-7039(15)	N79-10001 – N79-21993
NASA SP-7039(16)	N79-21994 – N79-34158
NASA SP-7039(17)	N80-10001 – N80-22254
NASA SP-7039(18)	N80-22255 – N80-34339
NASA SP-7039(19)	N81-10001 – N81-21997
NASA SP-7039(20)	N81-21998 – N81-34139
NASA SP-7039(21)	N82-10001 – N82-22140

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**NASA SP-7039(21)
Section 1
Abstracts**

NASA

**PATENT
ABSTRACTS
BIBLIOGRAPHY**

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

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



Scientific and Technical Information Branch 1982
National Aeronautics and Space Administration
Washington, DC

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INTRODUCTION

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

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

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

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

The 87 citations published in this issue of the Abstract Section cover the period January 1982 through June 1982. The Index Section references over 4000 citations covering the period May 1969 through June 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 → **N82-18203*** National Aeronautics and Space Administration, Langley Research Center, Hampton, Va. → **SOURCE**

TITLE → **SLOTTED VARIABLE CAMBER FLAP Patent Application**

INVENTOR → Dana G. Andrews, inventor (to NASA) (Boeing Commercial Airplane Co., Seattle) Filed 30 Oct. 1981 13 p Sponsored by NASA → **US PATENT APPLICATIONS SERIAL NUMBER**

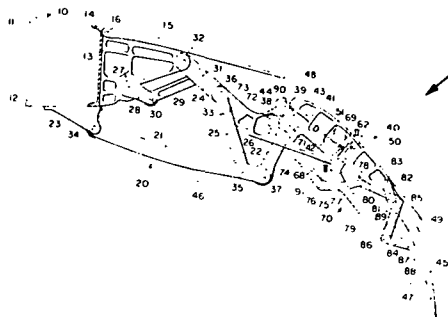
NASA CASE NUMBER → (NASA-Case-LAR-12541-1; US-Patent-Appl-SN-315588) Avail: NTIS HC A02/MF A01 CSCL 01C → **AVAILABILITY**

ABSTRACT →

COSATI CODE →

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 (\$6.00 domestic; \$12.00 foreign). Microfiche are sold at price code A01 (\$4.00 domestic; \$8.00 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.

- 1245.200 Scope of subpart.
- 1245.201 Policy and objective.
- 1245.202 Definitions.
- 1245.203 Authority to grant licenses.

Restrictions and Conditions

- 1245.204 All licenses granted under this subpart.

Types of Licenses

- 1245.205 Nonexclusive licenses.
- 1245.206 Exclusive and partially exclusive licenses.

Procedures

- 1245.207 Application for a license.
- 1245.208 Processing applications.
- 1245.209 Notice to Attorney General.
- 1245.210 Modification and termination of licenses.
- 1245.211 Appeals.
- 1245.212 Protection and administration of inventions.

- 1245.213 Transfer of custody.
 - 1245.214 Confidentiality of information.
- 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

PATENT LICENSING REGULATIONS

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 (e)(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 any 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 practical 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

PATENT LICENSING REGULATIONS

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;

(d) 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 §§ 1245.208(a)(1)(iii)(A) or

PATENT LICENSING REGULATIONS

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. 81-31809 Filed 10-30-81; 8:45 am]

BILLING CODE 7510-01-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*.

01 AERONAUTICS (GENERAL) N.A.

02 AERODYNAMICS N.A.

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

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

03 AIR TRANSPORTATION AND SAFETY N.A.

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

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

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION 1

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

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

05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE 1

Includes aircraft simulation technology.

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

06 AIRCRAFT INSTRUMENTATION 2

Includes cockpit and cabin display devices; and flight instruments.

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

07 AIRCRAFT PROPULSION AND POWER N.A.

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

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

08 AIRCRAFT STABILITY AND CONTROL N.A.

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

09 RESEARCH AND SUPPORT FACILITIES (AIR) 2

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

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

ASTRONAUTICS

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

For related information see also *Aeronautics*

12 ASTRONAUTICS (GENERAL) N.A.

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

13 ASTRODYNAMICS N.A.

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

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

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

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

15 LAUNCH VEHICLES AND SPACE VEHICLES N.A.

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

16 SPACE TRANSPORTATION N.A.

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

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

17 SPACECRAFT COMMUNICATION, COMMAND AND TRACKING N.A.

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

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

18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE 2

Includes spacecraft thermal and environmental control; and attitude control.

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

19 SPACECRAFT INSTRUMENTATION N.A.

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

20 SPACECRAFT PROPULSION AND POWER 3

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

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

CHEMISTRY AND MATERIALS

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

23 CHEMISTRY AND MATERIALS (GENERAL) 3

Includes biochemistry and organic chemistry.

24 COMPOSITE MATERIALS 3

Includes laminates.

25 INORGANIC AND PHYSICAL CHEMISTRY 3

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

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

26 METALLIC MATERIALS N.A.

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

27 NONMETALLIC MATERIALS 5

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

28 PROPELLANTS AND FUELS 6

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

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

ENGINEERING

Includes engineering (general); communications; electronics and electrical engineering; fluid mechanics and heat transfer; instrumentation and photography; lasers and masers; mechanical engineering; quality assurance and reliability; and structural mechanics.

For related information see also *Physics*.

31 ENGINEERING (GENERAL) 7

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

32 COMMUNICATIONS 8

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

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

33 ELECTRONICS AND ELECTRICAL ENGINEERING 10

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

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

34 FLUID MECHANICS AND HEAT TRANSFER 13

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

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

35 INSTRUMENTATION AND PHOTOGRAPHY 15

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

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

36 LASERS AND MASERS 16

Includes parametric amplifiers.

37 MECHANICAL ENGINEERING 17

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

38 QUALITY ASSURANCE AND RELIABILITY N.A.

Includes product sampling procedures and techniques; and quality control.

39 STRUCTURAL MECHANICS N.A.

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

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

GEOSCIENCES

Includes geosciences (general); earth resources; energy production and conversion; environment pollution; geophysics; meteorology and climatology; and oceanography.

For related information see also *Space Sciences*.

42 GEOSCIENCES (GENERAL) N.A.

43 EARTH RESOURCES 20

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

For instrumentation see 35 *Instrumentation and Photography*.

44 ENERGY PRODUCTION AND CONVERSION 21

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

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

45 ENVIRONMENT POLLUTION 22

Includes air, noise, thermal and water pollution; environment monitoring; and contamination control.

46 GEOPHYSICS 22

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

For space radiation see 93 *Space Radiation*.

47 METEOROLOGY AND CLIMATOLOGY N.A.

Includes weather forecasting and modification.

48 OCEANOGRAPHY N.A.

Includes biological, dynamic and physical oceanography; and marine resources.

LIFE SCIENCES

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

51 LIFE SCIENCES (GENERAL) 22
Includes genetics.

52 AEROSPACE MEDICINE 23
Includes physiological factors; biological effects of radiation; and weightlessness.

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

54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT N.A.
Includes human engineering; biotechnology; and space suits and protective clothing.

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

MATHEMATICAL AND COMPUTER SCIENCES

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

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

60 COMPUTER OPERATIONS AND HARDWARE 23
Includes computer graphics and data processing.
For components see *33 Electronics and Electrical Engineering*.

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

62 COMPUTER SYSTEMS N.A.
Includes computer networks.

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

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

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

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

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

PHYSICS

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

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

71 ACOUSTICS 24
Includes sound generation, transmission, and attenuation.
For noise pollution see *45 Environment Pollution*.

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

73 NUCLEAR AND HIGH-ENERGY PHYSICS 25
Includes elementary and nuclear particles; and reactor theory.
For space radiation see *93 Space Radiation*.

74 OPTICS 25
Includes light phenomena.

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

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

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

SOCIAL SCIENCES

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

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

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

82 DOCUMENTATION AND INFORMATION SCIENCE N.A.

Includes information storage and retrieval technology; micrography; and library science.

For computer documentation see *61 Computer Programming and Software*.

83 ECONOMICS AND COST ANALYSIS N.A.

Includes cost effectiveness studies.

84 LAW AND POLITICAL SCIENCE N.A.

Includes space law; international law; international cooperation; and patent policy.

85 URBAN TECHNOLOGY AND TRANSPORTATION N.A.

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

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

SPACE SCIENCES

Includes space sciences (general); astronomy; astrophysics; lunar and planetary exploration; solar physics; and space radiation.

For related information see also *Geosciences*.

88 SPACE SCIENCES (GENERAL) N.A.

89 ASTRONOMY N.A.

Includes radio and gamma-ray astronomy; celestial mechanics; and astrometry.

90 ASTROPHYSICS N.A.

Includes cosmology; and interstellar and interplanetary gases and dust.

91 LUNAR AND PLANETARY EXPLORATION N.A.

Includes planetology; and manned and unmanned flights.

For spacecraft design see *18 Spacecraft Design, Testing and Performance*. For space stations see *15 Launch Vehicles and Space Vehicles*.

92 SOLAR PHYSICS N.A.

Includes solar activity, solar flares, solar radiation and sunspots.

93 SPACE RADIATION N.A.

Includes cosmic radiation; and inner and outer earth's radiation belts.

For biological effects of radiation see *52 Aerospace Medicine*. For theory see *73 Nuclear and High-Energy Physics*.

GENERAL

99 GENERAL N.A.

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

Section 2 • Indexes

SUBJECT INDEX
INVENTOR INDEX
SOURCE INDEX
NUMBER INDEX
ACCESSION NUMBER INDEX



JULY 1982 (Supplement 21)

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.

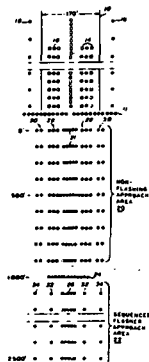
N82-16059* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SPECTRALLY BALANCED CHROMATIC LANDING APPROACH LIGHTING SYSTEM Patent

Wendell D. Chase, inventor (to NASA) Issued 22 Sep. 1981 10 p Filed 10 Dec. 1976 Supersedes N77-12031 (15 - 03, p 0286)

(NASA-Case-ARC-10990-1; US-Patent-4,291,294; US-Patent-Appl-SN-749420; US-Patent-Class-340-26; US-Patent-Class-244-114R) Avail: US Patent and Trademark Office CSCL 17G

Red warning lights delineate the runway approach with additional blue lights juxtaposed with the red lights such that the red lights are chromatically balanced. The red/blue point light sources result in the phenomenon that the red lights appear in front of the blue lights with about one and one-half times the diameter of the blue. To a pilot observing these lights along a glide path, those red lights directly below appear to be nearer than the blue lights. For those lights farther away seen in perspective at oblique angles, the red lights appear to be in a position closer to the pilot and hence appear to be above the corresponding blue lights. This produces a very pronounced three dimensional effect referred to as chromostereopsis which provides valuable visual cues to enable the pilot to perceive his actual position above the ground and the actual distance to the runway. Official Gazette of the U.S. Patent and Trademark Office



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.

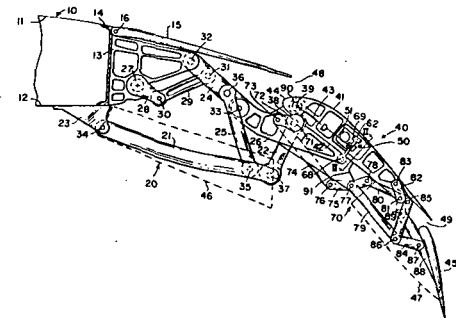
N82-18203*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

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



06 AIRCRAFT INSTRUMENTATION

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*.

N82-16075* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
SYSTEM FOR PROVIDING AN INTEGRATED DISPLAY OF INSTANTANEOUS INFORMATION RELATIVE TO AIRCRAFT ATTITUDE, HEADING, ALTITUDE, AND HORIZONTAL SITUATION Patent

Robert James, inventor (to NASA) (James and Associates, Lancaster, Calif.) Issued 11 Aug. 1981 19 p Filed 30 May 1979 Supersedes N79-24988 (17 - 16, p 2074) Sponsored by NASA

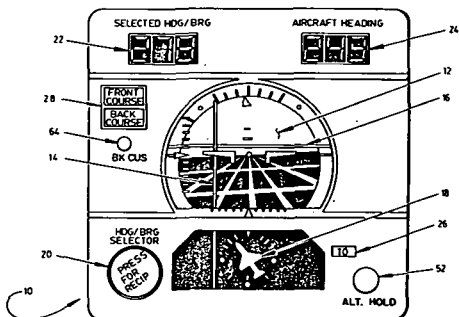
(NASA-Case-FRC-11005-1; US-Patent-4,283,705;

US-Patent-Appl-SN-043942; US-Patent-Class-340-27NA;

US-Patent-Class-73-178R) Avail: US Patent and Trademark Office CSCL 01D

A display device is disclosed which is particularly suited for providing the pilot of an aircraft with combined inflight altitude, heading, attitude, and horizontal situation information previously available only by using two or three devices providing separate displays. The preferred embodiment combines a commonly used and commercially available flight director-type device for providing a display in combination with a miniature aircraft supported for angular displacement from a vertical orientation to indicate heading error, or heading offset, and an extended course deviation indicator bar which projects into juxtaposition with the miniature aircraft for providing a true picture of the aircraft's horizontal situation relative to a selective VOR, ILS, or MLS course.

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



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)*.

N82-11088* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
WIND TUNNEL SUPPLEMENTARY MACH NUMBER MINIMUM SECTION INSERT Patent

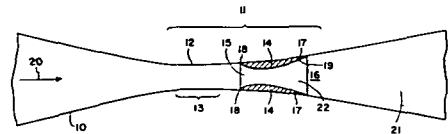
Lana M. Couch, inventor (to NASA) Issued 1 Sep. 1981 6 p Filed 28 Mar. 1980 Supersedes N80-22369 (18 - 13, p 1674

(NASA-Case-LAR-12532-1; US-Patent-4,286,460;

US-Patent-Appl-SN-135040; US-Patent-Class-73-147) Avail: US Patent and Trademark Office CSCL 14B

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

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



18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes spacecraft thermal and environmental control; and attitude control.

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

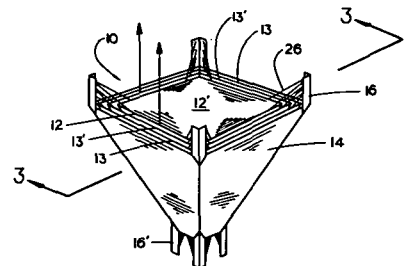
N82-10106*# National Aeronautics and Space Administration. Pasadena Office, Calif.

RADIATIVE COOLER Patent Application

Stanley W. Petrick (JPL, California Inst. of Tech., Pasadena) and Ramon D. Garcia, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 17 Jul. 1981 13 p (Contract NAS7-100)

(NASA-Case-NPO-15465-1; US-Patent-Appl-SN-284289) Avail: NTIS HC A02/MF A01 CSCL 22B

A device for use in passively cooling spaces, applicable to any level of thermal radiation in vacuum and to high-intensity thermal radiation in non-vacuum environments, is described. The device includes an enclosure nested in a multiplicity of thin, low-emittance, highly-reflective shields suspended in a casing in mutual angular relation and having V-shaped spaces for redirecting thermal radiation entering the sides of the shields. Successively reduced quantities of thermal radiation are reflected by the surfaces along substantially parallel paths extended through the V-shaped spaces to a common heat sink such as the cold thermal background of space. T.M.



20 SPACECRAFT PROPULSION AND POWER

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

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

N82-18314* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

LOW THRUST MONOPROPELLANT ENGINE Patent

John D. Kuenzly, inventor (to NASA) (TRW, Inc., Redondo Beach, Calif.) Issued 15 Sep. 1981 5 p Filed 20 Dec. 1978 Supersedes N79-15151 (17 - 06, p 0707) Continuation of abandoned US Patent Appl. SN-819029, filed 25 Jul. 1977 Sponsored by NASA

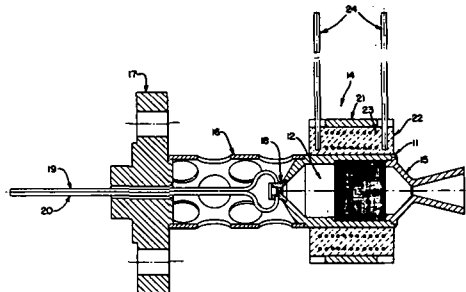
(NASA-Case-GSC-12194-2; US-Patent-4,288,982;

US-Patent-Appl-SN-971474; US-Patent-Appl-SN-819029;

US-Patent-Class-60-200R; US-Patent-Class-60-39,46M) Avail:

NTIS Avail: US Patent and Trademark Office CSCL 21H

The engine has a conventional body and nozzle configuration. The monopropellant fuel is fed into the thruster with dual injection tubes via an injector shell with dual spray jets. The spray jets are positioned generally opposed to each other. A heater screen pack combination thermally decomposes the fuel after injection into the combustion chamber of the thruster. NASA



23 CHEMISTRY AND MATERIALS (GENERAL)

Includes biochemistry and organic chemistry.

