USSR UDC 547.963.3

VANYUSHIN, B. F., GALIYEV, M. S., KVARATSKHELIYA, M. T., and KOKURINA, N. A., Chair of Plant Biochemistry, Moscow State University imeni M. V. Lomonosov, and Laboratory of Bacterial Fertilizers, All Union Scientific Research Institute of Agricultural Microbiology

"The DNA Composition of Bacillus Megatherium Variants Obtained Through the Action of Certain Phages"

Moscow, Biologicheskiye Nauki, No 5 (89), 1971, pp 82-85

Abstract: A study of the mutability of microorganisms was performed on the basic strains P-57 and 28 of Bacillus megatherium. Mutants were obtained through exposure of these strains to phages and to ultraviolet light. DNA composition was determined by chromatography. While the DNA of the basic Bac. megatherium cultures belong to the AT type and had 41% of GC pairs, mutants 769 and 771 obtained from the P-57 strain by the action of phage PK form wrinkled colonies, and their DNA contains 41.9% and 43.1% GC pairs respectively Through the action of phage 201, dissociation of Bac. megatherium strain 28 can proceed without changes in DNA composition, giving rise to mutant 2875. Similarly, DNA composition in the ultraviolet mutant 122 is identical with that in the basic strain P-57. No methylated bases (5-methylcytosine or N^6-methyladenine) were found in the DNA of any of the above-mentioned cultures.
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USSR G

GALIYEV, Sh. U., IL'GAMOV, M. A., SADYKOV, A. V. Kazan'

"Periodic Shock Waves in a Gas"

Moscow, Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti I Gaza, No 2, March-April 1970, pp 57-66

Abstract: This article contains the results of experimental investigations of longitudinal non-linear oscillations of a gas excited in a closed tube. The amplitudes and profiles of the shock waves are compared with their calculated values at excitation frequencies ω close to the first natural frequency of the gas column $\Omega = \pi a_0/L$ where a_0 is the speed of sound in the unperturbed gas, and L is the length of the tube. The existence of shock waves has been discovered at an excitation frequency half the first natural frequency. The theory based on the method of successive approximations is developed for the latter case. A generalization is presented for excitation frequencies in the vicinity of $\omega = N\Omega$ ($2N = 1,3,5,\ldots$).

The experimental setup and procedure are described, and the readings of a pressure-sensitive sensor at the closed end of tubes 340 and 170 cm long are presented in graphical form for a broad range of excitation frequencies. The experiment shows the low effect of viscosity on the amplitude of the shock waves.

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GALIYEV, SH. U., Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti I Gaza, No 2, March-April 1970, pp 57-66

It is pointed out that whereas oscillations near $\omega = N\pi a_0/L$ ($N = 1,2,3,\ldots$) have been investigated quite thoroughly previously, by repeating the calculations performed in this paper for this case, within the framework of the theory of an ideal liquid it is possible to construct a more exact solution than was found earlier since some new second order variables are considered here, and the boundary condition in the plunger is satisfied for $x = L + l\cos\omega t$ (and not for $x = L$).

1/2 045 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--PERIODIC SHOCK WAVES IN A GAS -U-

AUTHOR-(03)-GALIYEV, SH.U., SADYKOV, A.V., LGAMOV, M.A.

COUNTRY OF INFO--USSR

SOURCE--AKADEMIIA NAUK SSSR, IZVESTIIA, MEKHANIKA ZHIDKOSTI I GAZA, MAR.-APR. 1970, P. 57-66

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--SHOCK WAVE ANALYSIS, SHOCK WAVE FORMATION, SHOCK TUBE, HARMONIC OSCILLATION, SUCCESSIVE APPROXIMATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1198 STEP NO--UR/0421/70/000/003/0057/0066

CIRC ACCESSION NO--AP0124852

UNCLASSIFIED

2/2 045 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0124852

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXPERIMENTAL INVESTIGATION OF LONGITUDINAL NONLINEAR OSCILLATIONS OF A GAS EXCITED IN A CLOSED TUBE. THE AMPLITUDES AND PROFILES OF THE SHOCK WAVES OBTAINED ARE COMPARED WITH THEIR THEORETICAL VALUES FOR EXCITATION FREQUENCIES CLOSE TO THE FIRST NATURAL FREQUENCY OF THE GAS COLUMN. THE EXPERIMENTS REVEALED THE EXISTENCE OF SHOCK WAVES AT AN EXCITATION FREQUENCY ONE HALF THE FIRST NATURAL FREQUENCY. A THEORY IS DEVELOPED FOR THIS CASE, WITH THE AID OF SUCCESSIVE APPROXIMATIONS.

UNCLASSIFIED

UDC 517.946

USSR

GALIYEVA, L. I.

"Boundary Value Problem for a Mixed Fourth-Order Quasilinear Equation"

Uch. zap. Kazan. gos. ped. in-t (Scientific Notes of Kazan State Pedagogical Institute), 1970, No. 83, pp 25-36 (from RZh-Matematika, No 4, Apr 71, Abstract No 4B407)

Translation: In the normal form for the Lavrent'yev-Bitsadze operator

$$L = \partial^2/\partial x^2 + \operatorname{sgn} y \partial^2/\partial y^2$$

of the mixed region D the fourth-order nonlinear equation is considered:

$$L^2 u = LLu = \lambda^2 F(x, y, u). \qquad (1)$$

Under certain restrictions on F and for sufficiently small values of the parameter L the unique solubility of one boundary value problem for equation (1)

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GALIYEVA, L. I., Uch. zap. Kazan. gos. ped. in-t, 1970, No. 83, pp 25-36

is proved when the values of the required function u and Lu are given on the curve-carrier of Tricomi data. A. Nakhushev.

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USSR

UDC: 537.312.62:539.89

GALKIN, A. A., Academician Ukrainian Academy of Sciences; SVISTUNOV, V. M.; CHERNYAK, O. I.; and BELOGOLOVSKIY, M. A.

"Effect of Pressure on the Phonon Impurity Zone of a Pb-In Alloy"

Moscow, Doklady Akademii nauk SSSR, No 4,1 Jun 73, pp 815-817

Abstract: The purpose of this study is to determine experimentally the change of characteristics in the oscillatory spectrum of lead with a slight impurity of indium when the substance is put under pressure. As in experiments executed earlier by the same authors (e.g., Phys. Stat. Sol., 30, KI 07, 1968) fine-film tunnel materials of the superconductor-dielectric-superconductor type, as the most sensitive detectors of changes in density of the material, were used. Methods of preparing these materials and their Al-Al_2O_3-PbIn contacts are described. It is found that under pressure, with a reduction in volume, the phonon spectrum of the metal is shifted in the high-energy direction. An illustration is given of the shift of the second harmonic for an Al-Al_2O_3-$Pb_{0.93}In_{0.07}$ specimen under pressures of zero and 9 kbar. The results of this work were reported to the 17th All-Union Conference on Low-Temperature Physics, held in Donetsk, 26-30 June 1972. The authors thank

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UDC: 537.312.62:539.89

GALKIN, A. A., et al, Doklady Akademii nauk SSSR, No 4, 1973, pp 815-817

V. G. Bar'yakhtar and V. V. Shevtsov for their assistance.

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USSR

GALKIN, A. A., ZAVODSKIY, E. A., Donetsk Physicotechnical Institute, Academy of Sciences of the UkrSSR

"Induction of Magnetic Transformation in Manganese Arsenide by a Strong Magnetic Field"

Leningrad, Fizika Tverdogo Tela, Vol 14, No 6, Jun 72, pp 1752-1755

Abstract: A transition from the ferromagnetic phase α_{FM} to the paramagnetic phase β_{PM} is observed in manganese arsenide at temperature $\Theta_1 \approx 313°K$. It is experimentally found that when $T > \Theta_1$, the transition $\beta_{PM} \rightarrow \alpha_{FM}$ is induced by a considerably higher field than the reverse transition. In the presence of hydrostatic pressure over a wide pressure and temperature range, irreversible $\beta \rightarrow \alpha$ transitions are observed which are induced by a single-acting magnetic pulse field with an intensity of the order of 100 000 oersteds. In order to explain these and other peculiarities of magnetic transformation in MnAs, stable states are computed for various values of H, P, T, and on the basis of the Bean-Rodbell thermodynamic theory. It is concluded that the experimentally observed peculiarities of magnetic transformation at Θ_1 do not contradict the theory.

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UDC 539.3

USSR

GALKIN, A. A., Academician Ukrainian Academy of Sciences, TOKIY, V. V.; ZAYTSEV, V. I.

"Effect of Comprehensive Hydrostatic Pressure on the Interaction of Dislocations"

Moscow, Doklady Akademii Nauk SSSR, Vol 204, No 2, 1972, pp 313-315

Abstract: Earlier papers on this subject of the effect of hydrostatic pressure on dislocations have taken contradictory views, and it is with the intent of reconciling them that the authors of the present paper have investigated the matter. They begin their analysis with an equation for the potential energy of the body under pressure, and they view this quantity energy, as the sum of the characteristic dislocation energies and the deformation field plus the sum of the dislocation energies and the energy causing the deformation field. From the formulas derived in this theoretical article, they find that the pressure increases the interaction between the dislocations and activates the processes which annihilate dislocations of opposite sign. It is noted that their theoretical results agree closely with the experimental results. The authors are connected with the Donetsk Physico-Technical Institute.

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USSR

GALKIN, A. A., ZAVADSKIY, Z. A., SINEL'NIKOV, B. Ya., Donetsk Physicotechnical Institute, Academy of Sciences UkrSSR

"Characteristics of Magnetic Transformation in Chromium Telluride"

Leningrad, Fizika Tverdogo Tela, Vol 14, No 1, Jan 72, pp 157-162

Abstract: The electrical and magnetic properties and the lattice parameters of single-crystal samples of chromium telluride were investigated using magnetic fields up to 12 ke and hydrostatic pressures up to 12 kbar over the temperature range 67-400°K. It is noted that the thermodynamic theory developed by Bean and Rodbell indicates that the transition from the ferromagnetic state to the paramagnetic state may be a first-order phase transition in a ferromagnetic if the compressibility is sufficiently great and the Curie temperature is strongly dependent on pressure. It follows from this theory that this transition should have certain characteristics of a first-order transition; in particular, anomalies in the thermal expansion in the Curie temperature region should be observed and deviations in the temperature dependence of the magnetization from Brillouin should be observed that are caused by the change in the interatomic distance. These deviations should intensify with the growth of temperature and it can be stated that in any ferromagnetic

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GALKIN, A. A., et al., Fizika Tverdogo Tela, Vol 14, No 1, Jan 72, pp 157-162

under a pressure exceeding a certain critical value the transition from ferromagnetism to paramagnetism will be a first-order transition. It was found that anomalies in the crystal lattice parameters, the specific volume, and the coefficient of temperature expansion and compressibility are observed at all pressures in the region of the Curie temperature. These anomalies are more clearly evident with the growth in temperature. The Curie temperature T_c varies linearly with pressure so that $\partial T_c/\partial P = -6$ deg/kbar. Analysis of the experimental results on the basis of the thermodynamic theory of Bean and Rodbell shows that the transition from ferromagnetism to paramagnetism in CrTe at a pressure of the order of 32 kbar must be a first-order phase transition. It is noted that even in a ferromagnetic with a relatively low phase transition coefficient there arise very considerable distortions in the lattice that lead to a deviation of this transition from second-order phase transformations. These deviations are accompanied by changes in the temperature dependence of spontaneous magnetization which are quite considerable, but they need not be considered in any ferromagnetic with a known dependence of the Curie temperature on pressure.

