USSR

BOGOMOLOVA, A. S., et al., Svarochnoye Proizvodstvo, No 9, 1973, pp 3-6

the relative thickness required for the copper sublayer was approximately 0.5 while this value for the magnesium-aluminum was not computed. 4 figures, 1 table, 12 bibliographic references.

2/2

- 70 -

USSR   UDC 621.317:621.317.727

POPOV, A. S., YESIKOV, YU. S., ZAKHARKIN, B. V.

"Wide-Band Phase Converter"

Translation: A study was made of the problem of using RC-circuits in a phase conversion circuit from the point of view of obtaining a constant output voltage in a wide-frequency band. Application of emitter followers with low input impedance and a negative feedback circuit (an amplifier with a dynamic load, k = 1,000) permit variation of the phase of the supplied voltage from units of degrees to 150-160° in a wide-frequency band and operation on a low-impedance load. In conclusion, a practical phase converter scheme and its technical specifications are presented.

1/1

USSR

UDC 621.396.69.002

POPOV, A. S., YEPISKOPOSYAN, V. K.

"Estimating the Quality of Technical Documents for Products of the Radio Industry"

Translation: The problems of the quality of technical documentation, including the scientific basis for selecting the schematic and structural design, the technological nature of the design, the convenience of arrangement of the elements, units and assemblies, and so on are discussed. A basis is established for introducing the so-called novelty coefficient of the product into the quality index. A study was made of a procedure for considering the errors of the developer with respect to items provided for by the normative-technical documents. An error classification is presented. There are 2 tables and a 5-entry bibliography.

1/1

AA 0043450

UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

244426 OSCILLATING CIRCUIT consists of a variable capacitor designed in such a way that the fixed plates (2) also perform as inductive coils and the moving plates (7) have an additional function of being magnetic cores of the inductors. Both types of plates have been shaped as Archimedean spirals. The oscillations are generated by producing one potential on leads (5 & 10) and a different one on the lead (6). Bellows (9) are used for varying the relative inductance and capacitance. The component is encased in a glass hermetically sealed envelope (11).
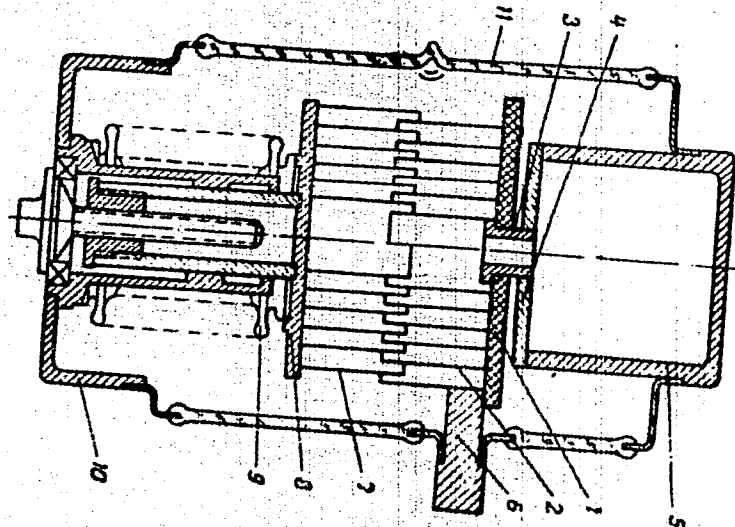3.7.67 as 1171030/26-9. A.S. POPOV, I.A. DEREV'YANKO (9.10.69) Bul 18/28.5.69. Class 21a4. Int.Cl. H 03h.

19761802

AA0043450

2/2

19761803

USSR

UDC 616.12-008.1-072.7:616.151.1-07

KOROL'KOV, V. I.

"The Effect of Hypo- and Hypervolemia on Orthostatic Stability"

Abstract: An orthostatic test of 15 minutes' duration (on a special
rotating table) markedly lowered arterial pressure in hypovolemic
dogs (who had lost a volume of blood equal to 0.8% of the body
weight) and altered other hematological indices (acid-base balance,
gaseous composition, EKG). Replacement of the lost blood with an
equivalent amount of polyglucine (a product of partial hydrolysis
of dextran with hydrochloric acid) improved the animals' tolerance
for the orthostatic test. Hypervolemia induced by intravenous in-
fusion of 20 mg/kg of polyglucine had no significant effect on
arterial pressure, cardiac rate, or other hematological indices
and did not increase orthostatic tolerance.

1/1

ASKEROV, CH. I., IBRAGIMOV, T. A., POPOV, A. S.

"Minimizing the Flow Charts of Algorithms Considering the Shift Distribution of
the Operators"

Translation: A study is made of a method of minimizing the flow charts of algo-
rithms considering the shift distribution of the operators. The flow chart re-
presents a branched algorithmic process and contains the initial and final apex
and the operator and logical apexes. By the preceding operator apexes we mean
those from which there are paths in the flow chart not containing the operators
leading to the given apex. By the shift distribution of the operators we mean
the defined dependence of the logical apexes on the operator apexes. The corre-
sponding minimization algorithm is presented which consists in the following.
First, the apexes isolated from the beginning of the flow chart are eliminated.
Then for each logical apex the operator apexes preceding it on the flow chart
are found: if there are no such logical apexes on the paths from them, they are
recorded in a list; if they exist,then depending on the situation the counter and
the specially introduced characteristic of trafficability of the paths of the

1/2

USSR

ASKEROV, CH. I., et al., Teor. kibernetika, Kiev, 1971, pp 17-23

logical apex assume the corresponding values; if the counter is equal to 2 (over-flow), then the following logical apex is investigated; otherwise for each opera-tor apex the list is checked to see whether the given logical apex belongs to the shift distribution. After investigating the entire flow chart, the entire process is repeated until the flow chart remains unchanged. It is noted that a similar problem of minimization can be stated for the algorithm flow chart. The program developed for the M-20 computer can operate in this case faster since the algorithm flow chart can be more tightly packed in the computer memory.