N82-16174* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SYNTHESIS OF POLYFORMALS Patent

Algirdas C. Poshkus, inventor (to NASA) (NAS-NRC, Washington, D.C.) Issued 7 Jul. 1981 3 p Filed 3 Jul. 1979 Supersedes N79-30376 (17 - 21, p 2793) Sponsored by NASA

(NASA-Case-ARC-11244-1; US-Patent-4,277,402;

US-Patent-Appl-SN-054501; US-Patent-Class-260-340.9R;

US-Patent-Class-568-445; US-Patent-Class-568-497) Avail: US

Patent and Trademark Office CSCL 07C

Formals of $\text{CH}_2\text{OH}(\text{CHOH})$ sub n CH_2OH polyols ($n = 2$ to 4) are prepared in less than 15 minutes by heating to about 125 C, a mixture of e.g. sorbitol and paraformaldehyde in slight excess (5 to 10%), in the presence of e.g. sulfuric acid in catalytic quantities. Elution with methanol and filtration yield the pure solid cyclic triformal. The process can be carried in stages, using almost stoichiometric quantities of paraformaldehyde, but without any change in overall heating time.

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

24 COMPOSITE MATERIALS

Includes laminates.

N82-11118*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

THERMAL CONTROL COATINGS BASED ON TRIALKOXY-SILANE HYDROLYSATE BINDERS Patent Application

William J. Patterson and James E. Curry, inventors (to NASA) Filed 28 Aug. 1981 12 p

(NASA-Case-MFS-25620-1; US-Patent-Appl-SN-297487) Avail: NTIS HC A02/MF A01 CSCL 11D

Certain trialkoxysilanes react with water to produce trifunctional monomers, which in turn undergo condensation polymerization to produce a 'laddered' silicon resin. The resin is then combined with a selected pigment to provide a mixture suitable for application as a coating. Such coatings have a low absorptance and a high emittance, along with resistance to degradation of reflective and mechanical properties upon prolonged exposure to ultraviolet radiation in vacuum. NASA

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.

N82-11144* National Aeronautics and Space Administration. Pasadena Office, Calif.

FLUIDIZED BED COAL COMBUSTION REACTOR Patent

Philip I. Moynihan (JPL, California Inst. of Technology, Pasadena) and Donald L. Young, inventors (to NASA) (JPL, California Inst. of Technology Pasadena) Issued 8 Sep. 1981 7 p Filed 15 Dec. 1978 Supersedes N79-14388 (17 - 05, 0601) Sponsored by NASA

(NASA-Case-NPO-14273-1; US-Patent-4,287,838;

US-Patent-Appl-SN-969759; US-Patent-Class-110-234;

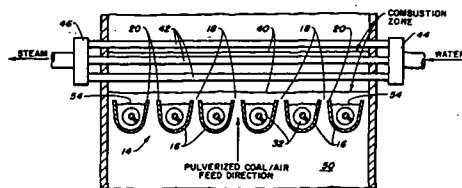
US-Patent-Class-110-255; US-Patent-Class-110-266;

US-Patent-Class-110-245; US-Patent-Class-122-4D) Avail: US

Patent and Trademark Office CSCL 21B

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

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



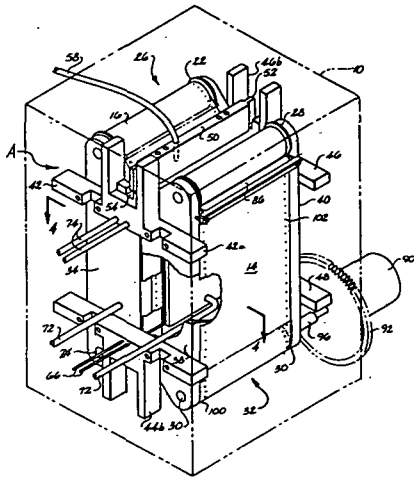
25 INORGANIC AND PHYSICAL CHEMISTRY

N82-11147*# National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.

STATIC CONTINUOUS ELECTROPHORESIS DEVICE Patent Application

Percy H. Rhodes, inventor (to NASA) Filed 6 Oct. 1981 19 p (NASA-Case-MFS-25306-1; US-Patent-Appl-SN-309293) Avail: NTIS HC A02/MF A01 CSCL 07D

A separation chamber which includes a pair of spaced opposed moving walls which entrain the fluid to flow as a rigid body with minimized distortion and spaced opposed side walls is carried within a water-tight enclosure housing which contains the electrolytic buffer solution. A pair of substrate assemblies include opposed front substrate walls facing the separation chamber. Endless traveling belts are carried by the substrate assemblies defining the moving wall structure. By means of a vacuum which communicates with the front substrate walls through vacuum ports, the traveling belts are held positively sealed against the substrate walls so as to avoid and prevent leakage behind the belts. The walls are prevented from bowing. The moving belts are covered with a thin layer of low zeta-potential covering coating material such as methylcellulose with is advantageous in reducing the electroosmosis effect. NASA



N82-12166* National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Tex.

ELECTROPHOTOLYSIS OXIDATION SYSTEM FOR MEASUREMENT OF ORGANIC CONCENTRATION IN WATER Patent

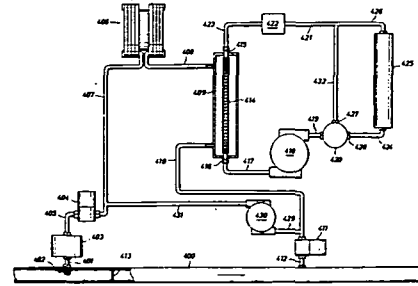
H. Eugene Winkler, inventor (to NASA) Issued 6 Oct. 1981 9 p Filed 21 May 1979 Supersedes N79-23167 (17 - 14, p 1818)

(NASA-Case-MS-16497-1; US-Patent-4,293,522; US-Patent-Appl-SN-041145; US-Patent-Class-422-80; US-Patent-Class-23-230PC; US-Patent-Class-23-232E; US-Patent-Class-204-1T; US-Patent-Class-204-195S; US-Patent-Class-204-263; US-Patent-Class-204,264; US-Patent-Class-204-266; US-Patent-Class-204-275; US-Patent-Class-204-276; US-Patent-Class-204-278) Avail: US Patent and Trademark Office CSCL 07D

Methods and apparatus for determining organic carbon in aqueous solution are described. The method comprises subjecting the aqueous solution to electrolysis, for generating oxygen from water, and simultaneously to ultraviolet radiation, for oxidation of substantially all organic carbon to carbon dioxide. The carbon

dioxide is measured and the value is related to the concentration of organic carbon in the aqueous solution.

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



N82-12168*# National Aeronautics and Space Administration, Ames Research Center, Moffett Field, Calif.

FIRE EXTINGUISHANT MATERIALS Patent Application

Robert L. Altman, Ludwig A. Mayer (San Jose State Univ.), and Alan C. Ling, inventors (to NASA) (San Jose State Univ.) Filed 3 Nov. 1981 11 p

(NASA-Case-ARC-11252-1; US-Patent-Appl-SN-317977) Avail: NTIS HC A02/MF A01 CSCL 21B

Fire extinguishant materials were developed for extinguishing fires on hot metal surfaces caused by liquid fuels such as jet engine fuels. The composition of the materials is a mixture of a finely divided aluminum compound and alkali metal, stannous or plumbous halide. The aluminum compound may be aluminum hydroxide, alumina or boehmite, but preferably it is an alkali metal dawsonite. The metal halide may be an alkali metal, e.g. potassium iodide, bromide, or chloride, or stannous or plumbous iodide, bormide, or chloride. Potassium iodide is preferred. The presence of the halide improves the performance of the aluminum compound in extinguishing fires on hot metal surfaces. NASA

N82-21268* National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.

METHOD OF MAKING FORMULATED PLASTIC SEPARATORS FOR SOLUBLE ELECTRODE CELLS Patent

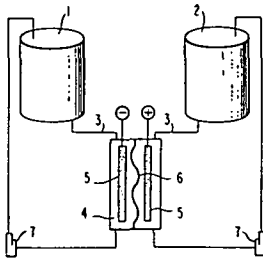
Dean W. Sheibley, inventor (to NASA) Issued 5 Jan. 1982 7 p Filed 3 Nov. 1977 Supersedes N78-25149 (18 - 18, p 2085) Continuation of US Patent Appl. SN-776146, US Patent-4,133,941, filed 10 Mar. 1977

(NASA-Case-LEW-12358-2; US-Patent-4,309,372; US-Patent-Appl-SN-848428; US-Patent-4,133,941; US-Patent-Appl-SN-776146; US-Patent-Class-264-453; US-Patent-Class-264-53; US-Patent-Class-264-216; US-Patent-Class-427-115; US-Patent-Class-427-244; US-Patent-Class-427-246) Avail: US Patent and Trademark Office CSCL 07D

A method making a membrane comprised of a hydrochloric acid-insoluble sheet of a mixture of a rubber and a powdered ion transport material is disclosed. The sheet can be present as a coating upon a flexible and porous substrate. These membranes can be used in oxidation-reduction electrical accumulator cells wherein the reduction of one member of a couple is accompanied by the oxidation of the other member of the couple on the other side of the cell and this must be accompanied by a change in chloride ion concentration in both sides. The method comprises preparing a mixture of fine rubber particles, a solvent for the rubber and a powdered ion transport material. The mixture is

formed into a sheet and dried to produce a microporous sheet. The ion transport material includes particles ranging from about 0.01 to 10 microns in size and comprises from 20 to 50 volume percent of the microporous sheet.

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



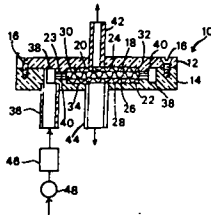
N82-21269* National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.

AIR REMOVAL DEVICE Patent

Franklin W. Booth and Robert A. Bruce Issued 24 Nov. 1981 4 p Filed 27 Feb. 1976 Supersedes N76-23522 (14 - 14, p 1795) Continuation of abandoned US Patent Appl. SN-810576, filed 26 Mar. 1969

(NASA-Case-XLA-8914-2; US-Patent-4,302,223; US-Patent-Appl-SN-662181; US-Patent-Appl-SN-810576; US-Patent-Class-55-158; US-Patent-Class-210-321.1) Avail: US Patent and Trademark Office CSCL 07D

The disclosure concerns a device suitable for removing air from water under both zero and one 'g' gravity conditions. The device is comprised of a pair of spaced membranes on being hydrophobic and the other being hydrophilic. The air-water mixture is introduced into the space therebetween, and the selective action of the membranes yields removal of the air from the water. Official Gazette of the U.S. Patent and Trademark Office



27 NONMETALLIC MATERIALS

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

N82-10227* National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

METHOD OF NEUTRALIZING THE CORROSIVE SURFACE OF AMINE-CURED EPOXY RESINS Patent Application

Sheng Yen Lee, inventor (to NASA) Filed 14 Aug. 1981 9 p (NASA-Case-GSC-12686-1; US-Patent-Appl-SN-293412) Avail: NTIS HC A02/MF A01 CSCL 111

The corrosive alkaline surface layer of an epoxy resin product formed by the curing of the epoxy with an aliphatic amine is

eliminated by first applying a non-solvent to remove most or all of the free unreacted amine and then applying a layer of a chemical reagent to neutralize the unused amine or amine functional groups by forming a substituted urea. The surface then may be rinsed with acetone and then with alcohol. The non-solvent may be an alcohol. The neutralizing chemical reagent is a monoisocyanate or a mono-isothiocyanate. Preferred is an aromatic mono-isocyanate such as phenyl isocyanate, nitrophenyl isocyanate or naphthyl isocyanate. NASA

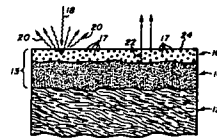
N82-10228* National Aeronautics and Space Administration, Ames Research Center, Moffett Field, Calif.

HIGH TEMPERATURE GLASS THERMAL CONTROL STRUCTURE AND COATING Patent Application

David A. Stewart, Howard E. Goldstein, and Daniel B. Leiser, inventors (to NASA) (Stanford Univ., Calif.) Filed 2 Oct. 1981 18 p

(NASA-Case-ARC-11164-1; US-Patent-Appl-SN-308007) Avail: NTIS HC A02/MF A01 CSCL 11C

A high temperature stable and solar radiation stable thermal control coating either useful as such, applied directly to a member to be protected, or applied as a coating on a reusable surface insulation is discussed. The coating has a base coat layer and an overlay glass layer. The base coat layer has a high emittance, and the overlay layer is formed from discrete, but sintered glass particles to give the overlay a high scattering coefficient. The resulting two-layer space and thermal control coating has an absorptivity-to-emissivity ratio of less than or equal to 0.4 at room temperature, with an emittance of 0.8 at 1200 F. It is capable of exposure to either solar radiation or temperatures as high as 2000 F without significant degradation. A reusable surface insulation structure in incorporating the coating and having primary application as a space shuttle heat shield is also discussed. NASA



N82-11206* National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.

ALUMINUM ION-CONTAINING POLYIMIDE ADHESIVES Patent

Anne K. St.Clair, Larry T. Taylor (Old Dominion Univ.), and Terry L. St.Clair, inventors (to NASA) Issued 18 Aug. 1981 5 p Filed 7 Nov. 1979 Supersedes N80-16164 (18 - 07, p 0837)

(NASA-Case-LAR-12640-1; US-Patent-4,284,461; US-Patent-Appl-SN-092142; US-Patent-Class-156-331.5; US-Patent-Class-156-307.3; US-Patent-Class-156-307.5; US-Patent-Class-156-307.7; US-Patent-Class-528-172; US-Patent-Class-528-173; US-Patent-Class-528-180; US-Patent-Class-528-207; US-Patent-Class-528-208; US-Patent-Class-528-210; US-Patent-Class-528-211; US-Patent-Class-528-225; US-Patent-Class-528-228; US-Patent-Class-528-351; US-Patent-Class-528-353; US-Patent-Class-528-126) Avail: US Patent and Trademark Office, CSCL 11A

A meta-oriented aromatic diamine is reacted with an aromatic dianhydride and an aluminum compound in the presence of a water or lower alkanol miscible ether solvent to produce an

27 NONMETALLIC MATERIALS

intermediate polyamic acid. The polyamic acid is then converted to the thermally stable, metal ion-filled polyimide by heating in the temperature range of 300 C to produce a flexible, high temperature adhesive.

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

N82-11210* National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.

CASTABLE HIGH TEMPERATURE REFRACTORY MATERIALS Patent Application

Isidor Zaplatynsky, inventor (to NASA) Filed 13 Oct. 1981 5 p

(NASA-Case-LEW-13080-2; US-Patent-Appl-SN-310713) Avail: NTIS HC A02/MF A01 CSCL 11B

The fabrication of chemically inert ceramic bodies that are both high refractory and porous is disclosed. A paste is formed by mixing alumina grain having a uniform particle size with colloidal silica that is stabilized with ammonia. This paste is then cast without forming a compact and dried without pressing. After drying, the cast body was sufficient green strength to be handled, and it is transferred to a furnace for curing. A green body prepared in accordance with the invention does not undergo shrinkage during either curing or prolonged subsequent heating.

NASA

N82-16238* National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Tex.