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USSR

UDC 621.735.043.016.3:669.14.018.252.3

CHERNYY, YU. F., ALISTRATOV, L. I., BEREZIN, A. A., GALKIN, A. A., KOVIKO, V. S., KULIKOV, N. I., SPUSKANYUK, V. Z., and SHTOKMAN, A. D.

"Industrial Introduction of Technique of Hydropressing of Tool Billets From Steels R18, R12, R9"

Moscow, Kuznechno-Shtampovochnoye Proizvodstvo, No 8, Aug 71, pp 11-12

Abstract: Experimental investigations at Dnepropetrovsk Physicotechnical Scientific Research Institute, Academy of Sciences Ukrainian SSR, showed that the cold plastic deformation of billets of high-speed steels R18, R12, and R9 by the hydropressing method results in significant refinement and more uniform distribution of the carbide phase. Investigations of R18 steel billets following hydropressing, annealing, and heat finishing showed an increase in the mechanical properties and thermostability of the steel, while production tests of 10-mm-diameter reamers showed a 60-70 percent increase in tool durability. Hydropressing of cylindrical round-section billets from R18, R12, and R9 bars up to 30 mm in diameter has been introduced at one of the

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CHERNYY, YU. F., et al., Kuznechno-Shtampovochnoye Proizvodstvo, No 8, Aug 71, pp 11-12

Donetskaya Oblast plants. A model P479 hydraulic press is used for billet deformation. The hydropressing setup consists of a high-pressure multilayer container, rod and die with gasketing, an upper and lower plate, and a centerer and fastener. The tool billet hydropressing process provides for the preparation of initial billets, straining of the billets,and their subsequent treatment. Kh12M steel (HRC 57-59) is used for the die. The economic advisability of using the technique of high-speed steel hydropressing for the fabrication of tool billets is based mainly on the increased tool duracility as a result of the improved structure and physicomechanical properties of the steel after deformation. There is a saving in high-speed steels because the billet comes as close as possible to the tool size.

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USSR

UDC 539.89

GALKIN, A. A., Academician of the Academy of Sciences of the Ukrainian SSR, DEGTYAR', YE. P., ZHEVAGO, S. YE., and POPOVICH, A. I., Donets Physico-Technical Institute of the Academy of Sciences of the Ukrainian SSR

"The Fermi Surface of Arsenic under Pressure"

Moscow, Doklady Akademii Nauk SSSR, Fizika, Vol 198, No 3, 1971, pp 563-564

Abstract: The authors study the behavior of the giant quantum oscillations and the ordinary quantum oscillations of ultrasonic wave absorption in arsenic at various pressures. Giant quantum oscillations in arsenic are realized on the fine γ-neck of a hole-type Fermi surface proposed by P. J. Lin and L. M. Falicov. The following are considered: 1) the coefficient of sound absorption α in a magnetic field at 0, 2, 4, and 6 kilobars and 2) dependence of the period of oscillation of the sound absorption coefficient on pressure. The results show that when the spin-orbital disintegration becomes sufficient to satisfy the $\lambda < 2(E_c - E_F)$ condition, where E is the energy of degeneration and E_F is Fermi energy, hole-type γ-necks disappear. This was observed by the authors with respect to the disappearance of giant quantum oscillations above 3 kilobars. Original article: three figures and seven bibliographic entries.

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USSR UDC 537.312.62

GAIKIN, A. A., Academician of the Academy of Sciences UkrSSR, BORODAY, B. I. ZIL'BERMAN, L. A., IVANCHENKO, YU. M., SVISTUNOV, V. M., Donets Physicotechnical Institute of the Academy of Sciences UkrSSR

"Role of Low-Frequency Fluctuations in the Josephson Effect"

Moscow, Doklady Akademii Nauk SSSR, Vol 196, No 3, 1971, pp 556-558

Abstract: The role of low-frequency fluctuations which lead to variations in the Josephson current as a function of anomalous current-voltage characteristics and magnetism is discussed. It is noted that for super conducting tunnel systems it is possible to establish phase coherence throught the barrier to ensure tunneling of paired electrons. The presence of fluctuations comparable with the binding energy of the barrier can considerably effect the behavior of Josephson contacts, and many theoretical and experimental studies have been devoted to the effect of thermal fluctuations on the characteristics of superconducting tunneling. Tunnel contacts of the type Sn-I-Sn with specific resistance 0.01-0.02 ohm·mm^2, a high ratio I_{exp}/I_{theor} ~87-92%, and with a dependence of the critical current on the magnetic field close to $\sin \pi H/H_0 / \pi H/H_0$ were studied. For all samples the

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GALKIN, A. A., et al., Doklady Akademii Nauk SSSR, Vol 196, No 3, 1971, pp 556-558

transition width did not exceed twice the Josephson penetration depth ($w \sim 2\lambda_j$). Since fluctuation frequencies were considerably less than the characteristic frequencies of the system, the capacitance C and the inductance L of the tunneling and the external loop could be neglected in order to simplify the calculations. A graph of the effect of low-frequency fluctuations on the variation of Josephson current with magnetism and the initial segments of the current-voltage characteristics for different noise voltages shows that the presence of noise voltages leads to the rise of a resistance state. The experiment showed that noise voltages result in the envelop of oscillations of the superconducting tunnel current in magnetic fields dropping more rapidly than 1/H and ultimately in the oscillations completely disappearing in strong noises. This is said to demonstrate the significance of low-frequency noises in superconducting tunneling.

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UDC 538.2:539.2

USSR

GALKIN, A. A., ZAVADSKIY, E. A., MOROZOV, Ye. M., Donetsk Physicotechnical Institute, Academy of Sciences, Ukrainian SSR

"Magnetic and Structural Transformations in the $Mn_{2-x}A_xB_ySb_{1-y}$ System"

Kiev, Ukrainskiy Fizicheskiy Zhurnal, No 9, September 1970, pp 1440-1445

Abstract: On the basis of results of numerous measurements it is shown that magnetic transformations observed in various subsystems of the $Mn_{2-x}A_xB_ySb_{1-y}$ system are qualitatively identical. In this system can be stabilized not only various magnetic structures with identical lattice symmetry but also a weakly ferromagnetic structure connected with a change of the lattice symmetry. A common model of spin orientations is presented for an undistorted lattice of the system; this model includes a ferrimagnetic structure, an antiferromagnetic structure, and two intermediate magnetic structures that are close to spiral ones. By changing the concentration of alloying elements A or B, the temperature of transition from one structure to another can be changed, and one or several of the magnetic structures can also be excluded. On the basis of analysis of the lattice symmetry is proved the possibility of the formation of a weakly ferromagnetic structure, while by means of magnetic measurements on the basis

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GALKIN, A. A., et al, Ukrainskiy Fizicheskiy Zhurnal, No 9, September 1970, pp 1440-1445

of polycrystalline and textured samples in a wide range of magnetic fields (up to 300 kiloorsted) and by means of electrical measurements, it is shown that such a structure is actually realized in the $Mn_2Ge_ySb_{1-y}$ subsystem. 4 figures, 16 bibliographic entries.

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USSR

GALKIN, A. A.; ZAVADSKIY, E. A. (Donetsk Physics-Engineering Institute, Ukrainian Academy of Sciences)

"Nonequivalence of Atoms in Ferrites"

Moscow, Izvestiya Akademii Nauk SSSR: Seriya Fizicheskaya; May, 1970; pp 940-2

ABSTRACT: The authors offer the hypothesis that the magnetic moment of ions located in crystalographically nonequivalent lattice points must be different if the splitting of the 3d-electron levels not only in the crystalline field but also in the effective Weiss molecular field is taken into account.

A comparison of the experimental values for the magnetization with the theoretical, an analysis of the fields in the nuclei of ferrospinels and garnets, as well as the presence of compensation points in $LiFeTiO_4$ allow one to hypothesize that the magnetic moment of the Fe^{3+} ion at a tetrahedral point is somewhat less than the magnetic moment of the same ion in an octahedral situation. The calculations made for $LiFeTiO_4$ showed that this difference must be close to 0.2 μ_B.

The article includes a figure and two tables. There are four bibliographic references.

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Acc. Nr: AP0043583 GALKIN A.A. Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1970, Vol 58, Nr 2, pp 494-506

LOW FREQUENCY ANTIFERROMAGNETIC RESONANCE IN COPPER CHLORIDE DIHYDRATE AND PHASE TRANSITIONS

V. G. Baryakhtar, A. A. Galkin, S. N. Kovner, V. A. Popov

Antiferromagnetic resonance in a $CuCl_2 \cdot 2H_2O$ single crystal is investigated at frequencies of 5.2, 3.0, 1.1 and 0.65 Gc/s. The dependence of resonance fields corresponding to frequencies 3 and 0.65 Gc/s on temperature is measured at temperatures between 1.52 and 4.2° K. The resonance field corresponding to the frequency 0.65 Gc/s and the larger of the resonance fields corresponding to the frequency 3 Gc/s within the experimental errors vary with temperature just as the overturning field of the sublattice magnetic moments does. The magnetic moment homogeneous oscillation frequencies in an antiferromagnet separated into domains are calculated. A phase equilibrium diagram is proposed for $CuCl_2 \cdot 2H_2O$ in a magnetic field parallel to the «easy» axis. The temperature dependence of the lability fields is calculated in the spin wave theory approximation.

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REEL/FRAME
19762055

1/2 042 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--CONDUCTIVITY ANOMALIES OF TUNNEL JUNCTIONS AL,AL SUB2 O SUB3,BI SUB1-X SB SUBX AT LOW BIAS -U-

AUTHOR-(02)-GALKIN, A.A., IGNATIYEV, O.M.

COUNTRY OF INFO--USSR

SOURCE--UKRAYIN. FIZ. ZH. (USSR), VOL. 15, NO. 5, P. 820-3 (MAY 1970)

DATE PUBLISHED----MAY70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--TUNNEL CURRENT, SEMICONDUCTOR JUNCTION, SEMICONDUCTOR CONDUCTIVITY, CRYOGENIC PROPERTY, HIGH PRESSURE EFFECT, STRONG MAGNETIC FIELD, ALUMINUM, ALUMINUM OXIDE, BISMUTH, ANTIMONY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3005/1801 STEP NO--UR/0185/70/015/005/0820/0823

CIRC ACCESSION NO--AP0133706

UNCLASSIFIED

2/2 042 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0133706

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A DESCRIPTION IS PRESENTED OF ANOMALOUS CONDUCTIVITY OF TUNNEL STRUCTURES AL,AL SUB2 O SUB3,BI SUB1-X SB SUBX AT ZERO BIAS. CONDUCTIVITY WAS MEASURED AT PRESSURES UP TO 10 KATM, TEMPERATURES 4.2-1.8DEGREESK IN MAGNETIC FIELDS UP TO 40 KOE. ANTIMONY CONCENTRATION X IN THE ALLOY OF THE UPPER ELECTRODE IS 10-67 AT. PERCENT. A POSSIBLE MECHANISM IS DISCUSSED OF ANOMALOUS TUNNEL CONDUCTIVITY ARISING AT SMALL BIAS.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--LIMITATION OF TUNNEL CURRENT IN METAL-DIELECTRIC-BISMUTH ANTIMONIDE JUNCTIONS BY CENTRES LOCALIZED NEAR THE INTERFACE BETWEEN THE DIELECTRIC

AUTHOR-(02)-GALKIN, A.A., IGNATYEV, O.M.