2/2

UDC   621.372.413.001.5

USSR

POPOV, A. V., POPOVA, M. N.

"Diffraction Losses of a Dielectric Open Resonator"

Moscow, Radiotekhnika i Elektronika, vol 16, No 12, Dec 71, pp 2175-2181

Abstract: The parabolic equation method is used to study electromagnetic oscillations in a dielectric prism with mirrors on the ends assuming that the wavelength is short compared with the dimensions of the prism and the index of refraction is equal to or greater than unity. The problem is formulated as follows. Let an infinite prism $|x| < l$, $|y| < a$ be filled with a dielectric with permittivity ε and permeability μ such that $n = \sqrt{\varepsilon\mu} \geqslant 1$. The ends $|x| = l$ are closed by ideally conducting mirrors, and the faces $|y| = a$ are in direct contact with a vacuum. The authors find the two-dimensional (independent of the z-coordinate) electromagnetic oscillations with frequency $\omega = kc$ in the dielectric and surrounding space. The authors thank S. A. Khozioskiy and N. G. Vakhitov for constructive criticism. Two figures, bibliography of six titles.

1/1

UDC 539.1.01

USSR

V. A. ZHDANOV, A. V. ZHUKOV, And A. V. POPOV (Scientific Research Institute of Applied Mathematics and Mechanics, Tomsk University)

"The Effect of the First Quantum Correction on the Characteristics of Metallic Sodium (Brief Communication)"

Tomsk, Izvestiya VUZ Fizika (News of the Higher Educational Institutions, Physics), No. 9(112), 1971, pp 126-128

Abstract: The principal characteristics of metallic sodium are determined on an M-20 digital computer, using the nonparametric function of the binding energy and taking the first quantum correction into account. The results of the calculations are compared with experimental data and the Thomas-Fermi-Dirac (TFD) model. Agreement with the experimental data is almost exact for the finding energy, the lattice constant is about 10% below the experimental value, and the modulus of elasticity is about 20% above. Agreement with the TFD model is not as good but improves when the correction is applied.

Further improvement of the statistical approximation can be obtained by higher-order quantum corrections or by refining the model of the metal.

Orig. art. has 1 table and 5 refs.

1/1

UNCLASSIFIED

PROCESSING DATE--16OCT70

1/2   036
TITLE--TECHNOLOGICAL POTENTIALITIES AND PLASTICITY OF METALS IN HIGH SPEED
PRESSING -U-
AUTHOR-(04)-SOGRISHIN, YU.P., KOBYAKOVSKIY, N.F., POPOV, A.V., MOROZ,
V.YA.
COUNTRY OF INFO--USSR
SOURCE--MOSCOW, VYSOKOSKOROSTN. OB"YEMN. SHTAMPOVKA (ENIKMASH), SBORNIK
REFERENCE--REFERATIVNYY ZHURNAL, TEKHNOLOGIYA MASHINOSTROYENIYA, NO 2,   OF
DATE PUBLISHED--------69

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--PLASTICITY, METAL FORGING, METAL PRESSING, PLASTIC
DEFORMATION, BIBLIOGRAPHY, IMPACT LOAD, ALLOY DESIGNATION, TITANIUM
ALLOY/(U)ST45 MEDIUM CARBON STEEL, (U)30KHGSA LOW ALLOY STEEL,
(U)IKHI8N9 STAINLESS STEEL, (U)V96 ALUMINUM ALLOY, (U)AK6 ALUMINUM
ALLOY, (U)VT31 TITANIUM ALLOY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/0088   STEP NO--UR/0000/69/000/021/0009/0026

CIRC ACCESSION NO--AR0117363
                    UNCLASSIFIED

USSR

PROCESSING DATE--16OCT70

UNCLASSIFIED

CIRC ACCESSION NO--AR0117363
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ADVANTAGES AND TECHNOLOGICAL POTENTIALITIES OF HIGH SPEED PRESSING ARE DESCRIBED. A CLASSIFICATION OF FORGINGS SUITABLE FOR FABRICATION ON HIGH SPEED HAMMERS AND ALSO RATIONAL SCHEMES OF FORGING FORMING ARE PRESENTED. DATA ON PLASTICITY AND RESISTANCE TO PLASTIC DEFORMING IN SHRINKAGE AND PRESSING OF THE STEELS 45, 30KHGSA, 1KH18N95, AND TI (VTZ-1) AND A1 (AK6 AND V96) BASED ALLOYS ARE GIVEN. A METHOD FOR DETERMINING REQUIRED IMPACT ENERGY IN FABRICATING FORGINGS IS SET FORTH.

UNCLASSIFIED

Molecular Physics

UDC 53.07/.08+53.001.5

USSR

POPOV, A. V., USHAKOV, V. A., CHISTYAKOV, YU. D., IVANOVSKIY, G. F.