HEAT SEALABLE, FLAME AND ABRASION RESISTANT COATED FABRIC Patent

Richard P. Tschirch (Little (Arthur D.), Inc., Cambridge, Mass.) and Kenneth R. Sidman, inventors (to NASA) (Little (Arthur D.), Inc., Cambridge, Mass.) Issued 18 Aug. 1981 5 p Filed 30 Apr. 1980 Supersedes N80-24440 (18 - 15, p 1959) Sponsored by NASA

(NASA-Case-MS-C-18382-1; US-Patent-4,284,682; US-Patent-Appl-SN-145107; US-Patent-Class-428-263; US-Patent-Class-106-18.16; US-Patent-Class-106-18.24; US-Patent-Class-260-45.7R; US-Patent-Class-427-393.3; US-Patent-Class-428-264; US-Patent-Class-428-265; US-Patent-Class-428-267; US-Patent-Class-428-272) Avail: US Patent and Trademark Office CSCL 07C

Flame retardant, abrasion resistant elastomeric compositions are comprised of thermoplastic polyurethane polymer and flame retarding amounts of a filler selected from decabromodiphenyl oxide and antimony oxide in a 3:1 weight ratio, and decabromodiphenyl oxide, antimony oxide, and ammonium polyphosphate in a 3:1:3 weight ratio respectively. Coated fabrics employing such elastomeric compositions as coating film are flexible, lightweight, and air impermeable and can be made using heat or dielectric sealing procedures.

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

N82-18389* National Aeronautics and Space Administration, Ames Research Center, Moffett Field, Calif.

CARBORANYLCYCLOTRIPHOSPHAZENES AND THEIR POLYMERS Patent

Harry R. Allcock (Pennsylvania State Univ., University Park), John P. O'Brien (Pennsylvania State Univ., University Park), Angelo G. Scopelianos (Pennsylvania State Univ., University Park), and Larry L. Fewell, inventors (to NASA) (Pennsylvania State Univ., University Park) Issued 8 Sep. 1981 4 p Filed 12 Mar. 1980 Supersedes N80-21533 (18 - 12, p 1552) Sponsored by NASA

(NASA-Case-ARC-11176-1; US-Patent-4,288,585; US-Patent-Appl-SN-129799; US-Patent-Class-528-4; US-Patent-Class-528-168; US-Patent-Class-528-6; US-Patent-Class-528-7; US-Patent-Class-568-2; US-Patent-Class-568-4; US-Patent-Class-568-5; US-Patent-Class-528-399) Avail: US Patent and Trademark Office CSCL 07C

Carboranyl-substituted polyphosphazenes are prepared by heat polymerizing a carboranyl halocyclophosphazene at 250 C for about 120 hours in the absence of oxygen and moisture. The cyclophosphazene is obtained by allowing a lithium carborane, e.g., the reaction product of methyl-o-carborane with n-butyllithium in ethyl ether, to react with e.g., hexachlorocyclotriphosphazene at ambient temperatures and in anhydrous conditions. For greater stability in the presence of moisture, the chlorine substituents of the polymer are then replaced by aryloxy or alkoxy groups, such as CF₃CH₂O. The new substantially inorganic polymers are thermally stable materials which produce a high char yield when exposed to extreme temperatures, and can thus serve to insulate less heat and fire resistant substances.

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

N82-18390* National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.

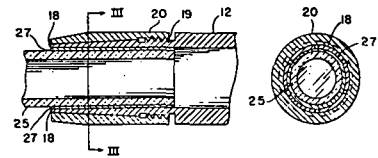
REUSABLE THERMAL CYCLING CLAMP Patent Application

William J. Debnam, Jr., Archibald L. Fripp, and Roger K. Crouch, inventors (to NASA) Filed 17 Nov. 1981, 10 p

(NASA-Case-LAR-12868-1; US-Patent-Appl-SN-322321) Avail: NTIS HC A02/MF A01 CSCL 11A

A reusable metal clamp was developed for retaining a fused quartz ampoule during temperature cycling in the range of 20 C to 1000 C. A compressible graphite foil with a high radial coefficient of thermal expansion is interposed between the fused quartz ampoule and the metal clamp to maintain a snug fit between these components at all temperature levels in the cycle.

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.

N82-12240* National Aeronautics and Space Administration, Pasadena Office, Calif.

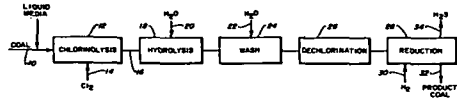
HYDRODESULFURIZATION OF CHLORINATED COAL Patent Application

John J. Kalvinskas (JPL, California Inst. of Technology, Pasadena) and Naresh K. Rohatgi, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 30 Oct. 1981 24 p (Contract NAS7-100)

(NASA-Case-NPO-15304-1; US-Patent-Appl-SN-315587) Avail: NTIS HC A02/MF A01 CSCL 21D

A method of desulfurization is described in which high sulfur coals are desulfurized by low temperature chlorinolysis of coal in liquid media, preferably water, followed by hydrodesulfurization at a temperature above 500 C. The coals are desulfurized to an extent of up to 90% by weight and simultaneously dechlorinated to a chlorine content below 0.1% by weight. The product coals have lower volatile loss, lower oxygen and nitrogen content and

higher fixed carbon than raw coals treated with hydrogen under the same conditions. Heating the chlorinated coal to a temperature above 500 C in inert gas such as nitrogen results in significantly less desulfurization. NASA



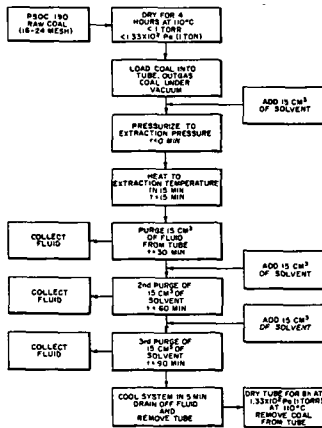
N82-12241* National Aeronautics and Space Administration, Pasadena Office, Calif.

SUPERCRITICAL MULTICOMPONENT SOLVENT COAL EXTRACTION Patent Application

William H. Corcoran, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 30 Oct. 1981 27 p (Contract NAS7-100)

(NASA-Case-NPO-15767-1; US-Patent-Appl-SN-315584) Avail: NTIS HC A03/MF A01 CSCL 21D

The yield of organic extract from the supercritical extraction of coal with larger diameter organic solvents such as toluene is increased by use of a minor amount of from 0.1 to 10% by weight of a second solvent such as methanol having a molecular diameter significantly smaller than the average pore diameter of the coal. NASA



N82-18401* National Aeronautics and Space Administration, Ames Research Center, Moffett Field, Calif.

USE OF GLOW DISCHARGE IN FLUIDIZED BEDS Patent

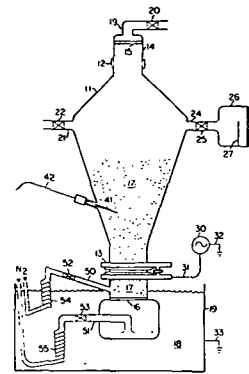
Theodore Wydeven (San Jose State Univ., Calif.), Peter C. Wood (San Jose State Univ., Calif.), Edward V. Ballou (San Jose State Univ., Calif.), and Leroy A. Spitz, inventor (to NASA) (San Jose State Univ., Calif.) Issued 1 Dec. 1981 6 p Filed 26 Oct. 1979 Supersedes N80-11326 (18 - 02, p 0185) Sponsored by NASA

(NASA-Case-ARC-11245-1; US-Patent-4,303,961; US-Patent-Appl-SN-088663; US-Patent-Class-361-230; US-Patent-Class-239-690; US-Patent-Class-361-226) Avail: US Patent and Trademark Office CSCL 21D

Static charges and agglomeration of particles in a fluidized bed systems are minimized by maintaining in at least part of the bed a radio frequency glow discharge. This approach is eminently suitable for processes in which the conventional charge removing agents, i.e., moisture or conductive particle coatings, cannot be used. The technique is applied here to the disproportion-

ation of calcium peroxide diperoxyhydrate to yield calcium superoxide, an exceptionally water and heat sensitive reaction.

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31 ENGINEERING (GENERAL)

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

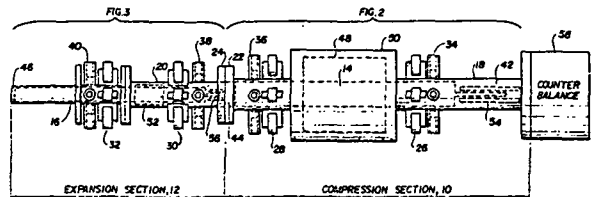
N82-11312* National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

STIRLING CYCLE CRYOGENIC COOLER Patent Application

Allen Sherman, Max G. Gasser, Phillip A. Studer, Michael Goldowsky (Philips Labs., Briarcliff Manor, N.Y.), and Alexander Daniels (Philips Labs., Briarcliff Manor, N.Y.) Filed 2 Oct. 1981 26 p

(NASA-Case-GSC-12697-1; US-Patent-Appl-SN-308204) Avail: NTIS HC A03/MF A01 CSCL 131

A long lifetime Stirling cycle cryogenic cooler particularly adapted for space applications comprised of a compressor section centrally aligned end to end with an expansion section and respectively including a reciprocating compressor piston and displacer radially suspended in interconnecting cylindrical housings by active magnetic bearings and having adjacent reduced clearance regions. One or more of these regions operates as clearance seals. The piston and displacer are reciprocated in their housings by linear drive motors to vary the volume of respectively adjacent compression and expansion spaces which contain a gaseous working fluid and a thermal regenerator to effect Stirling cycle cryogenic cooling. Electrical circuit means are included for energizing the magnetic bearings and for controlling the stroke amplitudes and relative phase angle between the compressor piston and displacer during the cooling cycle. 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.

N82-10286* National Aeronautics and Space Administration. Pasadena Office, Calif.

SYNTHETIC APERTURE RADAR TARGET SIMULATOR Patent Application

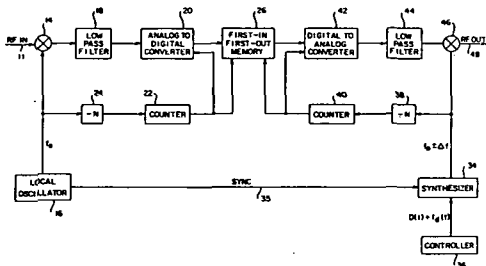
Howard A. Zebker (JPL, California Inst. of Technology, Pasadena), Daniel N. Held (JPL, California Inst. of Technology, Pasadena), Richard M. Goldstein (JPL, California Inst. of Technology, Pasadena), and Thomas C. Bickler, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 17 Jul. 1981 15 p

(Contract NAS7-100)

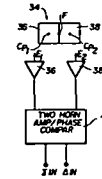
(NASA-Case-NPO-15024-1; US-Patent-Appl-SN-284287) Avail: NTIS HC A02/MF A01 CSCL 171

A simulator for simulating the radar return, or echo, from a target seen by a SAR antenna mounted on a platform moving with respect to the target is described. It includes a first-in first-out memory which has digital information clocked in at a rate related to the frequency of a transmitted radar signal and digital information clocked out with a fixed delay defining range between the SAR and the simulated target, and at a rate related to the frequency of the return signal. An RF input signal having a frequency similar to that utilized by a synthetic aperture array radar is mixed with a local oscillator signal to provide a first baseband signal to provide a first baseband signal having a frequency considerably lower than that of the RF input signal.

T.M.



minimum value of the difference pattern at each step is noted. An indication of the true focal axis is provided by the extreme values of difference signal or the relative phase difference. M.G.



N82-11336* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

CAVITY-BACKED, MICRO-STRIP DIPOLE ANTENNA ARRAY Patent

Haynes Ellis, Jr., inventor (to NASA) (Rockwell International Corp., Downey, Calif.) Issued 1 Sep. 1981 7 p Filed 30 Apr. 1980 Supersedes N80-24511 (18 - 15, p 1969) Sponsored by NASA

(NASA-Case-MS-C-18606-1; US-Patent-4,287,518;

US-Patent-Appl-SN-145206; US-Patent-Class-343-700MS;

US-Patent-Class-343-708; US-Patent-Class-343-795;

US-Patent-Class-343-846; US-Patent-Class-343-727) Avail: US Patent and Trademark Office CSCL 20N

A flush-mounted antenna assembly includes a generally rectangular, conductive, box structure open along one face to form a cavity. Within the cavity a pair of mutually orthogonal dielectric plane surfaces in an 'egg crate' arrangement are mounted normal to the plane of the open face, each diagonally within the cavity. Each dielectric plane supports a pair of printed circuit dipoles typically each fed from the opposite side of the dielectric plane by a printed 'cone-shaped' feed line trace which also serve as an impedance matching device and functions as a balun connected from an unbalanced strip line external feed. The open face of the conductive cavity can be flush mounted with a random thereover, the assembly thereby being flush with the skin of an aircraft or space vehicle.

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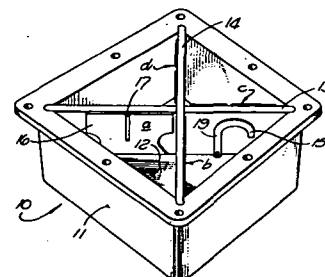
N82-10287* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

FOCAL AXIS RESOLVER FOR OFFSET REFLECTOR ANTENNAS Patent Application

Richard F. Schmidt, inventor (to NASA) Filed 2 Oct. 1981 20 p

(NASA-Case-GSC-12630-1; US-Patent-Appl-SN-308009) Avail: NTIS HC A02/MF A01 CSCL 20N

A method and apparatus for determining the focal axis of an asymmetrical antenna (such as an offset paraboloid reflector) are described. A transmitting feed horn array is located at the known focal point of an offset reflector antenna and aligned with an estimated focal axis of the antenna. The array is coupled to an amplitude or phase comparison feed circuit which is adapted to provide sum and difference output fields. The feed horn array is rotated in discrete steps in at least one plane about an axis through the focal point of the antenna. At each step the far field radiation is received and detected in amplitude and the



N82-12297* National Aeronautics and Space Administration, Pasadena Office, Calif.

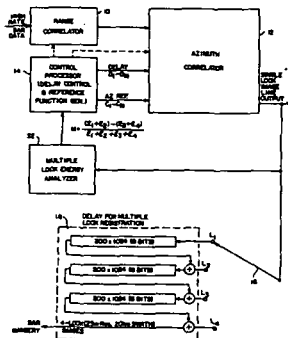
REAL-TIME MULTIPLE-LOOK SYNTHETIC APERTURE RADAR PROCESSOR FOR SPACECRAFT APPLICATIONS Patent

Chialin Wu (JPL, California Inst. of Technology, Pasadena) and Vance C. Tyree, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 29 Sep. 1981 13 p Filed 15 Dec. 1978 Supersedes N79-14278 (17 - 05, p 0585) Sponsored by NASA

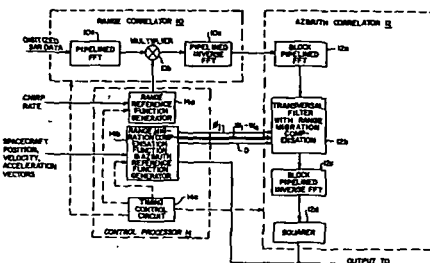
(NASA-Case-NPO-14054-1; US-Patent-4,292,634; US-Patent-Appl-SN-969761; US-Patent-Class-343-5CM) Avail: US Patent and Trademark Office CSCL 171

A spaceborne synthetic aperture radar (SAR) having pipeline multiple-look data processing is described which makes use of excessive azimuth bandwidth in radar echo signals to produce multiple-looking images. Time multiplexed single-look image lines from an azimuth correlator go through an energy analyzer which analyzes the mean energy in each separate look to determine the radar antenna electric boresight for use in generating the correct reference functions for the production of high quality SAR images. The multiplexed single look image lines also go through a registration delay to produce multi-look images.

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



The hybrid processor is comprised of a fast Fourier transform for correlation in the SAR response in the range direction. S.L.



N82-18443* National Aeronautics and Space Administration, Pasadena Office, Calif.