COUNTRY OF INFO--USSR

SOURCE--UKRAIN. FIZ. ZHUR., MAR. 1970, 15, (3), 438-440

DATE PUBLISHED--------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., PHYSICS

TOPIC TAGS--TUNNEL CURRENT, ALLOY PN JUNCTION, BISMUTH CONTAINING ALLOY, ANTIMONIDE, DIELECTRIC PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/0201 STEP NO--UR/0185/70/015/000/0438/0440

CIRC ACCESSION NO--AP0129457

UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0129457

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE MECHANISMS GIVING RISE TO THE PECULIAR SHAPE OF THE TUNNEL CURRENT CHARACTERISTIC OF ME DIELECTRIC BI SUB 1-X SB SUBX JUNCTIONS (E.G. AL PER AL SUB2 O SUB3-BI SUB1-X SB SUBX) ARE DISCUSSED. THE SHAPE OF THE CHARACTERISTIC IS DETERMINED BY THE PRESENCE OF FREE BI ATOMS IN THE UPPER ELECTRODE; THESE CREATE LOCAL CAPTURE (TRAPPING) CENTRES IN THE SURFACE LAYER OF THE DIELECTRIC, AND IONIZATION OF THESE LEADS TO THE LIMITATION OF THE TUNNEL CURRENT. THIS EFFECT IS ACCORDINGLY MODIFIED WHEN THE PROPORTION OF SB IN THE BI-SB ALLOY IS INCREASED.

UNCLASSIFIED

1/2 041 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--MAGNETIC TRANSFORMATIONS IN THE MN SUB2 GE SUBY SB SUB1 NEGATIVE SYSTEM IN STRONG MAGNETIC FIELDS UNDER HIGH PRESSURE -U-

AUTHOR-(03)-GALKIN, A.A., ZAVADSKIY, E.A., MOROZOV, E.M.

COUNTRY OF INFO--USSR

SOURCE--PHYSICA STATUS SOLIDI, 1970, VOL 37, NR 2, PP 851-856

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--MAGNETIC TRANSFORMATION, TRANSITION TEMPERATURE, STRONG MAGNETIC FIELD, PRESSURE EFFECT, MAGNETIC STRUCTURE, ENTROPY, SPIN SYSTEM, HIGH PRESSURE, MANGANESE COMPOUND, GERMANIUM COMPOUND, ANTIMONIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/1071 STEP NO--GE/0030/70/037/002/0851/0856

CIRC ACCESSION NO--AP0107580

UNCLASSIFIED

2/2 041 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0107580

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AT TEMPERATURE CHANGES SOME MAGNETIC PHASE TRANSFORMATIONS ARE OBSERVED IN THE MN SUB2 GE SUBY SB SUB1-Y SYSTEM, WHICH ARE ACCOMPANIED BY MAGNETIC STRUCTURE CHANGES. THE MAIN CHARACTERISTICS OF SUCH TRANSFORMATIONS, MAGNETIZATION CHANGE, CHANGE OF THE ENTROPY OF THE SPIN SYSTEM, AND TRANSITION HEAT, WERE DETERMINED ON THE BASIS OF MAGNETIC MEASUREMENTS OVER A WIDE RANGE OF MAGNETIC FIELDS. THE EFFECT OF PRESSURE ON THE MAGNETIC TRANSFORMATION TEMPERATURE WAS ALSO STUDIED. AN ANALYSIS OF THE EXPERIMENTAL RESULTS IS MADE ON THE BASIS OF KITTEL'S EXCHANGE INVERSION THEORY.

FACILITY: PHYSICO-TECHNICAL INSTITUTE OF THE UKRAINIAN ACADEMY OF SCIENCES, DONETSK.

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Crystals & Semiconductors

USSR

GALKIN, A. A., PROKHOROV, A. D., TSINTSADZE, G. A., Donets Physico-technical Institute, Academy of Sciences, Ukrainian SSR

"Co^{2+} Spin-Lattice Relaxation in Monoclinic Tungstenites"

Leningrad, Fizika Tverdogo Tela, Vol 12, No 6, June 1970, pp 1784-1787

Abstract: Measurements of the spin-lattice relaxation of the Co^{2+} ion in $ZnWO_4$ and $CdWO_4$ crystals are carried out in a wide technical range. The temperature relationships of the relaxation times are determined. It is shown that on sectors of the temperature interval the relaxation is described by the mechanisms. An analysis of the results on the basis of a homologic series of monoclinic tungstenites is carried out. The results indicate that in the temperature range characteristic of single-phonon relaxation the environment of the

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GALKIN, A. A., et al, Fizika Tverdogo Tela, Vol 12, No 6, June 1970, pp 1784-1787

magnetic center and its symmetry have little effect upon the process of spin-lattice relaxation, although in this range a substantial part may be played by the presence of defects in the crystals. In the range of higher temperatures the influence of the lattice type and lattice symmetry is explicitly manifested; this can be seen from a comparison of the coefficients for the respective times.

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Superalloys

USSR UDC 669.14.018.45-13:621.771.0.14:539.374

GUN, G. YA., POLUKHIN, P. I., SKUGOREV, V. S., GALKIN, A. N., ZHUCHIN, V. N., ISAYEV, V. A., KARLOV, S. V., and ZAPOROZHTSEV, YU. V., Moscow Institute of Steel and Alloys

"Investigation of the Resistance to Deformation and the Indicators of Plasticity of Heat-Resistant Alloys on a Nickel Base"

Moscow, Izvestiya VUZ, Chernaya Metallurgiya, No 11, 1973, pp 92-97

Abstract: In this article the authors cite the results of an investigation on resistance to deformation of heat-resistant alloys EP199, EP220, and EI929 on a nickel base in wide temperature range and deformation rate. They have constructed curves for the change in the indicators of plasticity in a broad range of temperature-rate conditions of deformation.

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GUN, G. YA., et al., Izvestiya VUZ, Chernaya Metallurgiya, No 11, 1973, pp 92-97

The research was carried out because of the reality at the present time for knowledge of the behavior of materials with respect to resistance to deformation and indicators of plasticity in a range that varies broadly for the temperature and rate of deformation.

The first three illustrations depict curves of deformation resistance of the above alloys as a function of the size and amount of deformation at various temperatures. The fourth figure shows change in values of ψ and δ of these heat-resistant alloys as a function of temperature and rate of deformation.

The article contains four illustrations and 3 bibliographic references.

2/2

UDC 621.777.01

USSR

GUN, G. Ya., POLUKHIN, P. I., SHCHERBEL', R. D., and GALKIN, A. M.

"A Technique for Determining the Stress-Deformation State Under Conditions of Flat Extrusion"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 259-265

Translation: The work considers the question of determining the stress-deformation state under conditions of flat extrusion using flow theory. In determining deformation speeds and hydrostatic pressure in the deformation area, the method of electrodynamic analogies was used. Curves of deformation speeds and stresses in the deformation area were constructed on the basis of the technique developed. The work contains references to experimental confirmation of results obtained. Seven figures and four bibliographic entries.

1/1

UDC 621.777.01

USSR

GUN, G. Ya., SHCHERBEL', R. D., and GALKIN, A. M.

"Calculating the Temperature Field of a Test Piece During Precipitation on a Plastometer"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 172-177

Translation: This article deals with the question of determining the temperature field of a test piece during precipitation on a plastometer. By solving the equation of heat conductivity by numerical and analytical methods, temperature fields are obtained on the basis of the height of the test piece being precipitated at different test speeds and degrees of deformation. In order to confirm the results, an experimental investigation was made on increasing temperature when testing cylindrical specimens made of the AMG6 alloy. Four figures and five bibliographic entries.

1/1

1/2 028 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--CALCULATING THE THERMAL EFFECT OF PLASTIC DEFORMATION IN HIGH VELOCITY TESTS -U-

AUTHOR-(04)-POLUKHIN, P.I., GUN, G.YA., SHCHERBIL, R.D., GALKIN, A.M.

COUNTRY OF INFO--USSR

SOURCE--IZVEST. AKAD. NAUK SSSR, METALLY, MAR.-APR. 1970 (2), 171-175

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--PLASTIC DEFORMATION, THERMAL EFFECT, ALUMINUM ALLOY, MATHEMATIC EXPRESSION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1163 STEP NO--UR/0370/70/000/002/0171/0175

CIRC ACCESSION NO--AP0130191

UNCLASSIFIED

2/2 028 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0130191

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERMAL EFFECTS RESULTING FROM HIGH SPEED PLASTIC DEFORMATION (UPSETTING) OF CYLINDRICAL METAL PARTS ARE DISCUSSED THEORETICALLY. THE TEMP. DISTRIBUTION IN SUCH SAMPLES DIFFERS ONLY SLIGHTLY FROM THAT ASSOCIATED WITH ADIABATIC DEFORMATION. FOR LOW DEFORMATION VELOCITIES THE TEMP. FIELD IS NONUNIFORM. NUMERICAL SOLUTION OF THE EQUATIONS GOVERNING THESE CHANGES TENDS TO MAKE THE SAMPLE TEMP., IN GENERAL, TOO HIGH. IN THE CASE OF THE COMPRESSION OF AL ALLOYS, IN PARTICULAR, THE THERMAL EFFECTS MAY GIVE A FALSE IMPRESSION OF THE DEFORMATION RESISTANCE.

UNCLASSIFIED

USSR UDC: 621.396.6.019.3

GALKIN, A. P.

"Determining the Readiness Factor of Electronic Radio Equipment During the Developmental Stage"

Sb. nauchn. tr. Vladimir. politekhn. in-t (Collected Scientific Works of Vladimir Polytechnical Institute), 1970, vyp. 9, pp 8-11 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5V220)

Translation: A computational formula is derived for use in development of electronic radio equipment to determine the readiness factor at which maximum technical and economic effectiveness is attained for a predetermined operational period. One table, bibliography of four titles.

1/1

USSR

UDC 535.211:539.216.2

URAZALIYEV, U. S., UKRAINSKIY, YU. M., GOMAN'KOV, L. M., and GALKIN, B. D., Moscow

"Crystal Structure and Chemical Composition of Thin Permalloy Films Produced by Laser Radiation Pulses in a Free Generation Mode"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 4, Jul-Aug 73, pp 151-152

Abstract: The crystal structure and chemical composition of thin permalloy films, produced by laser pulse radiation in the mode of free generation, were investigated for films made in a vacuum of 10^{-4} torr using a ruby laser with a pulse energy of approximately 4 joule and pulse time of approximately 450 microseconds. The exceptionally high rate of deposition of the film from laser radiation was noted and the crystal structure of the film resulted from the high kinetic energy of the vaporized atoms and heating of the substrate in the deposition process. It was found that the vacuum efficiency was 1-2 orders higher in laser radiation than in vacuum thermal vaporization and cathode spraying. Two bibliographic references.

1/1

USSR

UDC 621.923.04

ORLOV, P. N., UKRAINSKIY, YU. M., GALKIN, B. D. and SKVORTSOV, K. F.