"The Effect of Carbon Dioxide on the Growth Mechanism of Autoepitaxial Layers of Silicon Under Vacuum Deposition"

Sb. nauchn. tr. po probl. mikroelektron. Mosk. in-t elektron. tekhn. (Collection of Scientific Works on Problems of Microelectronics. Moscow Institute of Electronic Engineering), 1969, No 4, PP 109-112 (from RZh-Fizika, No 1, Jan 71, Abstract No 1A825)

Translation: The effect of CO_2, which is one of the basic components making up residual gases in a vacuum chamber, on surface morphology and the structure of autoepitaxial layers of Si during condensation from a molecular beam in a vacuum is explained. The admission of CO_2 up to a pressure of 10^{-4} – 10^{-6} mm Hg (the vacuum was 10^{-8} mm Hg before admission) in the process of deposition of auto-epitaxial layers at a substrate temperature $t_n = 950°C$ onto the surface of a substrate preliminarily treated in a vacuum of 10^{-7} – $2 \cdot 10^{-8}$ mm Hg at $t_n = 125°C$ for 10 min led to the formation of layers with a smooth surface and not containing

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POPOV, A. V., et al, Sb. nauchn. tr. po probl. midroelektron. Mosk. in-t elektron. tekhn., 1969, No 4, pp 109-112

packing defects. If the thermal treatment of the substrate at t_n = 1100-1150°C for 8 min at a pressure of $3 \cdot 10^{-8}$ mm Hg concluded with retention at t_n = 1250-1350°C (1-3 min) with simultaneous admission of CO_2 (P_{CO_2} = 10^{-5} mm Hg) and

subsequent deposition of autoepitaxial layers was carried out at t_n = 950-1000°C with or without admission of CO_2, the surface of the Si was strongly distinguished by a developed relief and ripple and these were greater the longer the admission of CO_2 was continued. The density of the packing defects of these layers fluctuated from 10^2 cm^{-2} to 10^5 cm^{-2}. The highest quality layers upon admission of CO_2 during annealing were obtained under the following mode : annealing of the substrate at 1250-1300° (10 min), admission of CO_2 up to 10^{-5} mm Hg (1-3 min), deposition of the autoepitaxial layer at t_n = 950-1100°C at $2.5 \cdot 10^{-8}$ mm Hg. This is probably explained by the formation of a continuous hydrogenous film of the liquid phase which assists the flow of the process in the order vapor-liquid-autoepitaxial layer. A. Darevskiy.

2/2

USSR

POPOV, A. V., and KLIMOV, I. A., Editorial Board of the Journal Radiobiol-
ogiya (Radiobiology) of the Academy of Sciences USSR

"Proteolytic Activity of the Blood Serum of Dogs Exposed to Gamma-Neutron
Radiation in Lethal and Sublethal Doses"

Proteoliticheskaya aktivnost' syvorotki krovi sobak pri vozdeystvii gamma-
neytronnogo izlucheniya v letal'nykh i subletal'nykh dozakh (cf. English
above), Moscow, 1970, 7 pp, bibliography with 15 titles (No 2018-70 Dep)
(from RZh-Biologicheskaya Khimiya, No 2, 25 Jan 71, Abstract No 2F1329 Dep
by authors)

Translation: In dogs which had undergone acute gamma-neutron irradiation in
sublethal and lethal doses the proteolytic activity of the blood serum
increased during the climax of radiation sickness. This increase varies with
radiation dose, irradiation conditions (unilateral or bilateral) and body
weight of the animals. Survival of the dogs is probable unless proteolytic
activity is three or four times initial activity, but death of the animals
is certain, as a rule, if the increase in activity is more significant.

1/1

PROCESSING DATE--20NOV70

UNCLASSIFIED

1/2   011
TITLE--REINFORCED HOSE PRODUCTION -U-

AUTHOR-(05)-ZHELTYSHEV, YU.G., VINOGRADOV, N.N., MESHENNIKOV, V.N., POPOV, A.V., PROKOFYEV, B.F.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 219160
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI NR 18
DATE PUBLISHED--17OCT69

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--REINFORCED MATERIAL, RUBBER WORKING MACHINERY, WIRE, PATENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/0043   STEP NO--UR/0482/69/000/000/0000/0000

CIRC ACCESSION NO--AA0127685
                                 UNCLASSIFIED

PROCESSING DATE--20NOV70

UNCLASSIFIED

CIRC ACCESSICN NO--AA0127685
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MICROFICHE OF ABSTRACT CONTAINS
GRAPHIC INFORMATION. EXISTING METHODS, HAVE NO PROVISIONS FOR BRINGING
THE INNER TUBE INTO FIRM CONTACT WITH HELICES OF THE REINFORCING WIRE,
AND FOR THE EVACUATION OF AIR DURING THE EXTRUSION OF THE INTERMEDIATE
AND OUTER LAYERS OF RUBBER WILL TEND TO PRODUCE REINFORCED HOSES OF
UNSATISFACTORY QUALITY. WITH THE PROPOSED METHOD OF TWO DIAMETER HOLLOW
MANDREL AND VACUUM CHAMBERS ARE USED: THE INNER TUBE BEING EXTRUDED
ONTO THE SMALLER DIAMETER AND BROUGHT INTO FIRM CONTACT WITH THE HELICES
OF THE REINFORCING WIRE UNDER THE ACTION OF COMPRESSED AIR INTRODUCED
INTO THE HOLLOW MANDREL. THEN THE INNER TUBE IS TRANSFERRED ONTO THE
LARGER DIAMETER PART OF THE MANDREL AND MOVED THROUGH THE VACUUM
CHAMBERS SO THAT THE AIR IS REMOVED DURING THE EXTRUSION OF THE
INTERMEDIATE AND OUTER LAYERS. ON COMPLETION OF BUILDING OPERATIONS THE
HOSE IS TRANSFERRED TO A VULCANIZER OF THE CONTINUOUS TYPE. THE
CONTINUOUS PRODUCTION LINE COMPRISES OF THE FOLLOWING ITEMS INSTALLED IN
A STRAIGHT LINE: AN EXTRUDER FOR EXTRUSION OF THE INNER TUBE, A WINDER
FOR APPLICATION OF THE WIRE REINFORCEMENT, AN EXTRUDER FOR THE
APPLICATION OF THE INTERMEDIATE LAYER, A BRAIDING MACHINE, AN EXTRUDER
FOR FORMING THE OUTER RUBBER COVER, AND A TAKE OFF MACHINE.