METHOD FOR SHAPING AND AIMING NARROW BEAMS Patent

Richard C. Heyser, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 1 Sep. 1981 9 p Filed 7 Nov. 1979 Supersedes N80-12256 (18 - 03, p 0313)

(NASA-Case-NPO-14632-1; US-Patent-4,287,578; US-Patent-Appl-SN-092143; US-Patent-Class-367-88; US-Patent-Class-367-102; US-Patent-Class-367-100) Avail: US Patent and Trademark Office CSCL 17B

A sonar method and apparatus is described which utilizes a linear frequency chirp in a transmitter/receiver having a correlator to synthesize a narrow beamwidth pattern from otherwise broadbeam transducers when there is relative velocity between the transmitter/receiver and the target. The chirp is so produced in a generator in bandwidth, B, and time, T, as to produce a time bandwidth product, TB, that is increased for a narrower angle. A replica of the chirp produced in a generator is time delayed and Doppler shifted for use as a reference in the receiver for correlation of received chirps from targets. This reference is Doppler shifted to select targets preferentially, thereby to not only synthesize a narrow beam but also aim the beam in azimuth and elevation.

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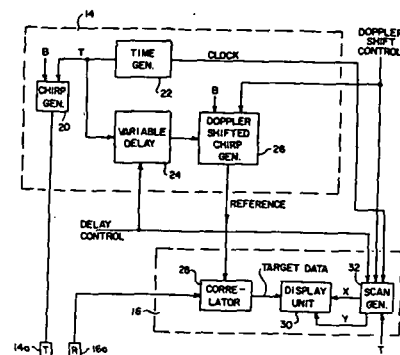
N82-12298* National Aeronautics and Space Administration, Pasadena Office, Calif.

A PIPELINED DIGITAL SAR AZIMUTH CORRELATOR USING HYBRID FFT/TRANSVERSAL-FILTER Patent Application

Chialin Wu (JPL, California Inst. of Technology, Pasadena) and Kuang Y. Liu, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 26 Oct. 1981 41 p (Contract NAS7-100)

(NASA-Case-NPO-15519-1; US-Patent-Class-314-928) Avail: NTIS HC A03/MF A01 CSCL 171

A pipe lined digital signal processor for producing real time high resolution synthetic aperture radar (SAR) images is described.



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.

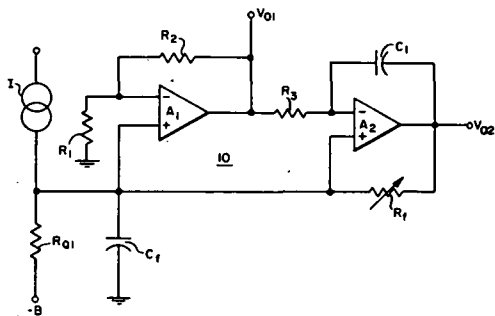
N82-10324*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

TUNED ANALOG NETWORK Patent Application

Everett John Pyle, Jr., inventor (to NASA) Filed 10 Sep. 1981 14 p

(NASA-Case-GSC-12650-1; US-Patent-Appl-SN-301077) Avail: NTIS HC A02/MF A01 CSCL 09C

A non-inverting, direct current amplifier stage is cascaded into an integrator stage to form a two stage tuned network having a single input junction common to both stages. The network provides independent adjustment of center frequency, bandwidth and voltage gain. The insertion of a positive feedback loop between the stages provides a very narrow bandwidth network. The addition of back-to-back Zener diodes between the common input node and ground converts the network into an oscillator. NASA



N82-11357* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

LOW TEMPERATURE LATCHING SOLENOID Patent

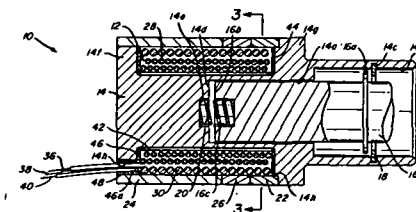
William S. Wang, inventor (to NASA) (Consolidated Controls Corp., El Segundo, Calif.) Issued 13 Oct. 1981 8 p Filed 29 Nov. 1979 Supersedes N80-14338 (18 - 05, p 0597) Sponsored by NASA

(NASA-Case-MSC-18106-1; US-Patent-4,295,111; US-Patent-Appl-SN-098568; US-Patent-Class-335-256; US-Patent-Class-335-266; US-Patent-Class-361-141) Avail: US Patent and Trademark Office CSCL 09A

A magnetically latching solenoid includes a pull-in coil and a delatching coil. Each of the coils is constructed with a combination of wire materials, including material of low temperature coefficient of resistivity to enable the solenoid to be operated at cryogenic temperatures while maintaining sufficient coil resistance. An armature is spring-based toward a first position, that may extend beyond the field of force of a permanent magnet. When voltage is temporarily applied across the pull-in magnet, the induced electromagnetic forces overcome the spring force and pulls the armature to a second position within the field of the permanent magnet, which latches the armature in the pulled-in position. Application of voltage across the delatching coil induces electromagnetic force which at least partially temporarily

nullifies the field of the permanent magnet at the armature, thereby delatching the armature and allowing the spring to move the armature to the first position.

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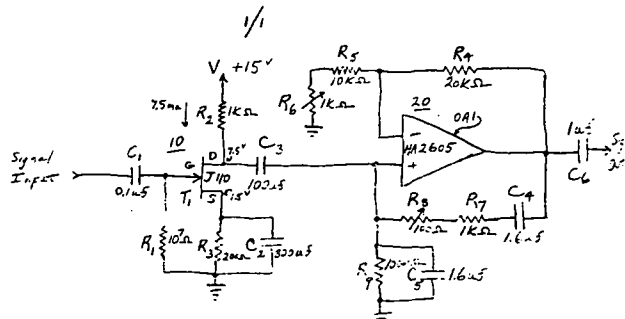
N82-11359*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

LOW NOISE TUNED AMPLIFIER Patent Application

Leonard Klienberg, inventor (to NASA) Filed 12 Jun. 1981 15 p

(NASA-Case-GSC-12567-1; US-Patent-Appl-SN-272839) Avail: NTIS HC A02/MF A01 CSCL 09A

A bandpass amplifier first stage with a resistive load either a.c. or directly coupled to the non-inverting input of an operational amplifier second stage which is loaded in a Wien Bridge configuration. The bandpass amplifier may be operated with a signal injected into the gate terminal of the field effect transistor and the signal output taken from the output terminal of the operational amplifier. The operational amplifier stage appears as an inductive reactance, capacitive reactance and negative resistance at the non-inverting input of the operational amplifier, all of which appear in parallel with the resistive load of the field effect transistor. NASA



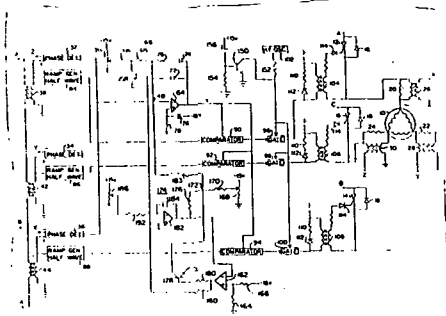
N82-11360*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

MOTOR POWER FACTOR CONTROLLER WITH A REDUCED VOLTAGE STARTER Patent Application

Frank J. Nola, inventor (to NASA) Filed 13 Oct. 1981 17 p (NASA-Case-MFS-25586-1; US-Patent-Appl-SN-310714) Avail: NTIS HC A02/MF A01 CSCL 09A

A power factor type motor controller is disclosed in which the conventional power factor command signal is replaced during a starting interval with a graduated control voltage. This continuation-in-part of a pending patent application

(Serial No. 199, 765: Three Phase Factor Controller) provides a means for modifying the operation of the system for a motor start-up interval of 5 to 30 second. Using a ramp generators, an initial ramp-like signal replaces a constant power factor signal supplied by a potentiometer. The ramp-like signal is applied to a 15 terminal where it is summed with an operating power factor signal from phase detectors in order to obtain a control signal for ultimately controlling SCR devices. The SCR devices are turned on at an advancing rate with time responsive to the combination signal described rather than simply a function of a ramp-like signal alone. NASA

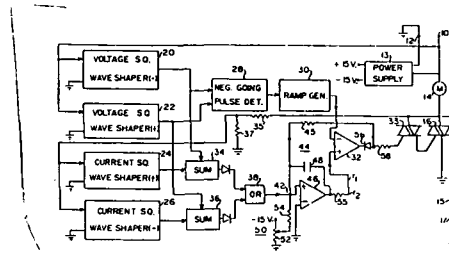


N82-12349*# National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.

A SIMPLIFIED POWER FACTOR CONTROLLER WITH INCREASED ENERGY SAVING CIRCUIT Patent Application

Frank J. Nola, inventor (to NASA) Filed 28 Aug. 1981 12 p (NASA-Case-MFS-25323-1; US-Patent-Appl-SN-297524) Avail: NTIS HC A02/MF A01 CSCL 09A

A device which controls the power input to an induction motor by controlling the power of the motor is disclosed. Two features of the device increase its sensitivity under conditions where the motor is unloaded in order that full control operation is possible with the device adjusted to operate with the power input just sufficient to sustain motor operation. A feedback circuit comprising of a resistor, which feeds back to a summing junction from a signal point at which a triac control signal appears. The requirement that motor current be directly sampled in the process of determining the power factor of the power input to a motor is eliminated. S.I.



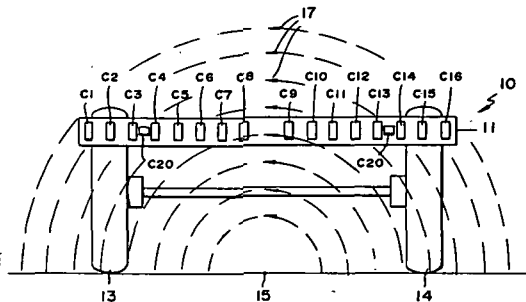
N82-12346*# National Aeronautics and Space Administration, Pasadena Office, Calif.

PHASE SENSITIVE GUIDANCE SENSOR FOR WIRE-FOLLOWING VEHICLES Patent Application

George R. Hansen (JPL, California Inst. of Technology, Pasadena) Filed 30 Oct. 1981 15 p (Contract NAS7-100)

(NASA-Case-NPO-15341-1; US-Patent-Appl-SN-315583) Avail: NTIS HC A02/MF A01 CSCL 09C

A guidance sensor for a wire-following vehicle which is phase sensitive is described. The sensor includes an array of coils positioned to sense the vertical component of a magnetic field produced by the AC current through the guidance wire. The outputs of the coils are fed to associated flip flops. Flip flops associated with coils, through which flux passes in one direction, e.g., up, are driven to one state, e.g., true, and flip flops associated with coils through which flux passes in the opposite direction, e.g., down, are driven to a false state. The control signal to guide the vehicle to be over the wire is a function of the number of flip flops in the true state. Circuitry is included to prevent flip flops from assuming a wrong state due to noise. NASA



N82-16340* National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt Md.

MICROWAVE SWITCHING POWER DIVIDER Patent

Ronald J. Stockton and Russell W. Johnson, inventors (to NASA) Issued 24 Nov. 1981 11 p Filed 12 Mar. 1980 Supersedes N80-21670 (18 - 12, p 1572) Sponsored by NASA

(NASA-Case-GSC-12420-1; US-Patent-4,302,734; US-Patent-Appl-SN-129793; US-Patent-Class-333-104; US-Patent-Class-333-246) Avail: US Patent and Trademark Office CSCL 09C

A pair of parallel, spaced-apart circular ground planes define a microwave cavity with multi-port microwave power distributing switching circuitry formed on opposite sides of a thin circular dielectric substrate disposed between the ground planes. The power distributing circuitry includes a conductive disk located at the center of the substrate and connected to a source of microwave energy. A high speed, low insertion loss switching diode and a dc blocking capacitor are connected in series between the outer end of a transmission line and an output port. A high impedance, microwave blocking dc bias choke is connected between each switching diode and a source of switching current. The switching source forward biases the diodes to couple microwave energy from the conductive disk to selected output ports and, to associated antenna elements connected to the output ports to form a synthesized antenna pattern.

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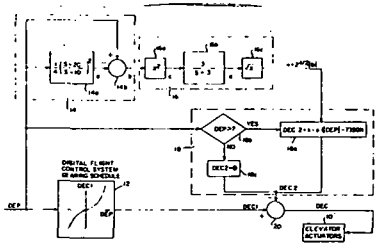


33 ELECTRONICS AND ELECTRICAL ENGINEERING

N82-18493* National Aeronautics and Space Administration, Hugh L. Dryden Flight Research Center, Edwards, Calif.
APPARATUS FOR DAMPING OPERATOR INDUCED OSCILLATIONS OF A CONTROLLED SYSTEM Patent
 John W. Edwards and John W. Smith, inventors (to NASA)
 Issued 3 Nov. 1981 13 p Filed 29 Feb. 1980 Supersedes N80-20488 (18 - 11, p 1409)
 (NASA-Case-FRC-11041-1; US-Patent-4,298,833;
 US-Patent-Appl-SN-126064; US-Patent-Class-318-561;
 US-Patent-Class-318-620; US-Patent-Class-318-621;
 US-Patent-Class-318-622) Avail: US Patent and Trademark Office CSCL 09C

Flight control-related apparatus for damping operator induced oscillations of a controlled system responding to an operator controlled signal is described. The device utilizes a lag-lead filter for frequency and amplitude estimation of the control input, and a rectification and smoothing filter for producing a signal proportional to the absolute value of the frequency and amplitude estimate for use in suppression of the control system output signal. In one embodiment, this is accomplished by computing a correction signal in a correction generating section. In a second embodiment, a second rectification and smoothing filter produces a signal proportional to the absolute value of the controlled input signal. A ratio of the outputs of the first and second rectification and smoothing filters is then used in a generator to generate a gain factor $k_{sub q}$ for the control system to reduce the gain of the output signal of the control system, thereby to provide a damped control output signal without rate limiting the controlled element.

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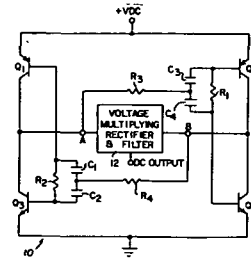


N82-18494* National Aeronautics and Space Administration, Hugh L. Dryden Flight Research Center, Edwards, Calif.
POWER CONVERTER Patent
 James M. Black, inventor (to NASA) Issued 3 Nov. 1981 7 p Filed 29 Jun. 1979 Supersedes N79-27395 (17 - 18, p 2399)
 (NASA-Case-FRC-11014-1; US-Patent-4,298,926;
 US-Patent-Appl-SN-053652; US-Patent-Class-363-132;
 US-Patent-Class-363-61; US-Patent-Class-363-17;
 US-Patent-Class-331-113R) Avail: US Patent and Trademark Office CSCL 09A

A dc-to-dc converter employs four transistor switches in a bridge to chop dc power from a source, and a voltage multiplying diode rectifying ladder network to rectify and filter the chopped dc power for delivery to a load. The bridge switches are cross coupled in order for diagonally opposite pairs to turn on and off together using RC networks for the cross coupling to achieve the mode of operation of a free running multivibrator, and the diode rectifying ladder is configured to operate in a push-pull mode driven from opposite sides of the multivibrator outputs of the ridge switches. The four transistor switches provide a square-wave output voltage which as a peak-to-peak amplitude

that is twice the input dc voltage, and is thus useful as a dc-to-ac inverter.

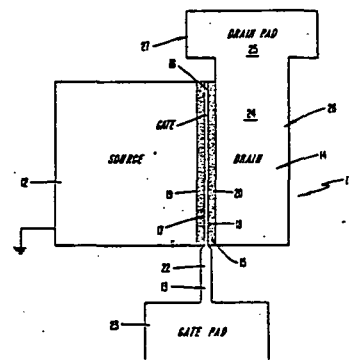
Official Gazette of the U.S. Patent and Trademark Office



N82-20398* National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.
MICROWAVE FIELD EFFECT TRANSISTOR Patent Application
 Ho-Chung Huang, (RCA Corp., New York) Filed 4 Dec. 1981 28 p
 (NASA-Case-GSC-12442-1; US-Patent-Appl-SN-327659) Avail: NTIS HC A03/MF A01 CSCL 09A

Electrodes of a high power, microwave field effect transistor are substantially matched to external input and output networks. This field effect transistor includes a metal ground plane layer, a dielectric active region on the dielectric layer, and substantially coplanar spaced source, gate and drain electrodes having active segments covering the active region. Many of the devices are connected in parallel and share a common active region, so that each pair of adjacent devices share the same source electrodes and each pair of adjacent devices shares the same drain electrodes. The gate electrodes for the parallel devices are formed by a continuous stripe that extends between adjacent devices and is connected at different points to the common gate pad.