"The Character of the Surface Layer of Gallium Arsenide After Abrasive Grinding"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy -- Mashinstroyeniye, No 4, 1973, pp 158-161

Abstract: The influence of the process dynamics of the grinding used in preparing layers of gallium arsenide on the depth of the disturbed layer is considered. Using electron diffraction it was concluded that in order to increase productivity it is necessary to use high speeds and acceleration of the grinder on the foundation. On the other hand, in order to obtain a minimal disturbed layer for final polishing low speeds and minimal acceleration are required. These effects are due to the influence of plastic deformation on the process.

1/1

USSR

UDC: 621.396.6-181.5

URAZALIYEV, U. S., IVANOV, R. D., GALKIN, B. D.

"Structure and Formation of Tantalum Thin Films Made by Electron Bombardment"

Elektron. tekhnika. Nauchno-tekhn. sb. Materialy (Electronic Technology. Scientific and Technical Collection. Materials), 1970, vyp. 3, pp 116-117 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12V259)

Translation: The authors give the results of a study of structures and conditions of formation of thin tantalum films made by vaporization using an electron beam. When tantalum is precipitated on cold substrates, the substrate material has no observable effect on the phase composition of the films. The film consists of α-tantalum and tantalum carbide. The film has a "labyrinthine" structure. Oriented crystallization of tantalum is observed with precipitation on heated substrates. The resistivity of the films decreases with an increase in substrate temperature. No β-tantalum is observed in the films. Electron bombardment of the substrate surface changes the conditions of film formation. I. M.

1/1

USSR

UDC 681.325

GALKIN, B. YE., TVERDOKHLEBOVA, I. A., Engineers

"Group Measuring Converters for Centralized Monitoring Systems"

Moscow, Pribory i Sistemy Upravleniya, No 2, Feb 71, pp 47-48

Abstract: This article contains a general discussion of the advantages of group measuring converters for centralized monitoring systems and specific descriptions of the components and overall design and operating characteristics of the GIPI-01I group measuring converter for the VNIIEM-3 centralized monitor designed for operation with 16 sensors connected alternately on command from the centralized monitor.

The GIPI-01I contains a measuring circuit module, two amplifier modules and a commutator module in a waterproof housing for wall mounting. Its basic technical characteristics include the following:

1/3

USSR

GALKIN, B. YE., et al, Pribory i Sistemy Upravleniya, No 2, Feb 71, pp 47-48

Magnitude of unified signal at the output:

Direct current in milliamps	0-5
DC voltage under a load of 2 kilohms, in volts	0-10
Load resistance and converter output in kilohms	2
Basic error under normal conditions for maximum value of converter output signal, in %	±0.5-1.0
Output signal setup time in the presence of a noise filter with a suppression factor of 400 at a frequency of 50 hertz, in milliseconds, no more than	250
Pulsation amplitude of the output signal (for maximum value), in %, no more than	0.2

2/3

USSR

GALKIN, B. YE., et al, Pribory i Sistemy Upravleniya, No 2, Feb 71, pp 47-48

Error on variation of ambient temperature within limits of 5-50°C beginning with 20°C with respect to absolute magnitude of the allowable basic error for each 10°C of temperature variation in %, no more than	0.5
Noise proofness:	
Normal type noise -- voltage with a frequency of 50 hertz (any phase) in volts	to 1
From general type noise -- AC voltage, frequency 50 hertz (any phase) and DC voltage in volts, respectively	to 6 and 10
Feed voltage in volts	220 (50 hertz)
Overall dimensions in mm	512x410x492

3/3

1/2 016 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--PHASE CHANGES IN BARRIER OXIDE FILMS ON ALUMINUM -U-

AUTHOR-(03)-GALKIN, G.I., CHERNYSHEV, V.V., MARKOVA, N.YE.

COUNTRY OF INFO--USSR

SOURCE--ZASHCH. METAL. 1970, 6(2), 209-11

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--OXIDE FILM, ALUMINUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/1549 STEP NO--UR/0365/70/006/002/0209/0211

CIRC ACCESSION NO--AP0120328
UNCLASSIFIED

2/2 016 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0120328

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PURE AL OXIDIZED AT ROOM TEMP. IN A 4PERCENT AQ. H SUB3 BO SUB3 SOLN. AT PH 5.5. AT 40 V, THE OXIDE FILM OBTAINED WAS 500-600 ANGSTROM THICK. THE FILMS WERE SEPD. FROM THE METAL IN A 10PERCENT MEOH SOLN. OF BR AND HEATED IN VACUO FOR 2 HR AT PREDETD. TEMPS. INSULATED FILMS WERE HEATED TO A MAX. TEMP. OF 1000DEGREES AND THE NONINSULATED UP TO 660DEGREES. FILMS THUS OBTAINED WERE AMORPHOUS. THE FILMS WHICH WERE NOT INSULATED FROM THE AL BASE REMIANED AMORPHOUR AFTER HEATING IN VACUO TO TEMPS. BELOW THE M.P. OF AL. WHEN HEATING AT SIMILAR TO 700DEGREES THE FILMS ACQUIRED A CRYST. STRUCTURE. THE INSULATED FILMS RETAINED THEIR AMORPHOUS STRUCTURE AFTER HEATING AT SIMILAR TO 700DEGREES; HOWEVER, AT 700DEGREES SMALL CRYSTALS APPEARED AND THEIR DIFFRACTION RINGS DID NOT CORRESPOND TO THOSE OF GAMMA AL SUB2 O SUB3. HEATING AT 800DEGREES DIMMED THE APPEARANCE OF THE RINGS AND AT 1000DEGREES THEY COMPLETELY DISAPPEARED.

FACILITY: VORONEZH. GOS. UNIV., VORONEZH, USSR.

UNCLASSIFIED

USSR

G

VAVILOV, V. S.; BOBROVA, Ye. A.; GALKIN, G. N. (Lebedev Physics Institute of USSR Academy of Sciences, Moscow)

"Light Reflection in the Infrared Region from Silicon with a High Concentration of Nonequilibrium Carriers"

Leningrad, Solid State Physics; April, 1970; pp 1232-5

ABSTRACT: The variation of the coefficient of reflection R from unalloyed silicon at room temperature on a wave length of 10.6 μ as a function of the level of excitation with a ruby laser was studied. It was observed that with an increase in the level of excitation R decreased from 30 to 19%, then increased to 50%. From data on the minimum on the reflection curve it was possible to draw a conclusion concerning the predominence of electron-hole scattering. A relaxation time on the order of 10^{-14} seconds was obtained for the minimum value of R. The concentration of nonequilibrium carriers $\Delta n = \Delta p = 2 \cdot 10^{19}$ cm^{-3}, corresponding to the minimum on the reflection curve, was determined.

The article includes 5 equations and 2 figures. There are 9 bibliographic references.

1/1

1/2 063 UNCLASSIFIED PROCESSING DATE 20NOV70

TITLE--INFRARED LIGHT REFLECTION FROM SILICON WITH A HIGH CONCENTRATION OF NONEQUILIBRIUM CARRIERS -U-

AUTHOR-(03)-BOBROVA, YE.A., VAVILOV, V.S., GALKIN, G.N.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(4), 1232-5

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--CARRIER LIFETIME, IR LIGHT, LIGHT REFLECTION, SILICON, LIGHT REFLECTION COEFFICIENT, RUBY LASER, LASER EXCITATION, ELECTRON HOLE, ENERGY SCATTERING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1303 STEP NO--UR/0181/70/012/004/1232/1235

CIRC ACCESSION NO--AP0124954
UNCLASSIFIED

2/2 063 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0124954

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. VARIATION WAS INVESTIGATED OF THE REFLECTION COEFF. R FROM UNDOPED SI AT ROOM TEMP. AT 10.6 MU AS A FUNCTION OF THE LEVEL OF EXCITATION WITH A RUBY LASER. WITH INCREASED LEVEL OF EXCITATION A DECREASE IN R WAS OBSD. FROM 30 TO 19PERCENT AND THEN AN INCREASE TO 50PERCENT. DATA ON THE DEPTH OF THE MIN. ON THE REFLECTION CURVE ALLOWED CONCLUDING ABOUT THE PREVAILING ELECTRON HOLE SCATTERING. FROM THE VALUE OF R IN THE MIN. THE RELAXATION TIME WAS EVALUATED; IT IS 10 NEGATIVE PRIME14 SEC. CONCN. WAS DETD. OF NONEQUIL. CARRIER CORRESPONDING TO THE MIN. ON THE REFLECTION CURVE DELTA N EQUALS DELTA P EQUALS 2 TIMES 10 PRIME19-CM PRIME3. FACILITY: FIZ. INST. IM. LEBEDEVA, MOSCOW, USSR.

UNCLASSIFIED

1/2 056 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--EFFICIENCY OF THE RECOMBINATION RADIATION OF LASSER IRRADIATED GERMANIUM -U-

AUTHOR-(02)-BOBROVA, YE.A., GALKIN, G.N.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(2), 368-70

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--RECOMBINATION RADIATION, LASER RADIATION, LASER PULSE, RUBY LASER, GERMANIUM, ETCHED CRYSTAL, RADIATION INTENSITY, RECOMBINATION COEFFICIENT, CARRIER DENSITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0095 STEP NO--UR/0449/70/004/002/0368/0370

CIRC ACCESSION NO--AP0105181

UNCLASSIFIED

2/2 056 UNCLASSIFIED PROCESSING DATE--30OCT70
CIRC ACCESSION NO--AP0105181
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RECOMBINATION RADIATION WAS STUDIED FROM PURE GE (N SUB0, P SUB0 10 PRIME13-CM PRIME3) IRRADIATED BY PULSES (40 NSEC) FROM A RUBY LASER (LAMBEA EQUALS 0.69 MU) WITH INTENSITY OF 5 TIMES 10 PRIME12-5 TIMES 10 PRIME14 KW-CM PRIME2-SEC. THE POLISHED SAMPLES WERE ETCHED BEFORE THE MEASUREMENTS AND THE NONEQUIL. CARRIER CONCN. REACHED 4 TIMES 10 PRIME17-5 TIMES 10 PRIME18-CM PRIME3. THE EFFICIENCY OF THE RADIATION, BETA, UNDER STEADY STATE CONDITIONS IS (0.4-0.7) TIMES 10 PRIME NEGATIVE3 IN THE INTENSITY REGICN STUDIED. THE RECOMBINATION RADIATION IS DUE TO INDIRECT INTERBAND TRANSITIONS. FOR SUCH TRANSITIONS, THE COEFF. OF RADIATIVE RECCMBINATICN IS CALCD. AS 0.65 TIMES 10 PRIME NEGATIVE13 CM PRIME3-SEC. THIS VALUE AGREES WELL WITH THAT OBTAINED FROM EXPT. (0.7 TIMES 10 PRIME NEGATIVE13 CM PRIME3-SEC). UNDER NONSTEADY STATE CONDITIONS, THE CALCD. VALUE OF BETA IS 10 PRIME NEGATIVE2. THE DIFFERENCE BETWEEN THE 2 BETA VALUES IS ASSUMED TO BE ASSOCD, WITH SURFACE RECOMBINATION, WHICH IS NOT TAKEN INTO ACCOUNT IN THE EXPRESSION FOR BETA IN THE LATTER CASE. THE INCREASE IN RADIATION INTENSITY AFTER ETCHING (70-80 TIMES) GIVES EVIDENCE FOR A GREAT EFFECT OF THE SURFACE ON BETA.
FACILITY: FIZ. INST. IM. LEBEDVA, MOSCOW, USSR.