UNCLASSIFIED

SCI. ABST. SER. B

№0050727

/ 11753   The magnetic system of large spectrometers of charged particles.
Yu.G.Basargin. N.I.Doinikov, A.V.Popov, B.V.Rozhdestvenskii. G.N.Samso-
nov. A.S.Simakov.
Zh. Tekh. Fiz. (USSR), vol.39. no.8. p.1472-7 (Aug. 1969). In Russian.
A magnetic analyser with inhomogeneous field is described. The angle of rota-
tion is 270° at a radius of 2m. The conditions for double and triple focusing are
given. and the method of obtaining these is described. Aberrations are corrected
by means of regulating non-linear lenses. Computed field distributions in the
basic and correcting magnets are given. The construction of the basic magnetic
system is discussed. (13 refs.) K.G.M.

19810725

AP9036076

NUCLEAR SCI. ABST. 8/69   0000

29269   DIFFERENTIAL CONVERTER FOR NUCLEAR LEVEL
LIFETIME MEASUREMENTS. Berlovitch, E. E.; Kotchkin, V. A.;
Lukashevitch, V. V.; Popov, A. V.; Romanov, V. M. (Ioffe Inst.
of Physics and Tech., Leningrad). Nucl. Instrum. Methods, 71:
99-101(1969).

A differential converter comprising two conventional converters,
a differential amplifier, a generator, and a summing device is de-
scribed. In lifetime measurements by the center of gravity shifting
method the differential converter compensates for the instrument al
effects which do not result in shifts of the centers of gravity of
shaper pulses. Another distinguishing feature of the converter is
stability of the time-amplitude conversion. Root-mean-square
spread of the centers of gravity for coincidence curves with a
^{60}Co source is not over 3×10^{-13} sec for 12 h. (auth)

1941   0076

APO 017021

SCI. ABST. SER. A   NE 0000

P

42148   A differential converter for nuclear level lifetime measurements.
E.Ye.Berlovitch, V.A.Kotchkin, V.V.Lukashevitch, A.V.Popov, V.M.Romanov
(A.F.Ioffe Physical-Technical Inst. U.S.S.R. Academy of Sci., Leningrad, U.S.S.R.).
Nuclear Instrum. Methods (Netherlands), vol.71 no.1, p.99-101 (15 May 1969).
A differential converter comprising two conventional converters, a differential amplifier, a generator and a summing device is described. In lifetime measurements by the centre of gravity shifting method the differential converter compensates for the instrumental effects which do not result in shifts of the centres of gravity of shaper pulses. Another distinguishing feature of the converter is stability of the time-amplitude conversion. Root-mean-square spread of the centres of gravity for coincidence curves with a ^{60}Co source is not over 3×10 ^{12}sec for 12h.

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AA0040776   P   Popov, A.V.

                                                UR 0482   /-70

Soviet Inventions Illustrated, Section I Chemical, Derwent,

241657   EXTRUDED RUBBER BLANKS can be continuously
              vulcanised under pressure by using the
illustrated equipment, which consists of the ex-
trusion press (1) with head (2) rigidly connected
to the intermediate chamber (3) provided with a
bayonet valve (4), with the vulcanising tank (7)
fitted with the horizontal induction heating coil
(5) in its cover. Guiding rollers (8) and release
device (9) carry the extruded rubber through the
tank to the winding drum (11). The reservoir (13)
holds the liquid heat carrier which flows into the
vulcanising tank by gravity through the valve (14)
the liquid being drawn off through the pipe (15),
valve (16), into the receiving tank (17). The
sealing of the outlet from the tank is done with
the help of the magnetic arrangement (19), with the
windings (20), which create the magnetic flux,
being mounted concentrically with the duct (21),
filled with the ferromagnetic mixt. (22), packed
round the rubber as it emerges from the bath.

                    19750479

1A0040776

Easily-fusible alloys of metals with high densities
are used as the heat carrier. The amount of
pressure exerted by the ferromagnetic material on
the emerging rubber is controlled by the number
of ampere-turns in the voltage supply
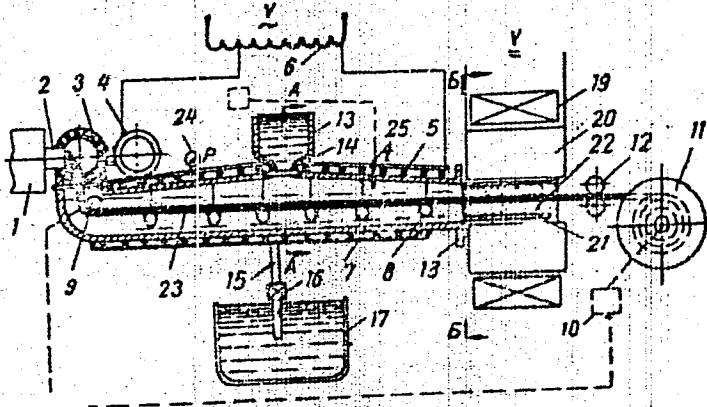
17.7.67. as 1172795/23-5, VASIL'EV, V.A. and
POPOV, A.V. (28.8.69) Bul. 14/18.4.69. Class
39a Int. Cl. B 29h.