NASA



34 FLUID MECHANICS AND HEAT TRANSFER

N82-12345*# National Aeronautics and Space Administration, Pasadena Office, Calif.

MULTIPLE-BEAM, HIGH-POWER, PRECISION POINTING ANTENNA SYSTEM Patent Application

Kenneth E. Woo (JPL, California Inst. of Tech., Pasadena) and Paul W. Cramer, Jr., inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 30 Oct. 1981 16 p

(Contract NAS7-100)

(NASA-Case-NPO-15406-1; US-Patent-Appl-SN-315585) Avail: NTIS HC A02/MF A01 CSCL 09C

An antenna with a plurality of beams that can be electronically steered simultaneously in unison is described. The beams may be steered independently. A relatively small phased array of antenna elements feeding a near field dual reflector system is used to magnify the aperture of the feed array to that of the main reflector thereby providing high gain. The main reflector and the subreflector are shaped reflectors which may be confocal paraboloids having nominally the same focal length to diameter ratio, although the subreflector may be oversized. The array feed is placed so that the subreflector is in the near field of feed.

S.L.

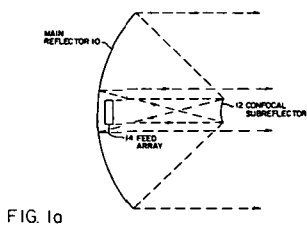


FIG. 1a

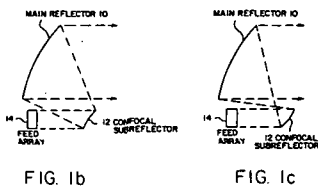
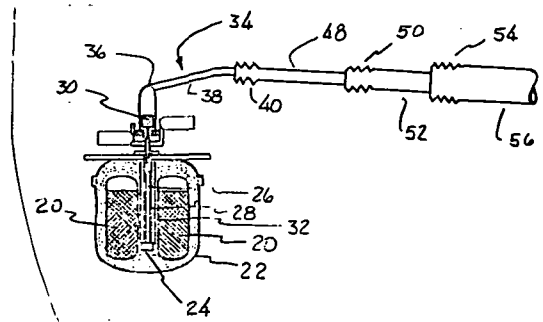


FIG. 1b

FIG. 1c

gels of films of nickel, copper or iron or hydride gels of nickel, copper or iron in a low pressure drop catalytic reactor are suitable for accelerating the endothermic para-to-ortho conversion. NASA



N82-10359*# National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.

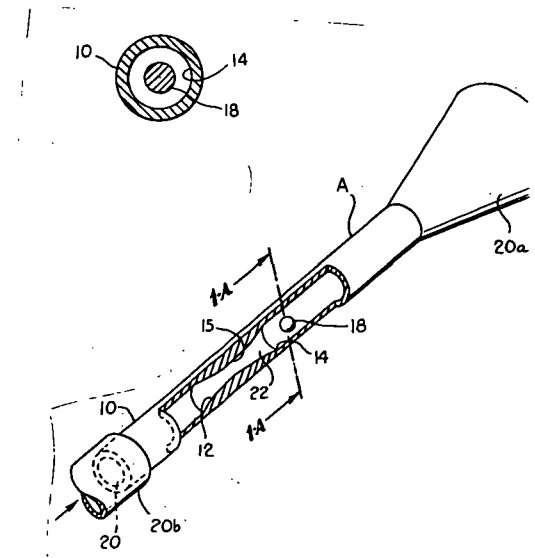
GAS LEVITATOR AND METHOD FOR CONTAINERLESS PROCESSING Patent Application

Leroy H. Berge, William A. Oran, and John M. Theiss, inventors (to NASA) Filed 28 Aug. 1981 17 p

(NASA-Case-MFS-25509-1; US-Patent-Appl-SN-297486) Avail: NTIS HC A02/MF A01 CSCL 20D

An elongated levitation tube having a contoured interior in the form of a convergent section, and a constriction and divergent section, wherein the levitation node is created, is described. Gas flow control means control flow to prevent separation of flow from the interior walls in the region of specimen. An apparatus provides for levitating and heating the specimen simultaneously by combustion of a suitable gas mixture combined with an inert gas.

T.M.



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.

N82-10358*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

COOLING BY CONVERSION OF PARA TO ORTHO-HYDROGEN Patent Application

Allan Sherman, inventor (to NASA) Filed 10 Sep. 1981 14 p

(NASA-Case-GSC-12770-1; US-Patent-Appl-SN-301075) Avail: NTIS HC A02/MF A01 CSCL 20D

The cooling capacity of a solid hydrogen cooling system is significantly increased by exposing vapor created during evaporation of a solid hydrogen mass to a catalyst and thereby accelerating the endothermic para-to-ortho transition of the vapor to equilibrium hydrogen. Catalysts such as nickel, copper, iron or metal hydride

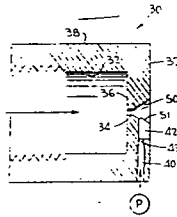
34 FLUID MECHANICS AND HEAT TRANSFER

N82-10360*# National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.
IMPROVED CONSTANT-OUTPUT ATOMIZER Patent Application

Jack Y. Dea, inventor (to NASA) (Desert Research Inst.) Filed 2 Oct. 1981 12 p Sponsored by NASA
 (NASA-Case-MFS-25631-1; US-Patent-Appl-SN-308203) Avail: NTIS HC A02/MF A01 CSCL 20D

A constant-output atomizer is described which includes a generally frustoconical expansion nozzle for producing an air jet. A liquid feed line supplies liquid to be atomized by the air jet, and the body includes a groove which opens into the diffuser section of the nozzle downstream of the throat for conducting liquid from the feed line to the nozzle. The groove extends in a direction perpendicular radially to the axis of the nozzle, and it has a depth approximately equal to half the axial length of the nozzle. Liquid, conducted by capillary action in the groove to the nozzle, is atomized into a fine mist by the air jet in the nozzle; and the groove eliminates fluctuations in spray order.

NASA



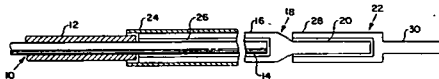
N82-11399*# National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.

HIGH THERMAL POWER DENSITY HEAT TRANSFER Patent Application

James F. Morris, inventor (to NASA) Filed 30 Oct. 1980 10 p
 (NASA-Case-LEW-12950-1; US-Patent-Appl-SN-202228) Avail: NTIS HC A02/MF A01 CSCL 20D

Heat from a high temperature heat pipe is transferred through a vacuum or a gap filled with electrically nonconducting gas to a cooler heat pipe. The heat pipe is used to cool the nuclear reactor while the heat pipe is connected thermally and electrically to a thermionic converter. If the receiver requires greater thermal power density, geometries are used with larger heat pipe areas for transmitting and receiving energy than the area for conducting the heat to the thermionic converter. In this way the heat pipe capability for increasing thermal power densities compensates for the comparatively low thermal power densities through the electrically non-conducting gap between the two heat pipes.

NASA



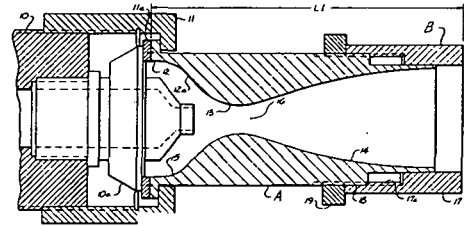
N82-13376*# National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.

CONTROLLED OVERSPRAY SPRAY NOZZLE Patent Application
 Willibald P. Prasthofer, inventor (to NASA) Issued 17 Nov. 1981 6 p Filed 29 Feb. 1980 Supersedes N80-20526 (18-11, p 1415)

(NASA-Case-MFS-25139-1; US-Patent-4,300,723; US-Patent-Appl-SN-126138; US-Patent-Class-239-499; US-Patent-Class-239-589; US-Patent-Class-239-601) Avail: US Patent and Trademark Office CSCL 20D

A spray system for a multi-ingredient ablative material wherein a nozzle A is utilized for suppressing overspray is described. The nozzle includes a cylindrical inlet which converges to a restricted throat. A curved juncture between the cylindrical inlet and the convergent portion affords unrestricted and uninterrupted flow of the ablative material. A divergent bell-shaped chamber and adjustable nozzle exit B is utilized which provides a highly effective spray pattern in suppressing overspray to an acceptable level and producing a homogeneous jet of material that adheres well to the substrate.

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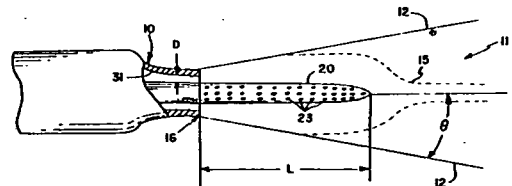
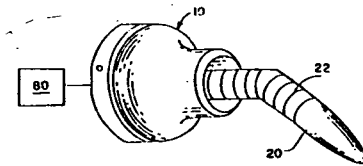
N82-20465*# National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.

APPARATUS AND METHOD FOR JET NOISE SUPPRESSION Patent Application

Lucio Maestrello, inventor (to NASA) Filed 3 Jun. 1981 25 p
 (NASA-Case-LAR-11903-2; US-Patent-Appl-SN-238791) Avail: NTIS HC A02/MF A01 CSCL 20D

A method and apparatus for jet noise suppression through control of the static pressure of the jet and control of the rate of entrainment of ambient fluid into the jet downstream of the exhaust nozzle is discussed. In addition, the momentum flux over an extended region of the jet is regulated. Reynolds stresses and the spreading angle of the jet are affected. Static pressure is controlled through a long hollow, porous nozzle plug centerbody which may be selectively vented to ambient conditions, connected to a vacuum source, or supplied with fluids of various densities for injection into the stream. Additionally, sound in the jet may be channeled along the nozzle plug centerbody by injecting coolant such as a cryogenic fluid through the centerbody into the jet.

NASA



35 INSTRUMENTATION AND PHOTOGRAPHY

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

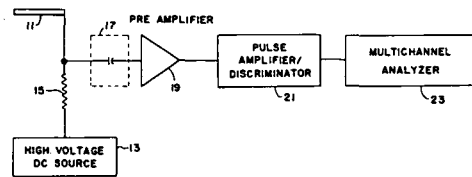
For aerial photography see *43 Earth Resources*. For related information see also *06 Aircraft Instrumentation*, and *19 Spacecraft Instrumentation*.

N82-11431* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SMALL CONDUCTIVE PARTICLE SENSOR Patent
Israel Taback, inventor (to NASA) (Bionetics Corp., Hampton, Va.) Issued 25 Aug. 1981 5 p Filed 28 Aug. 1979 Supersedes N80-11400 (18 - 02, p 0195) Sponsored by NASA (NASA-Case-LAR-12552-1; US-Patent-4,286,209; US-Patent-Appl-SN-070366; US-Patent-Class-324-71CP; US-Patent-Class-235-92PC) Avail: US Patent and Trademark Office CSCL 14B

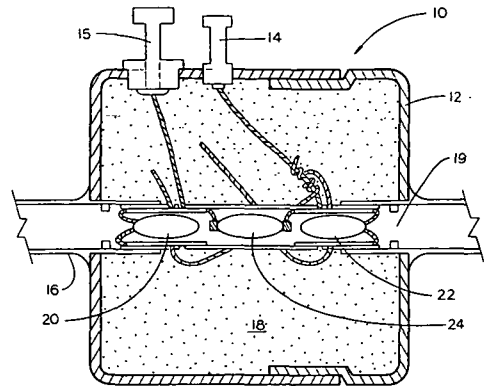
An electrostatic conductive fiber detector is disclosed for use in detecting, counting and measuring the length of fibers down to 0.1 mm and below with increased accuracy and reliability over prior art devices. It can be used for detection of fibers suspending in a flowing gas, in a nonflowing gas, or in a vacuum and its accumulated counts over a period of time is essentially unaffected by velocity of the fibers being detected.

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N82-11436*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
DIRECTIONAL FLOW SENSOR Patent Application
James M. Black, inventor (to NASA) Filed 7 Sep. 1981 13 p (Contract NAS7-100) (NASA-Case-FRC-11074-1; US-Patent-Appl-SN-291644) Avail: NTIS HC A02/MF A01 CSCL 14B

A bidirectional flow sensor comprises at least three axially aligned thermistors, each of which is connected in a normally balanced bridge circuit. The centermost thermistor serves as a heat source for fluid within a tubular body while thermal energy reversely is transferred between the outermost thermistors. Each bridge circuit includes an operational amplifier of a substantially common design with its reversing input connected to the first leg of the bridge circuit and its nonreversing input connected to the second leg. The first leg is characterized by series connected resistances and the thermistor of the rroup for establishing a fixed voltage output ratio for the second leg. The output of voltage for the amplifier of each bridge circuit is indicative of the current required to maintain that temperature of the thermistor which is suitable for maintaining a constant voltage output ratio for the second leg of the bridge circuit. The output voltages of the pair of bridge circuits are applied to the inputs of another operational amplifier and provide for an output indicative of flow rate and direction for the fluid. NASA



N82-11432* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

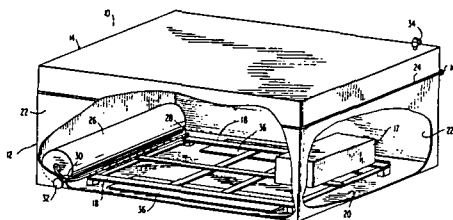
METHOD FOR RETARDING DYE FADING DURING ARCHIVAL STORAGE OF DEVELOPED COLOR PHOTOGRAPHIC FILM Patent

Richard B. Hoover and Charles M. Rhodes, inventors (to NASA) Issued 1 Sep. 1981 4 p Filed 7 Feb. 1980 Supersedes N80-18362 (18 - 09, 1139)

(NASA-Case-MFS-23250-1; US-Patent-4,287,152; US-Patent-Appl-SN-119340; US-Patent-Class-422-40; US-Patent-Class-430-17; US-Patent-Class-430-372) Avail: US Patent and Trademark Office CSCL 14E

Dye fading during archival storage of developed color photographic film is retarded by placing the film in a sealed, opaque vault, introducing a dry, pressurized inert gas into the vault while the latter is vented, and sealing the vault after the air within the vault has been purged and replaced by the inert gas. Preferably, the gas is nitrogen; and the vault is stored at a temperature below room temperature to preserve the color photographic emulsions on the film contained within the vault. For short-term storage, sodium thiocyanate pads charged with water are placed within the vault. For long term storage, the interior of the vault is kept at a low relative humidity.

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



N82-15381* National Aeronautics and Space Administration. Pasadena Office, Calif.

FARADAY ROTATION MEASUREMENT METHOD AND APPARATUS Patent

Milton H. Brockman, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 13 Oct. 1981 10 p Filed 21 Dec. 1979 Supersedes N80-16313 (18 - 07, p 0857) Sponsored by NASA

(NASA-Case-NPO-14839-1; US-Patent-4,295,140; US-Patent-Appl-SN-106119; US-Patent-Class-343-100PE; US-Patent-Class-455-60; US-Patent-Class-455-137; US-Patent-Class-455-139) Avail: US Patent and Trademark Office CSCL 14B

A method and device for measuring Faraday rotation of a received RF signal is described. A simultaneous orthogonal polarization receiver compensates for a 3 db loss due to splitting of a received signal into left circular and right circular polarization channels. The compensation is achieved by RF and modulation arraying utilizing a specific receiver array which also detects and measures Faraday rotation in the presence or absence of spin stabilization effects on a linear polarization vector. Either up-link or down-link measurement of Faraday rotation is possible. Specifically, the Faraday measurement apparatus utilized in conjunction with the specific receiver array provides a means for comparing the phase of a reference signal in the receiver array to the phase of a tracking loop signal related to the incoming signal, and comparing the phase of the reference signal to the phase of the tracking signal shifted in phase by 90 degrees. The averaged and unaveraged signals, are compared, the phase changes between the two signals being related to Faraday rotation.