UNCLASSIFIED

Acc. Nr. AA0108180 Abstracting Service: CHEMICAL ABST. 6-70 Ref. Code UR 0482

135549t Steel. Ozerskii, A. D.; Solntsev, Yu. P.; Galkin, M. E.; Myagkov, V. V.; Vladimirov, N. F.; Yurasov, S. A.; Nikonov, V. F.; Yakovenko, A. F.; Parfenovskii, A. B.; Kunitsa, S. S. U.S.S.R. 260,899 (Cl. C 22c), 06 Jan 1970, Appl. 02 Dec 1968; From *Otkrytiya, Izobret., Prom. Obraztsy. Tovarnye Znaki* 1970, 47(4), 81. Steel with improved mech, properties consisted of: C 0.40–0.45, Si 0.5–0.7; Mn 0.5–0.8, Cr 1.5–1.8, V 0.3–0.5, Mo 0.9–1.2, impurities of S <0.03, and P <0.03%, and Fe the remainder. MSCL

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REEL/FRAME

19891846

18 of

USSR

UDC 621.438:536.24

GALKIN, M. N.

"Heat Transfer Problems in Gas Turbines"

Voprosy teploperedachi v gazovykh turbinakh (Tr. Mosk. aviats. tekhnol. in-ta, Vyp. 72) (cf. English above, Works of Moscow Aviation Technological Institute, No. 72), Moscow, "Mashinostroyeniye", 1971, 140 pp, ill, 84 kop. (from RZh-Turbostroyeniye, No 8, Aug 71, Abstract No 8.49.59 K)

Translation: This collection contains the results of theoretical and experimental studies of heat exchange in gas turbines and of the temperature states of turbine blades, discs, and rotors. Boundary conditions used in formulating problems of heat conductivity applicable to gas turbines are analyzed. The results of a generalization of criterial formulas for calculating the heat transfer coefficients in blade lattices are presented. Certain specific problems of heat conductivity for cooled hollow blades and discs are solved in general form and by a numerical method. The collection is intended for specialists in gas turbine design. It is also of interest to teachers and students in this field. 64 ill., 4 tables, 41 ref.

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USSR

UDC 621.438:536.24

GALKIN, M. N.

"Heat Transfer Problems in Gas Turbines"

Voprosy teploperedachi v gazovykh turbinakh (Tr. Mosk. aviats. tekhnol. in-ta, Vyp. 72) (cf. English above, Works of Moscow Aviation Technological Institute, No. 72), Moscow, "Mashinostroyeniye", 1971, 140 pp, ill, 84 kop. (from RZh-Turbostroyeniye, No 8, Aug 71, Abstract No 8.49.59 K)

Translation: This collection contains the results of theoretical and experimental studies of heat exchange in gas turbines and of the temperature states of turbine blades, discs, and rotors. Boundary conditions used in formulating problems of heat conductivity applicable to gas turbines are analyzed. The results of a generalization of criterial formulas for calculating the heat transfer coefficients in blade lattices are presented. Certain specific problems of heat conductivity for cooled hollow blades and discs are solved in general form and by a numerical method. The collection is intended for specialists in gas turbine design. It is also of interest to teachers and students in this field. 64 ill., 4 tables, 41 ref.

1/1

USSR

UDC 669.721.042.6

GALKIN, M. N., KATS, E. L., SPIRIDONOV, YE. V.

"Effect of the Conditions of Formation on the Shrinkage Porosity and Tightness of Castings made of Magnesium Alloys"

Usadochn. protessy v splavakh i otlivkakh -- V sb. (Shrinkage Processes in Alloys and Castings -- collection of works), Kiev, Naukova Dumka Press, 1970, pp 296-301 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G223)

Translation: The results of investigations of the temperature fields of castings during hardening were investigated in order to analyze the process of formation and selection of the technological casting parameters. A mathematical description is presented for the two-dimensional temperature field of cylindrical castings during hardening with correlation to the properties and initial parameters of the mold and cast metal. The probability dependence of the casting tightness on the shrinkage porosity is presented. There are 6 illustrations.

1/1

USSR

GALKIN, M. S., MINAYEV, A. F., POPOVSKIY, V. N.

"Dynamic Aeroelastic Stability of a Flight Vehicle with an Automatic Control System"

4-ya Vses. Konf. po Probl. Ustoychivosti v Stroyit. Mekh., Tezisy Dokl. [Fourth All-Union Conference on Problems of Stability in Structural Mechanics, Theses of Reports -- Collection of Works], Moscow, 1972, pp 151-152, (Translated from Referativnyy Zhurnal, Mekhanika, No 10, 1972, Abstract No 10 V415, from the Resume).

Translation: An elastic flight vehicle of arbitrary design is studied in a stream of air when the control organs are deflected by an automatic control system in response to signals from sensing elements. Thus, a closed system is produced, the stability of which is determined by the transfer functions of its parts. The oscillations and stability of the system in a stream of air are described by ordinary second order differential equations in generalized coordinates. The coefficients of these equations form matrices of inertia, rigidity of the structure, aerodynamic rigidity and aerodynamic damping. A set of computer programs is developed, allowing the elements of the initial matrices to be defined for an arbitrary shape of the structure with N = 40 degrees of freedom. Conversion of the equations of free oscillations can be used to produce transfer functions which relate the displacements at points of attachment of sensing

USSR

GALKIN, M. S., MINAYEV, A. F., POPOVSKIY, V. N., 4-ya Vses. Konf. po Probl. Ustoychivosti v Stroyit. Mekh., Tezisy Dokl., Moscow, 1972, pp 151-152.

elements to deflections of the control organs. The stability of the system is determined by comparing the frequency characteristics of its parts for various levels of input signal. A specific example of investigation of the stability of an aircraft with a short wing is studied. The influence of various parameters is analyzed.

USSR

UDC 621.762.001.669.541.45

PASHCHENKO, I. S., PETROV, G. I., KRAPUKHIN, V. V., SHIGINA, L. N., MINAKOV, A. T., and GALKIN, P. N.

"Study of Certain Properties of GeO_2 and Powdered Germanium"

Kremniy i germaniy [Silicon and Germanium -- collection of works], No. 2, Moscow, Metallurgiya Press, 1970, pp. 67-70, (Translated from Referativnyy Zhurnal-Metallurgiya, No. 1, 1971, Abstract No 1 G429 by the authors).

Translation: The properties of GeO_2 produced by various methods of hydrolysis of $GeCl_4$ are studied. The influence of particle size of GeO_2 and powdered Ge on changes in bulk mass, picnometric density, gas permeability, specific surface, and friability is demonstrated. 4 tables; 6 biblio. refs.

1/1

Analysis and Testing

USSR

GALKIN, R. M., Bereznikovsk Titanium-Magnesium Combine

"Neutron-Activation Method of Determining Micro-Admixtures of Oxygen in Titanium Sponge"

Moscow, Zavodskaya Laboratoriya, Vol 39, No 2, 1973, pp 244-245

Abstract: The neutron-activation method is used on the K-1 unit (All-Union Scientific Research Institute of Magnetic Sound Recording and the Technology of Radio Broadcasting and Television), according to the reaction $^{16}O(n,p)^{16}N$, at the Bereznikovsk Titanium-Magnesium Combine for the determination the exactness of methods of neutron-activation analysis, the sensitivity can be evaluated more expediently by a given formula. The sensitivity of the K-1 unit comprises $3 \cdot 10^{-4}$% by wt. for a neutron flux through the sample of $1 \cdot 10^{7}$ neutron/cm^2·sec. The disagreement with data of other authors is explained. Technical-economic characteristics are presented for the oxygen determination in titanium sponge, including the calculated exactness for samples with 0.04 to 0.05% by wt. of O, on K-1 and VAMI-56 units. The oxygen determination method on the K-1 unit is recommended for inclusion into the All-Union State Standard. One table, four bibliographic references.

1/1

1/2 032 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--APPROACHES TO SELECTION OF PERSONS CAPABLE OF SCIENTIFIC ACTIVITY IN THE FIELD OF MEDICINE IN CONNECTION WITH THE ARTICLE OF E. S.

AUTHOR--GALKIN, V.A.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, SOVETSKOYE ZDRAVOOKHRANENIYE, RUSSIAN, NO 3, 1970, PP 52-54

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--MEDICAL PERSONNEL, PERSONNEL SELECTION, PUBLIC HEALTH, MEDICAL TRAINING, MEDICAL SCIENCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3005/0691 STEP NO--UR/0753/70/000/003/0052/0054

CIRC ACCESSION NO--AP0132805

UNCLASSIFIED

2/2 032 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0132805

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE QUESTIONS RAISED IN E. S. ANTIPENDO'S ARTICLE CONCERNING THE TRAINING OF SCIENTISTS ARE OF INTEREST SINCE, AS THE AUTHOR CORRECTLY EMPHASIZES, THE PROGRESS OF ANY FIELD OF KNOWLEDGE IS IMPOSSIBLE WITHOUT OPTIMUM SOLUTION OF THE PROBLEM OF SCIENTIFIC PERSONNEL. THE DECREE OF THE CC CPSU AND THE COUNCIL OF MINISTERS USSR OF 5 JUNE 1968, ENTITLED "ON MEASURES TO FURTHER IMPROVE PUBLIC HEALTH AND TO DEVELOP MEDICAL SCIENCE IN THE USSR," DESIGNATED THE URGENT TASKS OF PUBLIC HEALTH IN WHOSE PERFORMANCE MEDICAL SCIENCE WILL HAVE AN IMPORTANT ROLE. THE MAIN THING NOW IS TO INCREASE THE EFFECTIVENESS OF SCIENTIFIC RESEARCH IN THE FIELD OF MEDICINE. IN THIS CONNECTION ONE OF THE MOST IMPORTANT TASKS IS RATIONAL AND THE MOST EXPEDIENT PLACEMENT OF PERSONNEL AND THE TRAINING OF HIGHLY QUALIFIED SPECIALIZED SCIENTISTS, TRAINED IN THE SPIRIT OF THE GLORIOUS TRADITIONS OF SOVIET SCIENCE.

UNCLASSIFIED

USSR UDC 539.3:534.1

GALKIN, V. F.

"Certain Experimental Studies of the Effect of the R/δ Ratio and the Yield Point of the Material on the Stability of Cylindrical Shells Under Axial Compression"

V sb. Resheniye nekotor. fiz.-tekhn. zadach (Solution of Certain Physico-technical Problems -- Collection of Works), Dnepropetrovsk, 1972, pp 17-22 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3V348)

Translation: Experimental studies of the loss of stability of cylindrical shells under longitudinal compression are described. The shells were made of soft and cold-worked steel plates of the type Kh18N9, making it possible to evaluate the effect of the magnitude of the proportionality limit on the critical force. The ratio of the length of the shell to the radius was 3. The relationships between the radii R and the thickness δ were expressed in such a way that stability losses occurred in asymmetric form with the formation of rhomboid depressions ($R/\delta > 200$). The considerable effect of the ratio R/δ and the character of the seal (either quality of working of the ends of the shell) on the magnitude of the critical stress of the yield point of the material is noted. 7 ref. L. G. Korneychuk.
1/1

USSR UDC: 621.396.6-181.5(088.8)

FEYGINOV, N. I., GALKOV, V. S.