19750480

UDC: 518.5:681.3.06

USSR

POPOV, B. A.

"A Method of Generating Uniformly Distributed Pseudorandom Numbers on a Digital Computer"

Otbor i peredach inform. Resp. mezhved. sb. (Selection and Transmission of Information. Republic Interdepartmental Collection), 1971, vyp. 27, pp 30-33 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V963)

Translation: It is proved that for any continuous random quantity X there is a number r such that the probability density function of the random quantity $Y = \{rX\}$ differs arbitrary little from normal distribution on the interval $[0,1]$. Probabilistic estimates are found for the difference of the distribution of random numbers $Y = \{r,X\}$ from normal. The results are used as a basis for a new method of modeling uniformly distributed pseudo-random numbers on a digital computer. The proposed method is especially convenient for modeling such numbers on low-performance digital computers. Author's abstract.

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USSR

UDC 621.391:519.27

POPOV, B. A.

"Transmission of Images Over an Isotropic Light-Optical Channel"

Otbor i peredacha inform. Resp. mezhved. sb. (Sorting and Transmitting Information. Republic Interdepartmental Collection), 1970, vyp. 23, pp 40-49 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8A32)

Translation: This article contains an investigation of certain laws of image transmission over isotropic light-optical channels. It is demonstrated that with an object diameter approaching zero the brightness of its image approaches the brightness of the image of a point source. In the general case expressions are obtained for the image brightness of certain frequently encountered objects. The general relations between the image brightness and the objects are established. Specific procedures for the cases where the spatial frequency characteristic of the channel is gaussian or an exponential curve are investigated. The apparatus of generalized functions and two-dimensional Fourier transformation is used. There are two tables and a 22-entry bibliography.

1/1

USSR

UDC 621.391:519.27

POPOV, B. A.

"Transmission Functions of Isotropic Light-Optical Channels"

Otbor i peredacha inform. Resp. mezhved. sb (Information Sorting and Trans-mission. Republic Interdepartmental Collection), 1970, vyp. 23, pp 23, 31-39 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8A33)

Translation: The methods of two-dimensional Fourier transformation are used to investigate the most widespread transmission functions of isotropic light-optical channels: the optical transmission function, the pulse transmission function, the line transmission function and the edge transmission function. Certain properties of the transmission functions are established. Formulas are obtained which relate the transmission functions to each other. The general equations of optical image transfer based on various transmission functions are presented. The possibility of applying certain mathematical expressions for approximation of various transmission functions is investi-gated. The apparatus of generalized functions is used. There are two tables and a 36-entry bibliography.

1/1

UDC 577.1.615.7/9

USSR

ZALIKIN, G. A. and POPOV, B. A.

"Effect of DTPA in Accelerating the Excretion of Americium-241 After Protracted (to 300 days) Administration of the Isotope to Mammals"

Vliyaniye DTPA na uskoreniye vyvedeniya ameritsiya-241 pri dlitel'nom do 300 dney vvedenii izotopa v organizm mlekopitayushchikh (cf. English above. Editorial board of the journal Radiobiologiya [Radiobiology]), Moscow, 1972, 13 p, bibl. 6 refs (No 4C44-72 Dep (from RZh-Biologicheskaya Khimiya, No 18, 25 Sep 70, Abstract No 18 F1965 Dep)

Translation: Rats were injected subcutaneously with Am^{241} hydrochloride [sic] daily. After 200 days the animals were divided into 3 groups: (i) the animals continued to receive Am^{241} until day 300; (ii) the animals were treated with DTPA for the next 100 days; (iii) the animals received no treatment after day 200. Pentacin significantly increased the rate of excretion of Am^{241}: after 60 days of treatment the amount of isotope in the liver decreased to 18.4% compared with the amount at the start of treatment and by day 300 it came to 4.9%. After 100 days the amount of isotope in the skeleton decreased to 31% of the initial level. DTPA was found to accelerate the excretion of Am^{241} not only with urine but also with feces, altering the effective half-life of the

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USSR

ZALIKIN, G. A. and POPOV, B. A., Vliyaniye DTPA na uskoreniye vyvedeniya ameritsiya-241 pri dlitel'nom do 300 dney vvedenii izotopa v organizm mlekopit- ayushchikh

isotope: about 70% of the excreted Am^{241} was excreted with a rapidly excreting $T_{1/2}$ phase of 4 days [in animals that did not receive DTPA, Am^{241} was excreted with $T_{1/2}$ of 124 days (with urine) and $T_{1/2}$ of 46 days (with feces)].

2/2

Aerosols

UDC 614.841.12

USSR

SMELKOV, G. I., POPOV, B. G., and LAVROV, N. V., Academician of the Uzbek
SSR Academy of Sciences

"Mechanism of Spark Ignition of Aerosols"

Moscow, Doklady Akademii Nauk SSSR, Vol 196, No 4, 1971, pp 876-877

Abstract: The study of the process of ignition of two-phase systems by
spark discharges is complicated by the absence of a clear explanation of
the mechanism of development of the spark discharge channel. This paper
contains a study of the process of ignition of a polystyrene aerosol with
a fractional composition of 0-75 μ by condensed spark discharges. The
study was made on high-speed movie shots taken by the SKS-1M camera.
Sample film strips are presented.