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

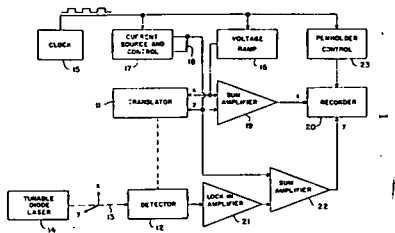
35 INSTRUMENTATION AND PHOTOGRAPHY

N82-18557*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

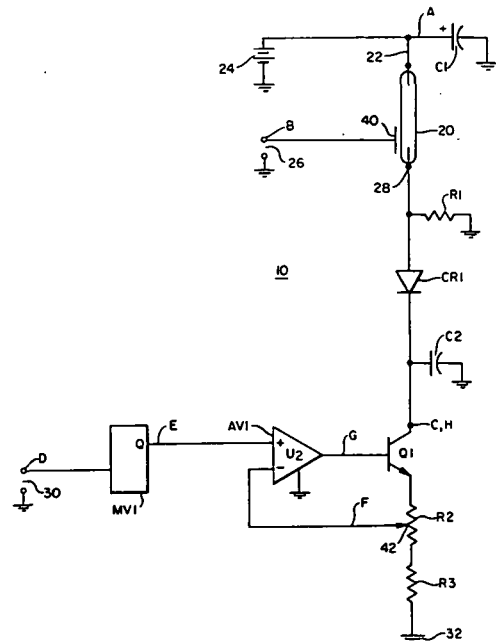
SPATIAL ENERGY DISTRIBUTION Patent Application

Thomas J. Lash, inventor (to NASA) Filed 2 Oct. 1981 10 p (NASA-Case-LAR-12631-1; US-Patent-Appl-SN-308008) Avail: NTIS HC A02/MF A01 CSCL 14B

A system is described in which an X-Y recorder (translator) is modified to automatically scan a detector in a plane perpendicular to the beam of a tunable diode laser to obtain a spatial energy distribution of the beam. The recording pen of a second X-Y recorder is moved in synchronism with the detector and records the output of the detector. Consequently, a recording is made by the second recorder that represents the energy distribution of the beam in the plane scanned by the detector. A step signal is applied to the translator and recorder to move the detector and the recording pen in the Y-direction and is also applied to the X-input of recorder to skew the recording to make it appear to be three-dimensional. NASA



current amplitude to an inventory terminal of the amplifier, thereby controlling the pulse amplitude. The circuit drives the flashlamp to provide a square-wave current flashlamp discharge. NASA



36 LASERS AND MASERS

Includes parametric amplifiers.

N82-10390*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

ACTIVE LAMP PULSE DRIVER CIRCUIT Patent Application

K. Edward Logan, inventor (to NASA) (International Laser Systems, Inc.) Filed 24 Jun. 1981 24 p (NASA-Case-GSC-12566-1; US-Patent-Appl-SN-276748) Avail: NTIS HC A02/MF A01 CSCL 20E

A flashlamp drive circuit is described in detail. The device uses an unsaturated transistor as a current mode switch to periodically subject a partially ionized gaseous laser excitation flash-lamp to a stable, rectangular pulse of current from an incomplete discharge of an energy storage capacitor. A monostable multivibrator sets the pulse interval, initiating the pulse in response to a flash command by providing a reference voltage to a non-inverting terminal of a base drive amplifiers. A tap on an emitter resistor provides a feedback signal sensitive to the

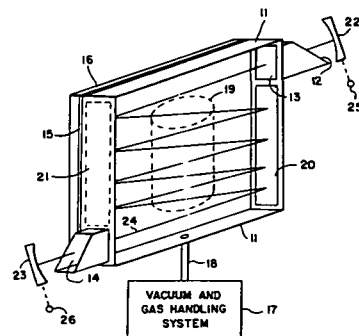
N82-13415* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

LARGE VOLUME MULTIPLE-PATH NUCLEAR PUMPED LASER Patent

Frank Hohl and Russell J. DeYoung, inventors (to NASA) (Miami Univ., Oxford, Ohio) Issued 10 Nov. 1981 4 p Filed 21 May 1979 Supersedes N79-26385 (17 - 17, p 2266) (NASA-Case-LAR-12592-1; US-Patent-4,300,106; US-Patent-Appl-SN-041141; US-Patent-Class-331-94.5C; US-Patent-Class-331-94.5P; US-Patent-Class-331-94.5D) Avail: US Patent and Trademark Office CSCL 20E

Large volumes of gas are excited by using internal high reflectance mirrors that are arranged so that the optical path crosses back and forth through the excited gaseous medium. By adjusting the external dielectric mirrors of the laser, the number of paths through the laser cavity can be varied. Output powers were obtained that are substantially higher than the output powers of previous nuclear laser systems.

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

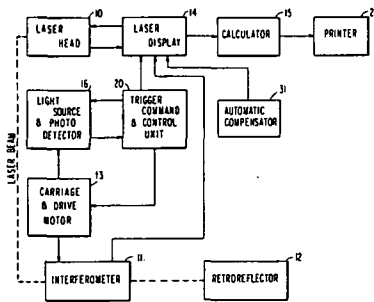


N82-16396* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
LASER MEASURING SYSTEM FOR INCREMENTAL ASSEMBLIES Patent

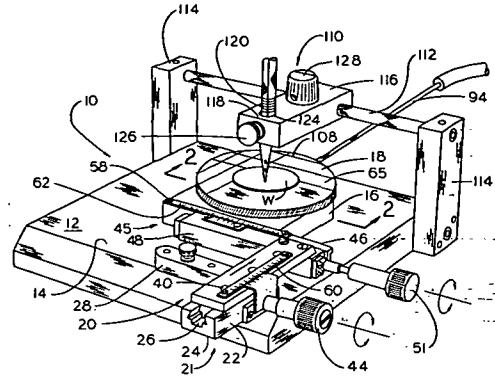
John G. Etzel and James A. Munford, inventors (to NASA) Issued 10 Nov. 1981 6 p Filed 7 Dec. 1979 Supersedes N80-18380 (18 - 09, p 1142)
 (NASA-Case-GSC-12321-1; US-Patent-4,299,492; US-Patent-Appl-SN-102001; US-Patent-Class-356-386; US-Patent-Class-356-349) Avail: US Patent and Trademark Office

Wire-wrapped frame assemblies used in spark chambers and the like can be measured using a system which utilizes a laser, an interferometer, and a retroreflector to precisely measure distance. A light source and a photodetector are located adjacent the incremental assembly and mounted on a movable carriage. The interferometer is also mounted on the movable carriage, while the laser and retroreflector are positioned at either end of the carriage track. The carriage is moved along one edge of the incremental assembly between the retroreflector and the laser, and as the carriage is moved, the light from the light source to the photodetector is interrupted. This produces a trigger command to a control unit which in turn causes a distance measurement to be made. A printout is provided for each sampling trigger command to list such items as ideal position, actual position and amount of error.

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truck. A chuck positioning means is mounted on the base and is connected to the chuck for positioning the chuck relative to the stylus.
 NASA



N82-11470*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

CLAMP-MOUNT DEVICE Patent Application
 Keith H. Clark, inventor (to NASA) Filed 14 Aug. 1981 10 p
 (NASA-Case-MFS-25510-1; US-Patent-Appl-SN-293414) Avail: NTIS HC A02/MF A01 CSCL 131

Equipment can be mounted to an associated I-beam and the like structural member of the type having oppositely extending flanges using a clamp-mount device which comprises a base and a pair of oppositely facing clamping members carried diagonally on the base clamping flanges. Flanges receiving openings facing one another. Lock means are carried diagonally by the base opposite the clamping members to locking the flanges in the clamping members. A resilient hub is carried centrally of the base engaging and biasing a back side of the flanges maintaining same tightly clamped and facilitating use on vertical as well as horizontal members. The base turns about the hub to receive the flanges within the clamping members. Slidable gate latches secure the hinged locks in an upright locking position. The resilient hub includes a recess opening in the base in which a rubber-like pad is depressably and rotatably carried. NASA

37 MECHANICAL ENGINEERING

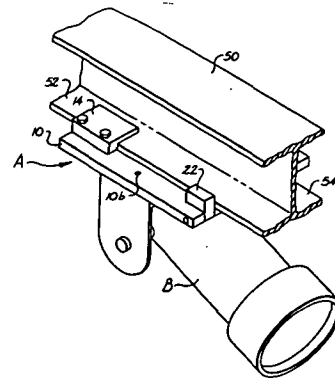
Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

N82-11469*# National Aeronautics and Space Administration. Pasadena Office, Calif.

SCRIBER FOR SILICON WAFERS Patent Application
 Kazuo A. Yamakawa (JPL, California Inst. of Technology, Pasadena) and Edward P. Fortier, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 18 Sep. 1981 17 p
 (Contract NAS7-100)

(NASA-Case-NPO-15539-1; US-Patent-Appl-SN-303670) Avail: NTIS HC A02/MF A01 CSCL 131

A device for dividing silicon wafers into rectangular chips is characterized by a base including a horizontally oriented bed with a planar support surface, a vacuum chuck adapted to capture a silicon wafer seated on the support for translation in mutually perpendicular directions. A stylus support mounted on the bed includes a shaft disposed above and extended across the bed and a truck mounted on the shaft and supported thereby for linear translation along a path extended across the bed. A vertically oriented scribe has a diamond tip supported by the truck also adapted as to engage a silicon wafer captured by the chuck and positioned beneath it in order to form score lines in the surface of the wafer as linear translation is imparted to the



37 MECHANICAL ENGINEERING

N82-12441* National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.

LIQUID IMMERSION APPARATUS FOR MINUTE ARTICLES Patent

Jewell G. Belcher, Jr. and Ben R. Hollis, Jr., inventors (to NASA) Issued 1 Sep. 1981 4 p filed 18 Jul. 1980 Supersedes N80-32585 (18 - 23, p 3121)

(NASA-Case-MFS-25363-1; US-Patent-4,286,542;

US-Patent-Appl-SN-171933; US-Patent-Class-118-423;

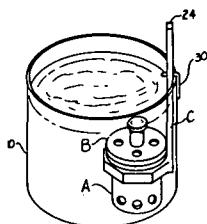
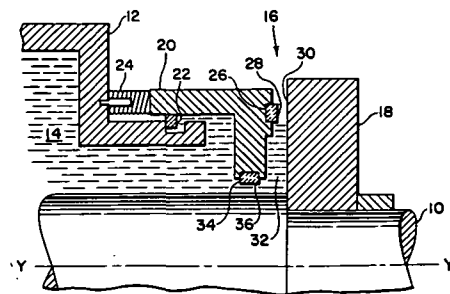
US-Patent-Class-118-500; US-Patent-Class-134-137) Avail: US Patent and Trademark Office CSCL 13D

Apparatus is disclosed for immersing minute integrated circuit chips in an etching solution in manufacturing integrated circuits during research and development. The apparatus includes a holder, having a handle and basket support for carrying a removable unitary basket and lid structure where fluid flow-through passages are formed, and wherein graduated openings in the handle provide for adjustably supporting the basket in a breaker at a desired level.

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

hydrostatic opening face is strongly dependent on the face seal clearance, and the desired axial stiffness is achieved.

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



N82-16408* National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Tex.

SURFACE CONFORMING THERMAL/PRESSURE SEAL Patent

Martin L. Stevens, inventor (to NASA) (Fairchild Republic Co.)

Issued 22 Sep. 1981 9 p Filed 12 Dec. 1979 Supersedes

N80-114400 (18 - 05, p 0605) Sponsored by NASA

(NASA-Case-MSC-18422-1; US-Patent-4,290,612;

US-Patent-Appl-SN-102593; US-Patent-Class-277-81R;

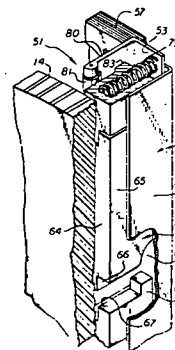
US-Patent-Class-277-189; US-Patent-Class-244-113;

US-Patent-Class-244-217; US-Patent-Class-244-163;

US-Patent-Class-418-113; US-Patent-Class-418-142) Avail: US Patent and Trademark Office CSCL 11A

An assembly is disclosed for sealing a variable gap between the surface of element and a second element in movable relation to it. A seal housing is attached to the second element for movement therewith and has a sealing surface. At least one elongated seal member carried by the housing has first and second conjugate sealing surfaces. The first sealing surface is for rubbing and sealing engagement with the first element surface and the second sealing surface is for sliding and sealing engagement with the housing sealing surface. A biasing assembly may be carried by the housing for biasing the first and second conjugate sealing surfaces of the sealing member toward sealing engagement with the first element surface and housing sealing surface, respectively.

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



N82-12442* National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.

MODIFIED FACE SEAL FOR POSITIVE FILM STIFFNESS Patent

Izhak Etsion (Technion - Israel Inst. of Tech.) and Abraham Lipshitz,

inventors (to NASA) (Technion - Israel Inst. of Tech.) Issued

29 Sep. 1981 4 p Filed 7 Nov. 1979 Supersedes N80-12414

(18 - 03, p 0334) Sponsored by NASA

(NASA-Case-LEW-12989-1; US-Patent-4,291,887;

US-Patent-Appl-SN-092145; US-Patent-Class-277-27;

US-Patent-Class-277-40; US-Patent-Class-277-93R) Avail: US

Patent and Trademark Office CSCL 11A

The film stiffness of a face seal is improved without increasing the sealing and dam area by using an apparatus which includes a primary seal ring in the form of a nose piece. A spring forces a sealing surface on the seal ring into sealing contact with a seat to form a face seal. A circumferential clearance seal is formed in series with this face seal by a lip on the piece. The width of the surface of the lip is substantially the same as the width of the sealing surface on the face seal and the clearance between the surface on the lip and the shaft is substantially the same as the spacing between the face sealing surfaces on the face seal when the shaft is rotating. The circumferential clearance seal restricts the flow of fluid from a main cavity to an intermediate cavity with a resulting pressure drop. The

N82-18601* National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.

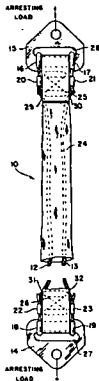
MOVING BODY VELOCITY ARRESTING LINE Patent

Reid A. Hull, inventor (to NASA) Issued 8 Dec. 1981 4 p Filed 28 Dec. 1979 Supersedes N80-18399 (18 - 09, p 1145)

(NASA-Case-LAR-12372-1; US-Patent-4,304,320; US-Patent-AppI-SN-108107; US-Patent-Class-188-371; US-Patent-Class-57-906; US-Patent-Class-244-110C; US-Patent-Class-280-805) Avail: US Patent and Trademark Office CSCL 13I

The arresting of a moving body is improved through the use of steel cables that elongate to absorb the kinetic energy of the body. A sleeve surrounds the cables, protecting them from chafing and providing a failsafe energy absorbing system should the cables fail.

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



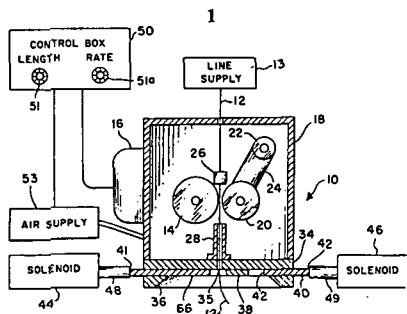
N82-18604*# National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.

PRECISION RECIPROCATING FILAMENT CHOPPER Patent Application

Austin D. McHatton, Arthur L. Newcomb, Jr., and Gregory Schlugge, inventors (to NASA) (Bionetics Corp., Hampton, Va.) Filed 17 Nov. 1981 10 p

(NASA-Case-LAR-12564-2; US-Patent-AppI-SN-322313) Avail: NTIS HC A02/MF A01 CSCL 13I

A chopper for cutting multifilament line is disclosed in which the pull-pull motion of a double edged sliding blade, driven by dual solenoids, provides a chop on each motion. The line is fed by a pair of rollers with one roller being driven. The chopped line length and chop rate are independently controlled. A jet airstream is provided to dispense chopped lengths of line. NASA



N82-19540* National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.