"A Method of Making Hybrid Integrated Circuits"

USSR Author's Certificate No 283340, filed 13 Jun 69, published 3 Dec 70 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6V199 P)

Translation: A method is proposed for making hybrid integrated microcircuits which is based on producing passive elements on a dielectric plate, connecting the active elements to current-conducting circuit tracks, and dividing up the plate into functional modules. To ensure orientation of the active elements with respect to the points of connection and to automate the assembly process, the active elements are presoldered to lead groups made in a metal plate, from which the active elements are then cut out in sequence together with the leads and attached to the current-conducting circuit tracks while simultaneously moving the plate together with the active and passive elements through a step equal to the spacing of the elements and points of lead attachment.

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1/2 052 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--CERTAIN KINETIC EFFECTS IN CONTINUOUS MEDIA FLOWS -U-

AUTHOR-(03)-GALKIN, V.S., KOGAN, M.N., FRIDLENDER, O.G.

COUNTRY OF INFO--USSR

SOURCE--AKADEMIIA NAUK SSSR, IZVESTIIA, MEKHANIKA ZHIDOSTI I GAZA, MAY-JUNE 1970, P 13-21. 7 REFS.
DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--KNUDSEN PLASMA, GAS DYNAMICS, GAS FLOW, NAVIER STOKES EQUATION, DENSE PLASMA, FLOW KINETICS, ENTHALPY, MACH NUMBER, REYNOLDS NUMBER

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2/2 052 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140021

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DEMONSTRATION OF THE NECESSITY AND VALIDITY OF USING BARNETT'S EQUATIONS AND SLIP CONDITIONS FOR DESCRIBING A WIDE CLASS OF MOTIONS OF A DENSE GAS (AT KNUDSEN NUMBERS APPROACHING ZERO). NAVIER STOKES EQUATIONS WITH ATTACHMENT BOUNDARY CONDITIONS ARE USUALLY VALID FOR DESCRIBING FLOWS OF A DENSE MEDIUM AT KNUDSEN NUMBERS APPROACHING ZERO. IN ORDER TO APPLY THE SOLUTION TOWARD HIGHER KNUDSEN NUMBERS, IT IS CUSTOMARY TO USE SLIP BOUNDARY CONDITIONS AND BARNETT EQUATIONS CONTAINING TERMS OF HIGHER ORDER WITH RESPECT TO THE KNUDSEN NUMBER. HOWEVER, GENERALLY SPEAKING THE RANGE OF APPLICABILITY (IN TERMS OF THE KNUDSEN NUMBER) OF THE BARNETT EQUATIONS IS THE SAME AS THAT OF THE NAVIER STOKES EQUATIONS OS THAT THE USE OF THE BARNETT TERMS YIELDS ONLY SMALL CORRECTIONS. THE PRESENT WORK DIRECTS ATTENTION TO THE EXISTENCE OF CONTINUOUS MEDIUM FLOWS WHOSE DESCRIPTION IN THE FIRST APPROXIMATION REQUIRES THE ALLOWANCE FOR KINETIC EFFECTS (BARNETT TERMS AND SLIP). CONSIDERATION IS GIVEN TO FLOWS WHERE THE CHARACTERISTIC CHANGE IN ENTHALPY IS MUCH LARGER THAN THE CHARACTERISTIC KINETIC ENERGY. DETAILED CALCULATIONS ARE MADE FOR CASES OF SLOW STATIONARY GAS MOTIONS UNDER CONDITIONS WHERE THE MACH AND KNUDSEN NUMBERS APPROACH ZERO AT A REYNOLDS NUMBER SMALLER THAN OR EQUAL TO ZERO. THE INFLUENCE OF THE KINETIC EFFECTS IS DEMONSTRATED FOR THREE ILLUSTRATIVE PROBLEMS.

UNCLASSIFIED

UDC 621.315.592

USSR

GALKIN, V.V., KRASNOPEVTSEV, V.V., MILYUTIN, Yu.V.

"Introduction of Lithium Ions With an Energy of 10-80 Kiloelectron Volts Into Diamonds"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 4, No 5, 1970, pp 837-846

Abstract: In this article the method of light interference was used to investigate imperfections of crystal lattice which occur in a diamond doped by introducing lithium ions with an energy from 20 to 80 kiloelectron volts with doses from 10^{14} to 10^{16} cm^{-2}. It is demonstrated that the doped region consists of two layers with different indexes of refraction. The first layer below the surface contains the basic mass of radiation defects; the thickness of the upper layer is determined by the free path of unchanneled ions, the thickness of which is several times greater than and obviously related to the free path of channeled ions. High temperature treatment leads to annealing of the defects in the case of small radiation doses and to conversion of the strongly damaged region of the diamond into graphite in the case of large radiation doses. Under certain conditions it is possible to observe the ionization region of the ion path. Preliminary data are also presented on the distribution of the electrically introduced active atoms of ^{7}Li with respect to depth. It is pointed out that the measured profile of the total conductivity agrees with the interference measurements.

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USSR

GALKIN, V.V., et al., Fizika i Tekhnika Poluprovodnikov, Vol 4, No 5, 1970, pp 837-846

The sequence of interference peaks with a small period is used to obtain interesting data about the second, deeper layer in the doped diamond. The difficulties involved in quantitative determination of the thickness of this layer and its index of refraction are discussed. It is concluded that the formation of a significant number of radiation defects constitutes a satisfactory explanation for the variation in index of refraction of diamond subjected to bombardment by lithium ions. The mechanism of this effect is discussed in some detail.

2/2

GALKIN, Yu.A.

METALLURGY

JPRS 61521, 26 Feb 74

(2)

FEATURES OF PHYSICO-CHEMICAL PROCESSES FOR PLASMA REDUCTION OF COMPOSITION MATERIALS

[Article by N. N. Rykalin, M. Kh. Shorshorov, V. V. Kuznetsov, Yu. A. Galkin, Moscow, Plazmennyye Protsessy v Metallurgii i Tekhnologii Neorganicheskikh Materialov, Russian, 1973, pp 167-196]

Plasma technology assists in the development of fundamentally new materials, the properties of which may exceed by more than one order of magnitude the properties of familiar and widely employed materials. The need for materials with unusual properties increased and is steadily increasing today in connection with the development of new industries, characterized by a rapid increase of operational loads, temperatures, environmental aggressiveness, etc. The requirements on refractoriness, heat resistance, rigidity and tensile strength of construction materials increase accordingly. The familiar methods of contemporary metallurgy and special processing methods often cannot provide a further improvement of the technical properties of materials, and the solution of this problem requires fundamentally new technological approaches.

Accordingly high performance properties can be achieved by using two or more dissimilar components, combined in a single material. Such materials have come to be called composites [1, 2]. Our experience indicates that plasma technology in combination with blasting, hot extrusion at high pressures and using three-dimensional heat sources (see the diagram) by rolling, impregnation, sintering, etc., offers the greatest promises in the field of development of composition materials.

With the aid of plasma it is possible to grow monocrystalline whiskers, produce powders, fibers, apply protective and barrier coatings on them, etc. Plasma technology makes it possible to produce not only raw products, but also semifinished products that are required for the manufacture of composition materials. For this purpose the matrix material is applied by plasma spraying onto the raw fiber and the semi-finished product is made in the form of blank rolls (figure 1a) or finished products (figure 1b,c). Continuous or cut fiber in linear or mesh packing may be dusted, depending on the nature of the raw material.

USSR UDC 539.4

KOP'YEV, I. M., GEMINOV, V. N., KUDINOV, V. V., GALKIN, YU. A., OVCHINSKIY, A. S., Moscow

"Testing of Composite Materials in Circular Specimens"

Kiev, Problemy Prochnosti, No 8, Aug 73, pp 120-122

Abstract: The possibility is demonstrated of using circular specimens for tensile testing of composite materials reinforced with wire (the matrix was pure aluminum and the armature was wire made from EP-322 steel). The peculiarities of the stress and strain states of the specimens are studied. Results of testing of circular and flat specimens are compared. Three figures, four bibliographs references.

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USSR

UDC 669.71:539.4

RYKALIN, N. N., SHORSHOROV, M. KH., KUDINOV, V. V., and GALKIN, YU. A., Moscow

"Some Means of Producing Reinforced-Fiber Composite"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 4, Jul-Aug 73, pp 98-103

Abstract: The basic theoretical premises and the possibility of producing composites by the method of spraying a matrix onto fibers are discussed from the positions of the physical and chemical processes of joining materials from which the following problems must be solved to accomplish the process: 1) strong joining of fiber and matrix by chemical bonds between them; 2) minimum development of diffusion processes and the absence of new-phase formation between matrix and fibers; 3) maximum preservation of fiber strength; 4) uniform distribution of a given amount of fiber throughout the entire matrix volume; and 5) compaction and strengthening of the matrix with the fibers without damage to the fibers. In this work an aluminum matrix was plasma sprayed onto EP322 steel fibers and it was determined that the bonding strength of the Al-EP322 composite increased with decreased fiber diameter, which in turn reduces the critical length of the 1/2

USSR

RYKALIN, N. N., et al., Fizika i Khimiya Obrabotki Materialov, No 4, Jul-Aug 73, pp 98-103

fiber and makes it possible to obtain the same high level of strength at diminished temperature of fiber preheating in comparison with large-diameter fibers. It was also found that the strength of the plasma-sprayed composite is directly proportional to the volume fraction of fiber in the composite. Two figures, two tables, and ten bibliographic references.

2/2

Graphite

USSR UDC 539.216.2

GALKIN, YU. A., GUSEVA, N. P., DERGUNOVA, V. S., KONOKOTIN, V. V., KRAVETSKIY G. A., KUDINOV, V. V., AND SHORSHOROV, M. KH., Moscow,

"Interaction of Refractory Oxides with Graphite In Spraying"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 3, May-Jun 72, pp 94-99

Abstract: The interaction of refractory oxides with graphite in flame spraying was investigated in order to develop protective means against oxidation of carbographitic materials. The investigated dependences included the effect of base preheating on the bonding strength with the protective coatings and its density, effects of silicate and borosilicate sublayers on the bonding strength and the activation energy of the chemical interaction of sublayers with oxide coatings, the effect of graphite porosity on the bonding strength, and the effect of addition of molybdenum, silicon, and aluminum into the sprayed oxide on the gas density and the oxidative resistance of coatings. The kinetics of the increasing bond strength of Al_2O_3 and ZrO_2 coatings sprayed on preheated graphite are analyzed. The required activation energy of the graphite surface and its strong bond with the sprayed Al_2O_3 was found to be close to the half of the energy of the atomic bond in the graphite lattice, 1/2

USSR

GALKIN, YU. A., et al., Fizika i Khimiya Obrabotki Materialov, No 3, May-Jun 72, pp 94-99

which is in accordance withe graphite preheating over 1000°C when spraying. Silicate and borosilicate sublayers are recommended; they guarantee a bond strength of coatings on the level of graphite strength. Five illustrations, one table, three bibliographic references.