The described method of high-speed photography permitted isolation and
estimation (with respect to duration) of three stages in the process of
spark ignition and flame development in aerosols: reaction in the volume
of the mixture, the frontal flame propagation phase and the turbulent
combustion phase. The results indicate the similarity of the nature of

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development of the flame nucleous with a spark ignition initiator and in
dust-air mixtures just as in homogeneous gas and air media.

2/2

- 1 -

USSR

POPOV, B. G., TROFIMOV, V. V.

"Stability of Rings and Cylindrical Reinforced Shells Under Local Loadings"

4-ya Vses. Konf. po Probl. Ustoychivosti v Stroyit. Mekh. Tezisy Dokl. [Fourth All-Union Conference on Problems of Stability in Structural Me- chanics, Theses of Reports -- Collection of Works], Moscow, 1972, pp 100- 101, (Translated from Referativnyy Zhurnal, Mekhanika, No 10, 1972, Abstract No 10 V314).

Translation: The problem of stability of rings and cylindrical reinforced shells is solved in its linear statement considering heterogeneity of the initial stress-strain state. Loading with concentrated radial forces is studied. An energetic method is used for the solution. The bifurcational bend functions are fixed as trigonometric series. The normal displacements of the second order of magnitude are determined in general form, allowing the operation of a fixed system of external forces to be calculated. The problem is solved of the stability of a ring loaded with four "dead" forces, acting along mutually perpendicular diameters, with opposite forces equal and mutually perpendicular forces interrelated by a proportionality factor. The problem of the stability of a reinforced cylindrical shell is solved using a semi-momentless theory. A freely supported shell is loaded through

1/2

USSR

POPOV, B. G., TROFIMOV, V. V., 4-ya Vses. Konf. po Probl. Ustoychivosti v Stroyit. Mekh. Tezisy Dokl., Moscow, 1972, pp 100-101.

a rib with concentrated radial forces. A solution for a smooth shell is produced as a particular case. The influence of relative rigidity of a rib on the critical force and form change upon loss of stability is estimated. Results are presented from an experimental study of the stability of rings and shells; the experimental results were close to the calculated results.

2/2

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USSR   UDC: 621.317.39: 543.275.3.08

TURUBAROV, V.I., PODOL'SKIY, A.A., KALAKUTSKIY, L.I.,
LOGVINOV, L.M., POPOV, B.I., RUMYANTSEV, V.V. and
VORONOV, A.F.

"High-Sensitivity Device for Continuous Measurement of Dust Concentration in Biosphere"

Translation: The design and operating principle are described of a continuous-action, electronic, induction dustmeter, developed by the Leningrad Aviation Instrument Building Institute jointly with the Kuybyshev Aviation Institute. The dust concentration measurement method is based on the relation between the size of aerosol particles and their charges received in the corona discharge field. This type

1/2

USSR

TURUBAROV, V. I., et al., Sb. Fiz. metody i vopr. metrol. biomed. izmereniy, 1972, pp 288-289

dustmeter measures the surface concentration, therefore the change in dispersion concentration does not cause errors in dust concentration count. The dustmeter can be also calibrated by the weighing method with constant dispersion concentration and variation of weight concentration. Several modifications of electronic dustmeters characterized by sensitivity and range have been developed. The technical characteristics of EIP-3 dustmeter are: sensitivity, 10^{-2} mg/m^3; weight, 5 kg; power consumption, 10 w; dynamic concentration range, -10^3; overall dimensions, 280 x 190 x 80 mm. Test results of electronic induction dustmeters are presented.

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USSR   UDC 616.981.551-612.014.464

BELOKUROV, Yu. N., VODOLAZOV, Yu. A., KAMENNYY, A. N., POPOV, B. V., and
KIRSANOV, B. N.

"Inhalation of Oxygen Under High Pressure for Tetanus"

Kazan', Kazanskiy Meditsinskiy Zhurnal, No 5, 1971, p 93

Abstract: A 46-year-old male received a prophylactic dose of tetanus anti-
toxin as well as tetanus toxoid for gunshot wounds in the neck and back,
but his condition began to deteriorate sharply seven days after the injury
and convulsions occurred with increasing frequency. When repeated injections
of tetanus antitoxin, oxygen, analgesics, antihistamine, and desensitizing
agents were ineffectual and the convulsions intensified, it was decided to
institute hyperbaric oxygen therapy (1-1/2 hour exposure with O_2 pressure
about 3 atm. The symptoms began to subside within 24 hours and respiration
became easier. However, convulsions were provoked by the slightest movement
and another session was carried out 24 hours later. The patient's condition
showed steady improvement and convulsions became less frequent and confined
to increasingly smaller areas. By the 15th day from the time of admission
to the hospital, the clinical symptoms of tetanus disappeared completely.