COMPOSITE SEAL FOR TURBOMACHINERY Patent

Robert C. Bill and Lawrence P. Ludwig, inventors (to NASA) Issued 20 Oct. 1981 5 p Filed 20 Nov. 1979 Division of US Patent Appl. SN-931090, filed 8 Aug. 1978, US Patent-4,207,024 which is a division of US Patent Appl. SN-810290, filed 27 Mar. 1977, US Patent-4,135,851

(NASA-Case-LEW-12131-3; US-Patent-4,295,786; US-Patent-4,207,024; US-Patent-4,135,851; US-Patent-AppI-SN-096255; US-Patent-AppI-SN-931090; US-Patent-AppI-SN-801290; US-Patent-Class-415-174; US-Patent-Class-415-196) Avail: US Patent and Trademark Office CSCL 11A

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

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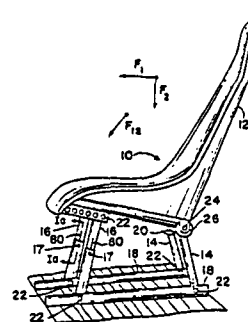
N82-20544*# National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.

VARIABLE RESPONSE LOAD LIMITING DEVICE Patent Application

Dwight D. McSmith, inventor (to NASA) Filed 8 Oct. 1981 18 p

(NASA-Case-LAR-12801-1; US-Patent-AppI-SN-309291) Avail: NTIS HC A02/MF A01 CSCL 13I

An energy absorbing device used as a load limiting member in a structure to control its response to applied loads is described. It functions by utilizing a spool assembly having flanged ends and an interior cavity of sufficiently large diameter to cause it to deform plastically at a prescribed load. In application, the spool is utilized as a pivot point for the legs of an aircraft seat. When properly designed and integrated into the seat arrangement the spool will twist about its axis, deforming plastically when the impact load exceeds the spool yield value. Through this deformation, the spool absorbs the kinetic energy of the movement of the seat at a substantially constant rate, thereby controlling the level of loads transmitted to the seat occupant. By proper sizing and selection of materials, it is possible to control load response in a predictable manner. NASA

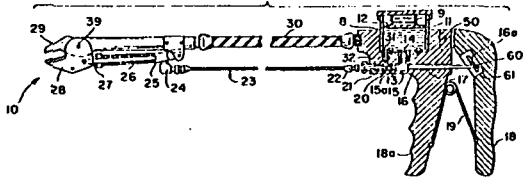


37 MECHANICAL ENGINEERING

N82-20545* National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.
TUBING AND CABLE CUTTING TOOL Patent Application Dwight D. McSmith and James I. Richardson, inventors (to NASA) Filed 6 Oct. 1981 10 p
 (NASA-Case-LAR-12786-1; US-Patent-Appl-SN-309292) Avail: NTIS HC A02/MF A01 CSCL 131

A hand held hydraulic cutting tool was developed which is particularly useful in deactivating ejection seats in military aircraft rescue operations. The tool consists primarily of a hydraulic system composed of a fluid reservoir, a pumping piston, and an actuator piston. Mechanical cutting jaws are attached to the actuator piston rod. The hydraulic system is controlled by a pump handle. As the pump handle is operated the actuator piston rod is forced outward and thus the cutting jaws are forced together. The frame of the device is a flexible metal tubing which permits easy positioning of the tool cutting jaws in remote and normally inaccessible locations. Bifurcated cutting edges ensure removal of a section of the tubing or cable to thereby reduce the possibility of accidental reactivation of the tubing or cable being severed.

NASA



N82-21587* National Aeronautics and Space Administration, Pasadena Office, Calif.
SUSPENSION SYSTEM FOR A WHEEL ROLLING ON A FLAT TRACK Patent

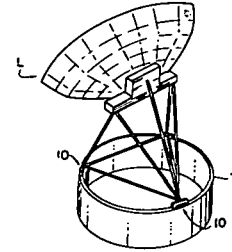
Houston D. McGinness, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 24 Nov. 1981 11 p Filed 17 Nov. 1978 Supersedes N79-12446 (17 - 03, 0333) Sponsored by NASA

(NASA-Case-NPO-14395-1; US-Patent-4,301,740; US-Patent-Appl-SN-961833; US-Patent-Class-105-1A; US-Patent-Class-105-171; US-Patent-Class-105-180; US-Patent-Class-105-218R; US-Patent-Class-248-425; US-Patent-Class-104-83) Avail: US Patent and Trademark Office CSCL 131

An improved suspension system for an uncrowned wheel rolling on a flat track is presented. It is characterized by a wheel frame assembly including a wheel frame and at least one uncrowned wheel connected in supporting relation with the frame. It is adapted to be seated in rolling engagement with a flat

track, a load supporting bed, and a plurality of flexural struts interconnecting the bed in supported relation with the frame. Each of said struts is disposed in a plane passing through the center of the uncrowned wheel surface along a line substantially bisecting the line of contact established between the wheel surface and the flat surface of the truck and characterized by a modulus of elasticity sufficient for maintaining the axis of rotation for the wheel in substantial parallelism with the line of contact established between the surfaces of the wheel and track.

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43 EARTH RESOURCES

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

For instrumentation see 35 Instrumentation and Photography.

N82-13465* National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

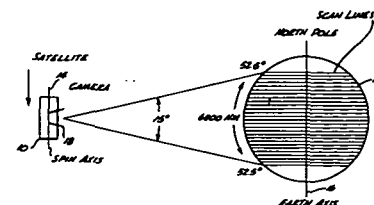
SCANNER Patent

Robert F. Hummer (Santa Barbara Research Center) and Deane T. Upton, inventors (to NASA) (Santa Barbara Research Center) Issued 10 Nov. 1981 12 p Filed 19 May 1975 Supersedes N76-19408 (14 - 10, p 1252) Continuation of abandoned US Patent Appl. SN-583219, filed 30 Sep. 1966 Sponsored by NASA

(NASA-Case-GSC-12032-2; US-Patent-4,300,159; US-Patent-Appl-SN-578700; US-Patent-Appl-SN-583219; US-Patent-Class-358-109; US-Patent-Class-250-235; US-Patent-Class-250-236) Avail: US Patent and Trademark Office CSCL 20F

An aerial vehicle rotating in gyroscopic fashion about one of its axes has an optical system which scans an area below the vehicle in determined relation to vehicle rotation. A sensing device is provided to sense the physical condition of the area of scan and optical means are associated to direct the physical intelligence received from the scan area to the sensing means. Means are provided to incrementally move the optical means through a series of steps to effect sequential line scan of the area being viewed keyed to the rotational rate of the vehicle.

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44 ENERGY PRODUCTION AND CONVERSION

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

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

N82-10496* National Aeronautics and Space Administration, Pasadena Office, Calif.

SOLAR ENERGY MODULATOR Patent Application

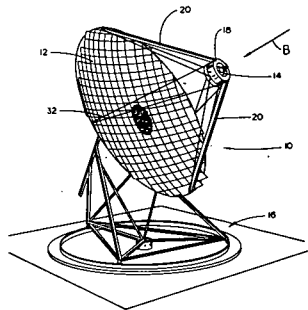
Allan R. McDougal (JPL, California Inst. of Tech., Pasadena) and Robert R. Hale, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 17 Jul. 1981 14 p

(Contract NAS7-100)

(NASA-Case-NPO-15388-1; US-Patent-Appl-SN-284286) Avail: NTIS HC A02/MF A01 CSCL 10A

A module is described with a receiver having a solar energy acceptance opening and supported by a mounting ring along the optic axis of a parabolic mirror in coaxial alignment for receiving solar energy from the mirror, and a solar flux modulator plate for varying the quantity of solar energy flux received by the acceptance opening of the module. The modulator plate is characterized by an annular, plate-like body, the internal diameter of which is equal to or slightly greater than the diameter of the solar energy acceptance opening of the receiver. Slave cylinders are connected to the modulator plate for supporting the plate for axial displacement along the axis of the mirror thereby shading the opening with respect to solar energy flux reflected from the surface of the mirror to the solar energy acceptance opening.

T.M.



N82-16474* National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.

MULTI-CHANNEL TEMPERATURE MEASUREMENT AMPLIFICATION SYSTEM Patent

James R. Currie, inventor (to NASA) Issued 11 Aug. 1981 8 p Filed 29 Nov. 1979 Supersedes N80-17421 (18 - 08, p 1006)

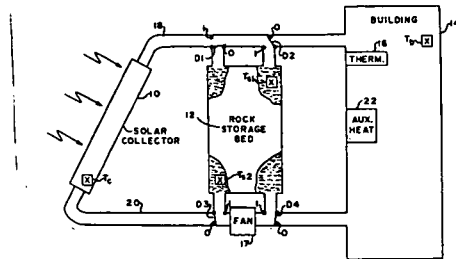
(NASA-Case-MFS-23775-1; US-Patent-4,282,752;

US-Patent-Appl-SN-098569; US-Patent-Class-73-341) Avail: US Patent and Trademark Office CSCL 10C

A number of differential outputs of thermocouples are sequentially amplified by a common amplifier. The amplified outputs are compared with a reference temperature signal in an offset correction amplifier, and a particularly poled output signal

is provided when a differential output is of a discrete level compared with a reference temperature signal.

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N82-16475* National Aeronautics and Space Administration, Pasadena Office, Calif.

SOLAR HEATED FLUIDIZED BED GASIFICATION SYSTEM Patent

Shaik A. Qader, inventor (to NASA) (JPL, California Inst. of Technology Pasadena) Issued 22 Sep. 1981 5 p Filed 15 May 1980 Supersedes N80-24747 (18 - 15, p 2002) Sponsored by NASA

(NASA-Case-NPO-15071-1; US-Patent-4,290,779;

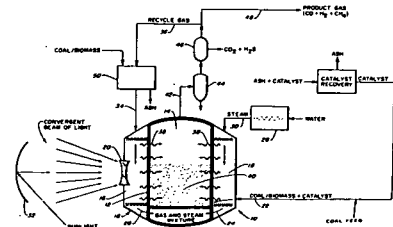
US-Patent-Appl-SN-150115; US-Patent-Class-48-89;

US-Patent-Class-48-99; US-Patent-Class-126-438;

US-Patent-Class-250-527) Avail: US Patent and Trademark Office CSCL 10A

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

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44 ENERGY PRODUCTION AND CONVERSION

N82-18686* National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.

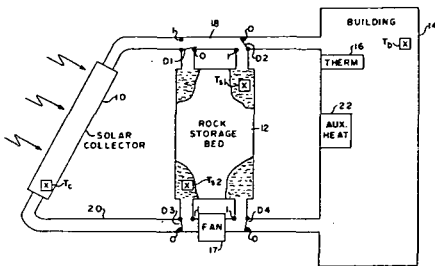
SOLAR ENERGY CONTROL SYSTEM Patent

James R. Currie, inventor (to NASA) Issued 8 Dec. 1981 9 p Filed 20 Nov. 1979 Supersedes N80-17544 (18 - 08, p 1023)

(NASA-Case-MFS-25287-1; US-Patent-4,304,219; US-Patent-Appl-SN-098570; US-Patent-Class-126-422; US-Patent-Class-126-429; US-Patent-Class-126-430) Avail: US Patent and Trademark Office CSCL 04A

A solar energy control system for a hot air type solar energy heating system wherein thermocouples are arranged to sense the temperature of a solar collector, a space to be heated, and a top and bottom of a heat storage unit is disclosed. Pertinent thermocouples are differentially connected together, and these are employed to effect the operation of dampers, a fan, and an auxiliary heat source. In accomplishing this, the differential outputs from the thermocouples are amplified by a single amplifier by multiplexing techniques. Additionally, the amplifier is corrected as to offset by including as one multiplex channel a common reference signal.

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45 ENVIRONMENT POLLUTION

Includes air, noise, thermal and water pollution; environment monitoring; and contamination control.

N82-11634* National Aeronautics and Space Administration, Pasadena Office, Calif.

SEWAGE SLUDGE ADDITIVE Patent

John J. Kalvinskas (JPL, California Inst. of Tech., Pasadena), William A. Mueller (JPL, California Inst. of Tech., Pasadena), and John D. Ingham, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 24 Jun. 1980 5 p Filed 28 Jan. 1976 Sponsored by NASA

(NASA-Case-NPO-13877-1; US-Patent-4,209,393; US-Patent-Appl-SN-652979; US-Patent-Class-210-40; US-Patent-Class-252-422) Avail: US Patent and Trademark Office CSCL 13B

The additive is for a raw sewage treatment process of the type where settling tanks are used for the purpose of permitting the suspended matter in the raw sewage to be settled as well as to permit adsorption of the dissolved contaminants in the water of the sewage. The sludge, which settles down to the bottom of the settling tank is extracted, pyrolyzed and activated to form activated carbon and ash which is mixed with the sewage prior to its introduction into the settling tank. The sludge does not provide all of the activated carbon and ash required for adequate treatment of the raw sewage. It is necessary to add carbon to the process and instead of expensive commercial carbon, coal is used to provide the carbon supplement. T.M.

46 GEOPHYSICS

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

For space radiation see 93 Space Radiation.

N82-12685* National Aeronautics and Space Administration, Pasadena Office, Calif.

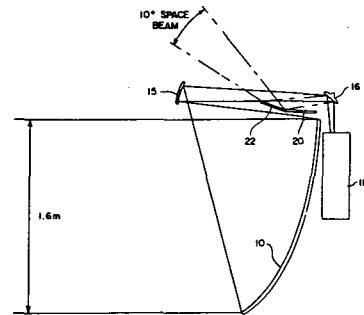
MICROWAVE LIMB SOUNDER Patent

Jacob J. Gustincic, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 4 Aug. 1981 9 p Filed 24 Sep. 1979 Supersedes N79-34014 (17 - 24, p 3285) Sponsored by NASA

(NASA-Case-NPO-14544-1; US-Patent-4,282,525; US-Patent-Appl-SN-078612; US-Patent-Class-343-100ME; US-Patent-Class-343-100PE; US-Patent-Class-343-781P) Avail: US Patent and Trademark Office CSCL 04A

Trace gases in the upper atmosphere can be measured by comparing spectral noise content of limb soundings with the spectral noise content of cold space. An offset Cassegrain antenna system and tiltable input mirror alternately look out at the limb and up at cold space at an elevation angle of about 22. The mirror can also be tilted to look at a black body calibration target. Reflection from the mirror is directed into a radiometer whose head functions as a diplexer to combine the input radiation and a local oscillator (klystron) beam. The radiometer head is comprised of a Fabry-Perot resonator consisting of two Fabry-Perot cavities spaced a number of half wavelengths apart. Incoming radiation received on one side is reflected and rotated 90 deg in polarization by the resonator so that it will be reflected by an input grid into a mixer, while the klystron beam received on the other side is also reflected and rotated 90 deg, but not without passing some energy to be reflected by the input grid into the mixer.

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51 LIFE SCIENCES (GENERAL)

Includes genetics.

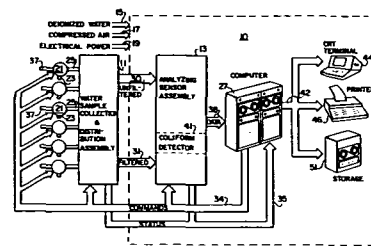
N82-12739*# National Aeronautics and Space Administration, Ames Research Center, Moffett Field, Calif.