2/2

USSR UDC 631.525+632.594:582.57

GALKINA, G. A., All Union Scientific Research Institute of Medicinal Plants, Moscow

"Use of Herbicides During Cultivation of Dioscorea nipponica Makino"

Leningrad, Rastitel'nyye Resursy, Vol 6, No 2, 1970, pp 267-271

Abstract: The rhizomes of the perennial Dioscorea nipponica Makino are the raw material for the preparation of polysponin - a complex of water-soluble saponins used in the treatment of atherosclerosis of the brain vessels. Herbicides are of special importance in the cultivation of this plant, with its interlacing liana-like stems. Field experiments in Moscow oblast, Novosibirsk and in the Primor'ye Territory have shown that simazin, atrazin and monuron in doses of 4 kg per hectare are very effective in weed control, killing 100% of weeds in the first year, and retaining their effectiveness during the second year (68-79%). These herbicides do not have any negative effect on the viability of Dioscorea or on the content of active substances in the rhizomes. The action of the herbicides in Novosibirsk and the Far East depends on climatic conditions: precipitation aids the efficiency of the herbicides.

UDC 681.3:53.085.3

USSR

SHORNIKOV, YE. A., and GALKINA, G.I.

"Display Device"

USSR Authors' Certificate No 304572, Cl. G 06 f 3/14, filed 25 Apr 69, published 28 Jun 71 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 1, Jan 72, Abstract No 1A395P)

Translation: The proposed display device contains switches for presetting the transducer address, a storage block, a decoder connected to a digital display, control relays. For simplification the divice has one pair of contacts of the control relays connected to the decoder, while the other pair of contacts, connected via a holding circuit, is hooked up to the power source through the contacts of the other relays, whose windings are connected to the switches for presetting the transducer address. 1 illustration.

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USSR

UDC 632.95

NIFANT'YEV, E. YE., GALKINA, L. YE., and RABOVSKAYA, N. S., Moscow University

"A Means of Obtaining Trichlorvinylhexaalkyltriamidophosphonium Chlorides"

USSR Author's Certificate no 309934, filed 4 Mar 70, published 29 Sept 71 (from Referativnyy Zhurnal -- Khimiya, No 10 (II), 1972, Abstract No 10N517P by T. A. Belyayeva)

Translation: Physiologically active compounds of the formula $[Cl_2C{=}CClP(NR_2)_3]^+Cl^-$ (R=alkyl) are obtained by the reaction of neutral amides of phosphorous acid with $Cl_2C{=}CCl_2$ in ether in an atmosphere of inert gas. To a solution of 47 g of freshly distilled PCl_3 in ether (1:5) at -10° and in an atmosphere of inert gas is added a solution of 150 g Et_2NH (distilled over KOH) in ether (1:2). This is kept for 1 hour at $\sim 20^\circ$ and for 1 hour at the boiling point, filtered, evaporated, distilled under vacuum, washed with a 30% solution of NaOH and water, mixed with C_6H_6 (1:1), evaporated, distilled; and 18.4 g $(Et_2N)_3P$ (boiling point 96-98°/6, $n^{25}D$ 1.4710) is obtained. While mixing in a stream of inert gas, 15 g $(Et_2N)_3P$ in 25 ml ether is added to 10.1 g

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USSR

NIFANT'YEV, E. YE., et al., USSR Author's Certificate No 309934, filed 4 Mar 70, published 29 Sept 71

$Cl_2C=CCl_2$ in 25 ml of ether. This mixed for 10 hours at ~20°, the precipitate is separated and washed with dioxane to give I(R=Et); yield: 80%.

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USSR

UDC 547.341.07

NIFANT'YEV, E. YE., GALKINA, L. YE., RABOVSKAYA, N. S., Moscow State University imeni M. V. Lomonosov

"A Method of Synthesizing Trichlorovinylhexaalkyltriamidophosphonium Chlorides"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 23, 1971, Author's Certificate No 309934, Division C, filed 4 March 1970, published 26 Jul 71, p 74

Translation: This Author's Certificate introduces: 1. A method of making trichlorovinylhexaalkyltriamidophosphonium chlorides. As a distinguishing feature of the patent, an absolute amide of phosphorous acid is interacted with tetrachloroethylene in an organic solvent such as ether with subsequent isolation of the goal product by conventional methods. 2. A modification of this method distinguished by the fact that an equimolar ratio of reagents is used. 3. A modification of this method distinguished by the fact that the process is carried out in an inert gas atmosphere. 4. A modification of this method distinguished by the fact that the initial phosphorous acid amide is first purified of chlorohydrates of dialkyl amines.

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USSR

UDC 541.1 + 541.18 + 543.544.6

KOMAROVA, I. V., GALKINA, N. K., RUBINSHTEYN, R. N., and SENYAVIN, M. M., Academy of Sciences USSR, Institute of Geochemistry and Analytical Chemistry Imeni V. I. Vernadskiy, Moscow

"Design of a Ion-Exchange Water Demineralization Process"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 47, No 1, Jan 73, pp 124-129

Abstract: A method is proposed for the design of a process of ion-exchange demineralization of water over incompletely regenerated columns with separate ion exchange resin layers. The initial cycle of water purification over a freshly prepared, fully regenerated ion exchange resin is designed as a dynamics exchange of a substance in the intradiffusional area. The column regeneration and purification of water on the repeatedly studied, incompletely regenerated ion exchange resin was calculated by the layer-by-layer method. The stages are unified by coefficients representing relative decrease in the performance time of incompletely regenerated column in comparison to a fully regenerated one, as a function of the consumption and concentration of the regenerating solution.

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GALKINA, T. B.

JPRS 55687
12 Apr 1972

UDC 582.264.45-113-053

AGE CHARACTERISTICS OF ABSORPTION OF MINERAL SUBSTANCES FROM A NUTRIENT MEDIUM BY CHLORELLA CELLS

[Article by Ye. K. Lebedeva, A. A. Antonyan, T. B. Galkina and G. I. Meleshko; Moscow, Kosmicheskaya Biologiya i Meditsina, Russian, Vol 6, No 1, pp 19-23, 1972, submitted for publication 13 April 1971]

Abstract: Age peculiarities of mineral metabolism of Chlorella SpK cells were investigated during intensive cultivation. The results confirm the fact that the age structure of the Chlorella population and nitrogen and phosphorus removal from the medium are correlated. The correlation also finds support in data concerning the fractionation of nitrogen and phosphorus compounds in cells. This is mainly related to the protein form of nitrogen and the acid-soluble fraction of organic phosphate actively involved in the intracellular metabolism. These findings concerning cell requirements varying with respect to the age structure of the Chlorella population should be taken into account when cultivating an intensive Chlorella culture and determining the quantity of minerals to be added.

The method of prolonged continuous cultivation of Chlorella is based on a systematic replenishment of the loss of mineral elements absorbed by the cells in a nutrient medium and transported mechanically with the growing biomass. Such a study is based on a transfer value experimentally established for a heterogeneous population which varies about its mean value. These mean data are used in preparing a single correcting solution which under stable cultivation conditions ensures the limits of variations in the concentrations of mineral nutrient elements in the medium necessary for normal growth. However, in the course of an experiment one can observe deviations in the cell consumption of mineral elements from the nutrient medium from the established mean values. One of the direct causes of these deviations may be a partial synchronization (a change in the relationship of cells of different physiological age in the population), which is an inevitable result of impairment in cultivation conditions if they exert even an insignificant selective effect on any age stage in the cells.

USSR UDC 669.712.051

LYAPUNOV, A. N., KHODAKOVA, A. G., and GALKINA, Z. G.

"Investigation of the Carbonization of Aluminate Solution With $Al(OH)_3$ Priming"

Moscow, Tsvetnyye Metally, No 2, Feb 71, pp 34-37

Translation: It is shown that the rate of separation of aluminum hydroxide from aluminate solution in the process of carbonization with priming ratio I and higher at any given moment is proportional to the supersaturation of the solution in the first degree. Use of priming protects the walls of the vessel from aluminum hydroxide deposits, and also increase grain size. The absorption of the gas carbon dioxide by the solution increases with an increase in the priming ratio.

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USSR UDC: 621.3.049.73

FEYGINOV, N. I., GALKOV, V. S.

"A Method of Making Hybrid Integrated Circuits"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 31, 1970, Soviet Patent No 283340, Class 21, filed 13 Jun 69, p 54

Abstract: This Author's Certificate introduces a method of making hybrid integrated circuits based on producing passive elements on a dielectric plate, connecting active elements to the current-conducting tracks of the circuit, and dividing the plate into functional modules. As a distinguishing feature of the patent, provision is made for orienting the active elements with respect to the points of attachment, and the assembly procedure is automated by presoldering the active elements to groups of leads on a metal plate from which the active elements are then cut out one by one together with the leads and attached to the current-conducting tracks of the circuit while simultaneously shifting the plates with the active and passive elements through a distance equal to the spacing between the elements and the lead attachment points.

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USSR

UDC 621.791.001.5

KONOVALOV, Ye. G. (Doctor of Techn. Sciences), and GALKOV, V. S. (Engineer)

"Recording the Acoustic Emission as a Method of Studying Welding Processes in the Solid State"

Moscow, Svarochnoye proizvodstvo, No 6, June 72, p 51-52

Abstract: Information for in-depth studies on the kinetics of weld joint formation in the solid state can be provided by the acoustic emission of generated with elastic waves of solids during plastic deformation, failures, and phase transformations. Acoustic vibrations that follow the generation and migration of defects and atomic position interchange may be used as a valuable source of information on the effect of various factors on joint formation as well as concerning the nature of phenomena attending the welding process. The study on the formation of weld joints included welding with an indirectly heated tool, indirect contact-resistance microwelding with a split electrode, and ultrasonic microwelding using longitudinal (44 kc), flexural (66 kc), and transverse (60 kc) vibrations. The test materials were gold and aluminum wires, 40 μ in diameter with silicon coated with an aluminum film (1 μ) and nickel. The results of the study show that microwelding while ensuring a higher weld quality also features acoustic emission spectra with higher values for high-frequency components. (3 illustrations, 5 bibliographic references)

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UDC 8174

USSR

GALUSHKIN, A. I.

"Selecting the Criteria of Primary Optimization and Constructing the Optimal Model of Recognition Systems of K Classes of Patterns in the Training Mode"

V sb. Avtomat. upr. i vychisl. tekhn. (Automatic Control and Computer Engineering — collection of works), Vyp. 10, Moscow, Mashinostroyeniye Press, 1972, pp 104-115 (from RZh-Kibernetika, No 9, Sep 72, Abstract No 9V662)

Translation: A study was made of the construction of optimal models of pattern recognition systems for various optimization criteria. Expressions are presented for the optimal separating surfaces and the optimal values of the mean risk function. Methods of implementing the output unit of the recognition systems of K classes of patterns in a network of linear threshold elements are described.

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UDC 621.791.89:534.1

USSR

KONOVALOV, YE. G., ROSSOSHINSKIY, A.A., GALKOV, V.S.

"Influence of Frequency Spectrum on Formation of Joints in Ultrasonic Welding"

Izv. AN BSSR, Ser. Fiz-tekhn. Nauk, No 2, Minsk, 1971, pp 93-96

Abstract: Studies were performed involving ultrasonic welding of aluminum foil to various materials, using both the frequencies ordinarily used for this purpose and much higher frequencies, up to 212 kHz. It was found that better joints were produced with the higher frequencies. Existing theories cannot explain this dependence of joint quality on frequency. The authors suggest that perhaps the best joints are produced at those frequencies at which the material being welded absorbs the maximum ultrasonic energy, but propose that broad-scale investigations be performed to determine the best welding frequencies for each type of material being welded.