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USSR

UDC: 621.37/.39(083.72)

BELAKHOV, L. Yu., POPOV-CHERKASOV, I. N. (editors)

"Scientific and Technical Terminology. Collection of Standardized and Recommended Terms. In 10 Volumes. Vol. 6. Part 1. Monitoring and Measuring Instruments and Equipment. -- Electronic Technology. -- Radio Electronics and Communications"

Nauchno-tekhnicheskaya terminologiya. Sb. standartiz. i rekomend. terminov. V 10 tomakh. T. 6. Ch. 1. Kontrol'no-izmeritel'nyye pribory i apparaty. -- Elektronnaya tekhnika. -- Radioelektronika i svyaz' (cf. English above), Moscow, Standarty, 1970, 467 pp, ill. 2 r. 10 k. (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1A9K)

[No abstract]

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USSR

UDC: 621.37/.39(083.72)

BELAKHOV, L. Yu., POPOV-CHERKASOV, I. N. (editors)

"Scientific and Technical Terminology. Collection of Standardized and
Recommended Terms. In 10 Volumes. Vol. 6. Part 2. Monitoring and Measuring
Instruments and Equipment. -- Electronic Technology. -- Radio Electronics
and Communications"

Nauchno-tekhnicheskaya terminologiya. Sb. standartiz. i rekomend. terminov.
V 10 tomakh. T. 6. Ch. 2. Kontrol'no-izmeritel'nye pribory i apparaty. --
Elektronnaya tekhnika. -- Radioelektronika i svyaz' (cf. English above),
Moscow, Standarty, 1970, 248 pp, ill. 1 r. 55 k. (from RZh-Radiotekhnika,
No 1, Jan 71, Abstract No 1A10 K)

Translation: Part 1 see Abst. 1A9.

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USSR

UDC: 621.37/.39(083.72)

BELAKHOV, L. Yu., POPOV-CHERKASOV, I. N. (editors)

"Scientific and Technical Terminology. Collection of Standardized and Recommended Terms. In 10 Volumes. Vol. 6. Part 1. Monitoring and Measuring Instruments and Equipment. -- Electronic Technology. -- Radio Electronics and Communications"

Nauchno-tekhnicheskaya terminologiya. Sb. standartiz. i rekomend. terminov. V 10 tomakh. T. 6. Ch. 1. Kontrol'no-izmeritel'nyye pribory i apparaty. -- Elektronnaya tekhnika. -- Radioelektronika i svyaz' (cf. English above), Moscow, Standarty, 1970, 467 pp, ill. 2 r. 10 k. (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1A9K)

[No abstract]

1/1

USSR   UDC: 621.396.96:681.32

FEDOROV, V. A., POPOV, D. I., REPIN, N. K.

"A Device Based on Potential Logic Elements for Amplitude-Time Quantization With Respect to the Center of Pulses"

Translation: The paper presents the circuit of a device in which the time position of a standard pulse is determined by the center of the input pulse rather than by the edge of the pulse. The operation of the individual elements of the device is considered. Six illustrations, bibliography of two titles. N. S.

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USSR   UDC: 621.396.96:681.32

POPOV, D. I., AVDEYEV, V. V., FEDOROV, V. A., SHESTAKOV, N. D.

"Effectiveness of a Device for Digital Two-Dimensional Filtration of Radar Images"

Translation: The necessity for two-dimensional filtering arises, for instance, when objects are to be recognized on two-dimensional radar images of a locality. When image scanning is present, i. e. as a result of conversion of the two-dimensional image to a one-dimensional image, the problem reduces to recognition of a pattern consisting of individual points; it can be solved by reckoning the number of pulses which fall into the next formation, whose position on the subsequent line is determined by the pulse of the previous line. A device which realizes this method is described. The results of calculation of the characteristics of the device are presented. Bibliography of five titles. N. S.

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USSR   UDC: 546.655+547.466+541.49

ROGOZINA, E. M., POPOV, D. K., and PONIKAROVA, T. M.

"A Study of the Interaction of Radio Isotopes of Rare Earth Elements With
Proteins and Amino Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 40 (102), No 11, Nov 70, pp 2466-2469

Abstract: The stability of histidine complexes with yttrium and cerium indi-
cates that this amino acid takes an active part in the transfer and accumula-
tion of radioactive isotopes in an organism. To confirm this hypothesis, an
experiment was conducted in which a rat was given an intraveinous injection
of an aqueous solution of a histidine complex with yttrium-90, and another rat
was injected with an aqueous solution of yttrium chloride. The amount of Y-90
in the organs of the rat injected with the histidine complex was generally
3-5 times greater than in the animal injected with the chloride solution. The
resultant data confirm the hypothesis on the active participation of amino
acids in the transfer of trace elements by the blood when the element forms
a complex compound with an amino acid which is not broken down by chemical con-
versions in the organism. The ion exchange method with an isotopic tag was

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USSR

ROGOZINA, E. M., et al, Zhurnal Obshchey Khimii, Vol 40 (102), No 11, Nov 70, pp 2466-2469

used for studying enzyme - trace element systems. Pepsin and trypsin were the enzymes studied. It was found that yttrium does not form complexes with these proteins in the acid region. Noticeable binding of yttrium with the enzymes begins at pH 5-6. At a pH of 6-7, both pepsin and trypsin form water-soluble complexes. Maximum yttrium binding is observed at a pH of 7-9. In the case of pepsin, nearly 70% of the yttrium forms complexes with the enzyme.

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Powder Metallurgy

BELOV, A. F., FATKULLIN, O. Kh., POPOV, D. S., STAROSVETSKIY, D. I., Moscow

"Degassing of Nickel-Chromium-Based Alloys Made by Powder Metallurgy Methods"

Abstract: This work studies one problem in the area of improvement of pro-
cesses of powder metallurgy of nickel-chromium-based alloys -- the gas content
of the materials produced from various types of charge (alloyed powders and
mixtures of powders of the individual alloy components), and the influence of
certain technological parameters on the final gas content in the powders.
The temperature dependences were produced for the liberation of gasses in a
vacuum from powder materials composed of individual components and produced
by atomizing, used as the charge for nickel-based alloys. The gas content of
various fractions of powders produced by atomizing of a melt into water has
an extreme. The extremal nature of the gas content of various powder frac-
tions is explained by the influence of changes in the total surface of the
powders and the number of pores in the particles.