METHOD AND APPARATUS FOR DETECTING COLIFORM ORGANISMS Patent Application

Kenji Nishioka, David Nibley (Boeing Co., Palo Alto, Calif.), Eldon Jeffers (Boeing Co., Palo Alto, Calif.), and Richard Brooks, inventors (to NASA) (Boeing Co., Palo Alto, Calif.) Filed 26 Oct. 1981 25 p

(NASA-Case-ARC-11322-1; US-Patent-Appl-SN-315278) Avail: NTIS HC A02/MF A01 CSCL 06C

A sample containing coliform bacteria is cultured in a liquid growth medium. The cultured bacteria produce hydrogen which is vented to a second cell containing a buffer solution in which the hydrogen dissolves. By measuring the potential change in the buffer solution caused by the hydrogen, as a function of time, the initial concentration of bacteria in the sample is determined. Alternatively, the potential change in the buffer solution can be compared with the potential change in the liquid growth medium to verify that the potential change in the liquid growth medium is produced primarily by the hydrogen gas produced by the coliform bacteria. NASA



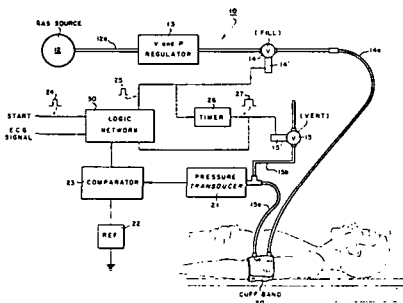
52 AEROSPACE MEDICINE

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

N82-11770* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
LOGIC-CONTROLLED OCCLUSIVE CUFF SYSTEM Patent Joseph T. Baker (Technology, Inc., Houston, Tex.), George W. Hoffer, Inventors (to NASA) (Technology, Inc., Houston, Tex.), and William N. Hursta Issued 13 Oct. 1981 6 p Filed 1 Jun. 1976 Supersedes N76-27839 (14 - 18, p 2369) (NASA-Case-MS-C-14836-1; US-Patent-4,294,261; US-Patent-Appl-SN-691647; US-Patent-Class-128-691; US-Patent-Class-128-327; US-Patent-Class-128-686) Avail: US Patent and Trademark Office CSCL 06B

An occlusive cuff system comprises a pressure cuff and a source of regulated compressed gas feeding the cuff through an electrically operated fill valve. An electrically operated vent valve vents the cuff to the ambient pressure. The fill valve is normally closed and the vent valve is normally open. In response to an external start signal, a logic network opens the fill valve and closes the vent valve, thereby starting the pressurization cycle and a timer. A pressure transducer continuously monitors the pressure in the cuff. When the transducer's output equals a selected reference voltage, a comparator causes the logic network to close the fill valve. The timer, after a selected time delay, opens the vent valve to the ambient pressure, thereby ending the pressurization cycle.

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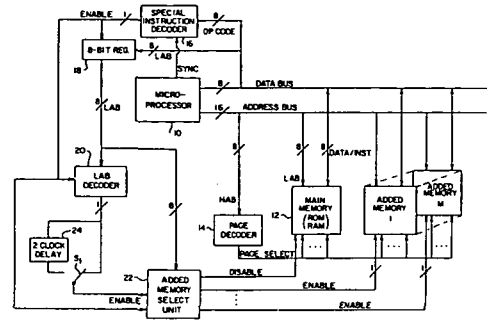
60 COMPUTER OPERATIONS AND HARDWARE

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

N82-11785*# National Aeronautics and Space Administration. Pasadena Office, Calif.
AUTOMATIC MULTI-BANKING OF MEMORY FOR MICRO-PROCESSORS Patent Application Gordon A. Wiker, Inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 7 Aug. 1981 19 p (Contract NAS7-100) (NASA-Case-NPO-15295-1; US-Patent-Appl-SN-291645) Avail: NTIS HC A02/MF A01 CSCL 09B

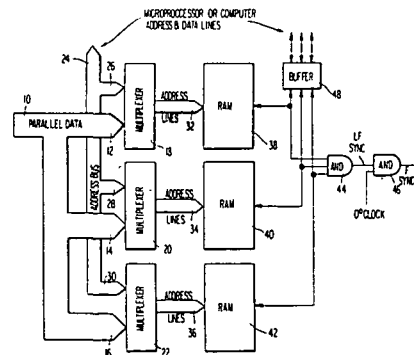
A microprocessor system is provided with added memories to expand its address word length capacity by using indirect addressing instructions of a type having a detectable operations code and dedicating designated address spaces of memory to each of the added memories, one space to a memory. By decoding each operations code of instructions read from main memory into a decoder to identify indirect addressing instructions of the specified type, and then decoding the address that follows in a

decoder to determine which added memory is selectively enabled to permit the instruction to be executed on the location to which the effective address of the indirect address instruction points, either before the indirect address is read from main memory or afterwards, depending on how the system is arranged by a switch. NASA



N82-16747* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MEMORY-BASED FRAME SYNCHRONIZER Patent Raymond J. Stattel and James K. Niswander, inventors (to NASA) Issued 3 Nov. 1981 11 p Filed 12 Mar. 1980 Supersedes N80-20453 (18 - 11, p 1405) (NASA-Case-GSC-12430-1; US-Patent-4,298,987; US-Patent-Appl-SN-129779; US-Patent-Class-375-106; US-Patent-Class-375-114; US-Patent-Class-375-116; US-Patent-Class-370-100) Avail: US Patent and Trademark Office CSCL 09B

A frame synchronizer for use in digital communications systems wherein data formats can be easily and dynamically changed is described. The use of memory array elements provide increased flexibility in format selection and sync word selection in addition to real time reconfiguration ability. The frame synchronizer comprises a serial-to-parallel converter which converts a serial input data stream to a constantly changing parallel data output. This parallel data output is supplied to programmable sync word recognizers each consisting of a multiplexer and a random access memory (RAM). The multiplexer is connected to both the parallel data output and an address bus which may be connected to a microprocessor or computer for purposes of programming the sync word recognizer. The RAM is used as an associative memory or decoder and is programmed to identify a specific sync word. Additional programmable RAMs are used as counter decoders to define word bit length, frame word length, and paragraph frame length. M.G.



71 ACOUSTICS

71 ACOUSTICS

Includes sound generation, transmission and attenuation.

For noise pollution see 45 Environment Pollution.

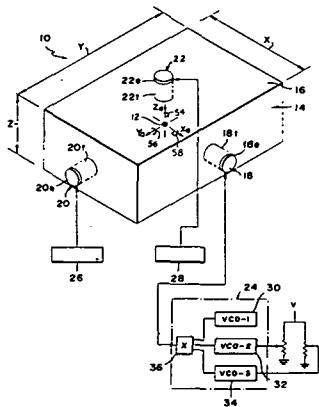
N82-11861* National Aeronautics and Space Administration. Pasadena Office, Calif.

SYSTEM FOR CONTROLLED ACOUSTIC ROTATION OF OBJECTS Patent Application

Martin B. Barmatz, Inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 18 Sep. 1981 15 p (Contract NAS7-100)

(NASA-Case-NPO-15522-1; US-Patent-Appl-SN-303672) Avail: NTIS HC A02/MF A01 CSCL 20A

A system is described for use with acoustically levitated objects, which enables close control of rotation of the object. One system includes transducers that propagate acoustic waves along the three dimensions (X, Y, Z) of a chamber of rectangular cross section. Each transducer generates a first wave which is resonant to a corresponding chamber dimension to acoustically levitate an object, and additional higher frequency resonant wavelengths for controlling rotation of the object. The three chamber dimensions and the corresponding three levitation modes (resonant wavelengths) are all different, to avoid degeneracy, or interference, of waves with one another, that could have an effect on object rotation. Only the higher frequencies, with pairs of them having the same wavelength, are utilized to control rotation, so that rotation is controlled independently of levitation and about any arbitrarily chosen axis. NASA



N82-16800* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

MULTIPLE PURE TONE ELIMINATION STRUT ASSEMBLY Patent

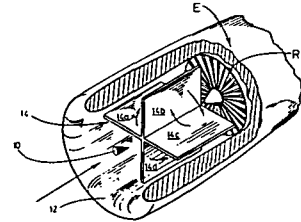
Frank W. Burcham, inventor (to NASA) Issued 17 Nov. 1981 4 p Filed 11 Sep. 1980 Supersedes N80-32393 (18 - 23, p 3094)

(NASA-Case-FRC-11062-1; US-Patent-4,300,656; US-Patent-Appl-SN-185869; US-Patent-Class-181-214) Avail: US Patent and Trademark Office CSCL 20A

An acoustic noise elimination assembly is disclosed which has a capability for disrupting the continuity of fields of sound pressures forwardly projected from fans or rotors of a type commonly found in the fan or compressor first stage for air-breathing engines, when operating at tip speeds in the supersonic range. The assembly includes a tubular cowl defining a duct for delivering an air stream axially into the intake for a jet engine. A sound barrier, defined by a number of intersecting flat plates or struts has a line of intersection coincident with a

longitudinal axis of the tubular cowl, which serves to disrupt the continuity of rotating fields of multiple pure tonal components of noise.

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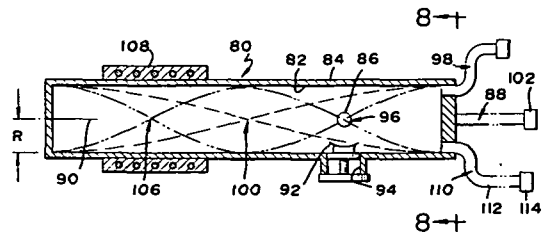
N82-12889* National Aeronautics and Space Administration. Pasadena Office, Calif.

ACOUSTIC SYSTEM FOR MATERIAL TRANSPORT Patent Application

Martin B. Barmatz (JPL, California Inst. of Tech., Pasadena), Eugene Trinh (JPL, California Inst. of Tech., Pasadena), Taylor G. Wang (JPL, California Inst. of Tech., Pasadena), Daniel D. Ellman (JPL, California Inst. of Tech., Pasadena), and Nathan Jacobi, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 26 Oct. 1981 17 p (Contract NAS7-100)

(NASA-Case-NPO-15453-1; US-Patent-Appl-SN-314929) Avail: NTIS HC A02/MF A01 CSCL 20A

An object within a chamber is acoustically moved by applying wavelengths of different modes to the chamber to move the object between pressure wells formed by the modes. In one system, the object is placed in one end of the chamber while a resonant mode, applied along the length of the chamber, produces a pressure well at the location. The frequency is then switched to a second mode that produces a pressure well at the center of the chamber, to draw the object. When the object reaches the second pressure well and is still traveling towards the second end of the chamber, the acoustic frequency is again shifted to a third mode (which may equal the first mode) that has a pressure well in the second end portion of the chamber, to draw the object. A heat source may be located near the second end of the chamber to heat the sample, and after the sample is heated it can be cooled by moving it in a corresponding manner back to the first end of the chamber. The transducers for levitating and moving the object may be all located at the cool first end of the chamber. NASA



73 NUCLEAR AND HIGH-ENERGY PHYSICS

Includes elementary and nuclear particles; and reactor theory.
For space radiation see 93 Space Radiation.

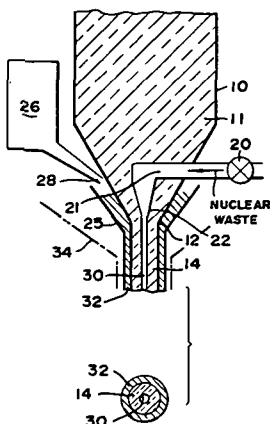
N82-12916* National Aeronautics and Space Administration, Pasadena Office, Calif.

METHOD AND SYSTEM FOR NUCLEAR WASTE DISPOSAL Patent Application

Taylor G. Wang, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 30 Oct. 1981 9 p
(Contract NAS7-100)
(NASA-Case-NPO-15454-1; US-Patent-Appl-SN-315586) Avail: NTIS HC A02/MF A01 CSCL 18G

A method and system for disposing of nuclear waste are described which comprised the encasement of small quantities of waste in spheroids containing lead. The spheroids may be formed of different materials preferably of high compressibility strength, including glass and stainless steel. The spheroids may be formed of any of these materials and coated with or lined by lead.

NASA



74 OPTICS

Includes light phenomena.

N82-10862* National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

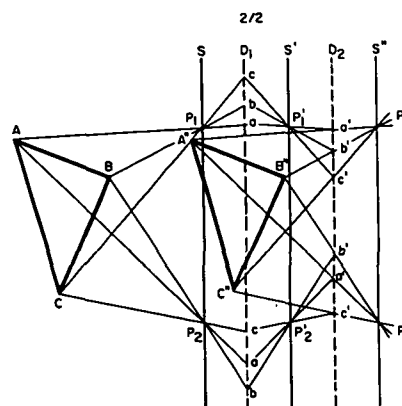
REAL-TIME 3D X-RAY AND GAMMA-RAY VIEWER Patent Application

Lo I. Yin, inventor (to NASA) Filed 22 May 1981 21 p
(NASA-Case-GSC-12640-1; US-Patent-Appl-SN-267178) Avail: NTIS HC A02/MF A01 CSCL 20F

A multi-pinhole aperture lead screen forms an equal plurality of invisible mini-images having dissimilar perspectives of an X-ray and gamma-ray emitting object onto a rare-earth phosphor layer which, in turn, provides visible light mini-images directly into a visible light image intensifier. A viewing screen having an equal plurality of dissimilar perspective apertures distributed across its face in a geometric pattern identical to the lead screen, provides

a viewer with a real, pseudoscopic image of the object with full horizontal and vertical parallax.

NASA



N82-19029* National Aeronautics and Space Administration, Pasadena Office, Calif.

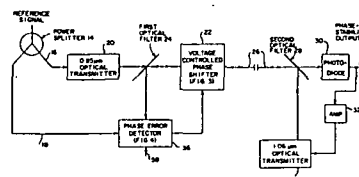
FIBER OPTIC TRANSMISSION LINE STABILIZATION APPARATUS AND METHOD Patent

George F. Lutes, Jr. (JPL, California Inst. of Technology, Pasadena) and Kam Y. Lau, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 1 Sep. 1981 16 p Filed 17 Sep. 1980 Supersedes N80-34250 (18-24, p 3352) Sponsored by NASA

(NASA-Case-NPO-15036-1; US-Patent-4,287,606; US-Patent-Appl-SN-188160; US-Patent-Class-455-617; US-Patent-Class-455-610; US-Patent-Class-455-615; US-Patent-Class-455-612) Avail: US Patent and Trademark Office CSCL 20F

A reference signal of RF frequency modulates a 0.85 micrometer wavelength optical transmitter. The output of which passes through a first optical filter and a voltage-controller phase shifter. The output of the phase shifter is provided to the fiber optic transmission line. At the receiving end of the transmission line, the signal is demodulated and used to modulate a 1.06 micrometer optical transmitter. The signal from the transmitter is provided to the fiber optic transmission line and passes through the voltage-controlled phase shifter to a phase error detector. The phase of the modulation of the 1.06 micrometer wavelength signal is compared to the phase of the reference signal by the phase error detector. A phase control signal related to the phase difference is provided to the voltage controlled phase shifter which alters the phase of both optical signals until a predetermined phase relationship between modulation on the 1.06 micrometer signal and the reference signal is obtained.

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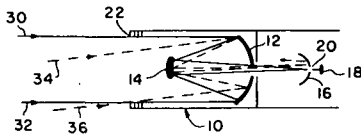
74 OPTICS

N82-19030*# National Aeronautics and Space Administration,
Langley Research Center, Hampton, Va.

HEAT REFLECTING FIELD STOP Patent Application

Wayne A. Massey (TRW Defense and Space Systems Group,
Redondo Beach, Calif.) and Dale L. Massey, Inventors (to NASA)
(TRW Defense and Space Systems Group, Redondo Beach, Calif.)
Filed 30 Oct. 1981 10 p Sponsored by NASA
(NASA-Case-LAR-12443-1; US-Patent-Appl-SN-315582) Avail:
NTIS HC A02/MF A01 CSCL 20F

An apertured field stop with a highly reflective surface is described which reflects unwanted rays outside the instrument in order to minimize internal heating. When the reflective field stop is spherically shaped with a radius of curvature equal to the effective focal length of the host optical instrument, rejected rays are reflected back through the light gathering entrance of the instruments. The heat associated with these rejected rays dissipates outside the instrument in the space surrounding entrance orifice. The reflective field stop proves to be a highly effective device for minimizing the internal heat within optical instruments such as space telescopes used to image the Sun and Earth. This invention can be applied to any small field of view optical system that uses a high intensity source radiation as an input. NASA



1. Report No. NASA SP-7039 (21)	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle NASA PATENT ABSTRACTS BIBLIOGRAPHY A Continuing Bibliography (Supplement 21)		5. Report Date July 1982	
		6. Performing Organization Code	
7. Author(s)		8. Performing Organization Report No.	
9. Performing Organization Name and Address National Aeronautics and Space Administration Washington, D.C. 20546		10. Work Unit No.	
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15. Supplementary Notes Section 1: Abstracts			
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17. Key Words (Suggested by Author(s)) Bibliographies Inventions NASA Programs Patents		18. Distribution Statement Unclassified-Unlimited	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 44	22. Price* \$8.50 HC

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