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G

UDC 621.791.89

USSR

KONOVALOV, YE. G., and GALKOV, V. S.

"Ultrasonic Microwelding at a Frequency of 245 KHz"

Kiev, Avtomaticheskaya Svarka, No 6, Jun 70, pp 70-71

Abstract: In a previous paper published by Konovalov, attempts to obtain a weld using only normal oscillations at a frequency of 60 KHz with the converter held vertically and without additional heating of the specimen, ended in failure. The purpose of the present article is to explain this phenomenon. The authors also discuss a high-frequency ultrasonic welding device developed by the Minsk Radio Engineering Institute. A diagram of the converter used in this device is given. The converter contains a knife-shaped steel concentrator with a plate made of TsTS-19 piezoceramic. It is concluded that it is possible to obtain welds with high-frequency normal oscillations, and that the method described in this article provides high-quality welds.

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1/2 021 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--SYNTHESIS AND STRUCTURE OF SOME DIAZONIUM SALTS OF THE 1,2,4,TRIAZOLE SERIES -U-

AUTHOR-(05)-FROLOV, A.N., PEVZNER, M.S., SHOKHOR, I.N., GALKOVSKAYA, A.G., BAGAL, L.I.

COUNTRY OF INFO--USSR

SOURCE--KHIM. GETEROTSIKL. SOEDIN. 1970, (5), 705-9

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ORGANIC SYNTHESIS, MOLECULAR STRUCTURE, DIAZONIUM SALT, ORGANIC AZOLE COMPOUND, PERCHLORATE, NITRATE, CARBOXYL RADICAL, ELECTRONEGATIVITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/1028 STEP NO--UR/0409/70/000/005/0705/0709

CIRC ACCESSION NO--AP0134740

UNCLASSIFIED

2/2 021 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0134740

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ME 3,DIAZO,1,2,4,TRIAZOLE,5,CARBOXYLATE, 3,DIAZONIUM,5,PHENYL,1,2,4,TRIAZOLE FLUOBORATE, PERCHLORATE, AND NITRATE, 3,DIAZONIUM,5,(P,NITROPHENYL),1,2,4,TRIAZOLE, AND THE N,NITRO ANALOG WERE PREPD. THE H ON THE N ATOM IN 3,DIAZONIUM,5,CARBOXY,1,2,4,TRIAZOLE WAS MORE ACIDIC THAN THE ONE IN THE CARBOXYL GROUP. THE STRUCTURE OF A CRYST. DIAZONIUM SALT OF THE TRIAZOLE SERIES DEPENDED ON THE ELECTRONEGATIVITY OF THE SUBSTITUENT IN POSITION 5 OF THE RING. FACILITY: LENINGRAD. TEKHNOL. INST. IM. LENSOVETA, LENINGRAD, USSR.

UNCLASSIFIED

G

USSR UDC 616.981.51

GALKOVSKIY, M. D., Krichevskiy Rayon Hospital, Mogilev Oblast

"Anthrax in Man"

Minsk, Zdravookhraneniye Belorussii, No 2, 1970, p 87

Abstract: The case history of a 59-year-old man who contracted anthrax as a result of tending a diseased cow which coughed and ejected saliva onto his arms is excerpted. Carbuncles later developed on these sites. The patient responded to treatment with anti-anthrax serum, anti-anthrax globulin, antibiotics, cardiac stimulants, vitamins, plasma infusions, dehydration agents, and ointments.

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GALKOVSKIY, V. A. radio engineering/diode switching devices

RADIO ENGINEERING/ DIODE SWITCHING DEVICES

JPRS 54764

22 December 1971

NONLINEAR AND MICROWAVE RADIO ENGINEERING SYSTEMS

Selected articles from the Russian-language book edited by L. D. Bakhrakh, corresponding member of the USSR Academy of Sciences and V. I. Samoylenko, candidate of engineering sciences: Nelineynyye i Sverkhvysokochastotnyye Radiotekhnicheskiye Sistemy, Trudy Moskovskogo Ordena Lenina Aviatsionnogo Instituta imeni Sergo Ordzhonikidze, Vol [illegible], No [illegible], 1970, signed to press 14 October 197[illegible], Machine Building Press, Moscow.

CONTENTS

[I - USSR - F]

GALKOVSKIY, V.A.

UDC 629.7.051:621.396.6[...]

A STUDY OF SOME CHARACTERISTICS OF DIODE SWITCHING DEVICES IN THE DECIMETER RANGE

Engineers G. A. Bukhonina, G. F. Vasil'yev,
V. A. Galkovskiy, I. Ye. Gol'berg, and
Candidate of Engineering Sciences V. N. Ginzburg

pp. 264-31[...]

In this collection [reference 9] the results of an investigation of discrete switching devices in the decimeter range controlled by semiconductor p—n-junctions have been explained. The basic electric parameters of the models of changeover switches (losses and phase-frequency characteristics) turned out to be in good agreement with the calculated data.

This work is devoted to an investigation of certain parameters of diode switching devices that are important in practice. An analysis has been performed of the limitations which are imposed on the quick operation of such devices by the reaction of the high-frequency circuits. Some limitations in the band width of diode switching devices (commutators) in the decimeter range associated with this fact have been analyzed. The features of the operation of these devices at the power levels of the microwave signal close to limiting value for the considered diodes have been considered.

Quick Operation

The quick operation of diode switching devices may be limited by three factors:

(a) the speed of operation of the electronic mechanism of the control semiconductor element;

(b) the processes in the element control circuits;

(c) the processes in the high-frequency circuits of the commutator.

A number of works [references 2, 3, 4] have been devoted to investigation of the quick operation of the electronic mechanism of semiconductors. As a result, we may consider it established that the natural time of point-contact and diffusion germanium diodes is considerably less than 10^{-9} seconds. According to some data [reference 4] it is no worse than 0.1 nanosecond. In other words, in the decimeter wavelength the operation of such diodes as the 1A501 may be considered as practically inertia-free.

CONCLUSIONS

An analysis of the circuits of diode switching devices demonstrated that a number of their properties, such as quick operation, bandwidth, noise, and limiting magnitude of controlled power, depend upon the selection of an additional reactivity entering into the circuit of the diode on-off switch. If the reactivity is selected, these parameters turn out to be unambiguously defined. At the same time, because of other characteristics of these switching devices, these parameters may be changed within known limits. For example, it has been theoretically and experimentally demonstrated that we may achieve a quick action of diode switching devices in the decimeter band assembled from germanium diodes of type 1A5N1 of the order of three high-frequency periods. The magnitude of the limiting controlled power may also be varied precisely thus within definite limits and, in particular, may exceed those values which are guaranteed for the diodes by the supplier. For a widening of the working frequency band additional circuit solutions are required, such as, for example, hooking up detuned diode on-off switches in cascade with these switches spaced along the line at a distance of a quarter wave length from each other.

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BUKHONINA, G. A., VASIL'YEV, G. F., GALKOVSKIY, V. A., GOL'BERG, I. YE. GINZBURG, V. N.

"Study of Some Characteristics of Decimeter-Range Diode Commutation Devices"

Tr. Mosk. aviats. in-ta (Works of Moscow Aviation Institute), 1970, vyp. 215, pp 284-310 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4D328)

Translation: A study is made of the effect of the high-frequency circuits of decimeter-range diode breakers on their speed, bandwidth, noise and behavior at microwave levels close to limiting for control p-n diodes. It is demonstrated that the speed of all the commutation devices with p-n diodes in the decimeter range is on the order of units of nanoseconds with the exception of the maximum decoupling setup time in the blocked arm of the switch which is on the order of hundreds of nanoseconds. One method of expanding the operating band of the switches is presented. The bibliography has 8 entries.

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Soviet Inventions Illustrated, Section II Electrical, Derwent,

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243251 ION SOURCE WITH SURFACE IONIZATION, required in mass-spectrometric analysis, is proposed. Existing designs with divided functions of evaporation and ionization have a low utility factor of the sample, owing to a small ionization factor and losses in sputtering of the sample atoms on the ionizer surface. The proposed ionizer (see diagram) 1 is a thin-walled tube of rhenium, tungsten or tantalum, closed at one end and heated by a DC current along it; the current direction is such that the field assists the ions towards the open end. The evaporator 2 is a hollow cylinder connected by tube 3 to a point near the base of 1.

AUTHORS: Gall', R. N.; Gall', L. N.; Lednev, V. A.

Spetsial'noye Konstruktorskoye Byuro Analiticheskogo Priborostroyeniya AN SSSR

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On heating 2, with the substance for analysis, the vapour passes via 3 to the inner wall of 1, where a part of the atoms is ionized and drawn out by the field towards the ion beam shaper 4. Atoms not ionized by the first collision suffer repeated collisions, increasing the probability of their egress. The initial sputtering factor of the atoms is near 100%; losses are only those due to thermodynamic escapefrom the tube. The combined result of these advantages is a greater utility factor of the sample.

19.3.65 as 947878/26-25.R.N.GALL et al.SPECIAL ANALYTICAL INSTRUMENT DES.BUR.ACAD.SCIENCES USSR. (16.9.69) Bul 16/5.5.69. Class 42l. Int.Cl.G 01n.

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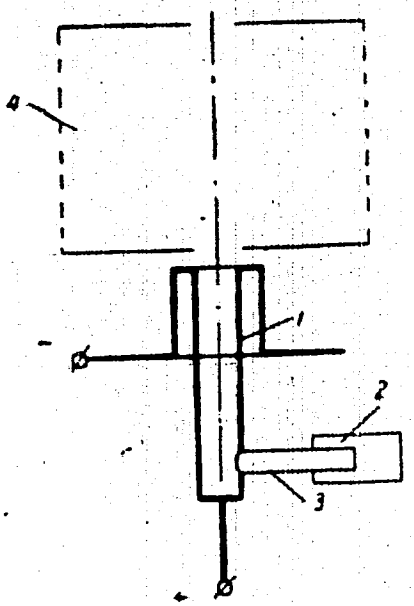

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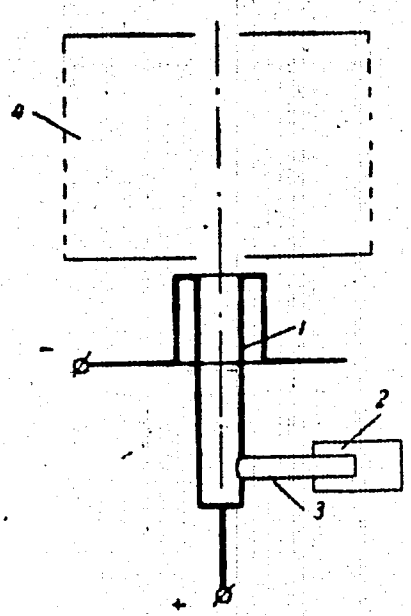

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TITLE-- WINGS FOR THE IMPOSSIBLE DREAM

NEWSPAPER-- KOMSOMOL,SKAYA PRAVDA, JANUARY 15, 1970, P 2, COLS 3-6

ABSTRACT-- THE AUTHORS ARE PROPOSING THE ESTABLISHMENT OF AN INTER-AGENCY COMMISSION ON GLIDERS AND SMALL-ENGINE PLANES WHICH WOULD GUIDE AND COORDINATE ALL THE ACTIVITIES CONNECTED WITH DO-IT-YOURSELF AIRCRAFT.

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