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USSR   UDC 621.391.822:621.382

POPOV, E. G.

"Equivalent Noise EMF of an Amplifying Cascade in a Field Transistor with a
p-n Junction"

Materialy nauchno-tekh. konferentsii. Leningr. elektrotekhn. in-t svyazi.
Vyp. 2 (Materials of the Scientific and Engineering Conference. Leningrad
Electrotechnical Communications Institute. Vyp. 2), Leningrad, 1970, pp 191-
196 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8A75)

Translation: This article contains an investigation of an equivalent noise EMF
of an amplifying cascade in a channel transistor and its dependence on frequency.
The contribution of various noise sources characterizing the equivalent cascade
circuit to this EMF is estimated.

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USSR

UDC: None

POPOV, E. K., Master of Sports USSR, Central State Institute of Physical Culture, Order of Lenin

"Method of Checking the Accuracy of Space-Time Differentiation in Trampoline Jumping"

Moscow, Teoriya i praktika fizicheskoy kultura, No 7, Jul 70, pp 20-21

Translation: The method described is designed for especially accurate measurement of the duration of flight in trampoline leaps and determination of the accuracy of the acrobat's subjective perception of the whole flight and its separate parts. The electronic instrument responsible for this was developed jointly by Yu. S. Karp and O. D. Plotnikov, et al., of the Latvian SSR Institute of Electronics and Computer Technology. It is a photoelectric device operating in conjunction with two counters of the PS-100 type. The external appearance of the instrument is shown in Fig. 1 and its schematic in Fig. 2. The basic idea of the method is to measure the time in which the photodiode is illuminated, which occurs when the acrobat, fulfilling the exercise, is in the air (the measurement system is shown in Fig. 3). The device consists of a 10 KH$_z$ sinusoidal voltage generator with parametric frequency stabilization (triode T$_1$), a voltage amplifier (T$_2$), a circuit for converting the sinusoidal voltage into rectangular pulses of positive polarity (tunnel diode TD$_1$), and a

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POPOV, E. K., Teoriya i praktika fizicheskoy kultura, No 7, Jul 70, pp 20-21

square pulse amplifier (T_3); it has two separate outputs, 1P and 2P, and an electronic switch for output 1P (T_4, TD_2). The device is powered from a 220-volt a-c circuit through a 14-volt rectifier with ferroresonant voltage stabilization. The theory of operation of the instrument is the following. When the power switch is thrown on, the oscillator begins to work and an a-c signal is applide from coil L_3 to amplifier T_2 through capacitor C_3, and to tunnel diode TD_1 through capacitor C_4. A negative voltage is sent to this tunnel diode through the R_4, D_6, R_5 network when the photodiode PD is dark, and the diode short-circuits the incoming signal to ground without putting it through to the counter system. When the photodiode is illuminated its resistance drops sharply and the supply circuit for the tunnel diode TD_1 is shunted through open triode T_5; as a result, the negative voltage on the tunnel diode drops, the diode is instantaneously thrown to the negative part of the volt-ampere characteristic, and under the influence of the sinusoidal voltage, begins to operate as a square-plus shaping circuit. These pulses, amplified by triode T_3, pass to the input of counter 2P and through the divider diode D_7 to counter 1P. Both devices count pulses until the subject, at the moment

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USSR

POPOV, E. K., Teoriya i praktika fizicheskoy kultura, No 7, Jul 70, pp 20-21

perceived by him to be the correct one, presses microswitch Sw_2. A large
negative voltage is then applied to tunnel diode TD_2, triode T_4 conducts, and
the signals applied to the first counter are grounded to halt the pulse-
counting by this circuit. The second counter continues to count pulses until
photodiode PD is again darkened. To return the circuit to its initial state,
the supply circuit must be broken by the power switch PS. The photodiode and
its illuminator are arranged such that the light ray just touches the lower
edge of the trampoline net when the latter is deformed under the weight of the
acrobat standing on it (see Fig. 3). This switches the time-measuring device
on or off at exactly the moment of transition from the acrobat's supported
state to the unsupported state, and vice versa. Since the duration of flight
is a function only of its height, we have compiled a special table through
which the time can easily be converted into distance. The table shows the
maximum number of pulses corresponding to each centimeter of jump height from
0 to 200 cm and, at intervals of 5 cm, the maximum number of pulses correspond-
ing to heights from 200 to 300 cm. The device has been exhibited at the
Fifteenth Latvian Republic Radio Builders Show and was mentioned for a prize.

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POPOV, E. K., Teoriya i praktika fizicheskoy kultura, No 7, Jul 70, pp 20-21

Table for Converting Jump Height to Duration of Flight

Cм	0	1	2	3	4	5	6	7	8	9
0	0 000	1 090	1 422	1 686	1 914	2 118	2 302	2 474	2 534	2 784
10	2 928	3 060	3 196	3 322	3 444	3 560	3 674	3 786	3 890	3 988
20	4 090	4 190	4 286	4 380	4 474	4 562	4 650	4 738	4 824	4 908
30	4 990	5 072	5 152	5 230	5 306	5 382	5 458	5 532	5 606	5 680
40	5 750	5 820	5 890	5 960	6 026	6 094	6 160	6 226	6 296	6 356
50	6 420	6 482	6 546	6 608	6 670	6 730	6 790	6 850	6 910	6 970
60	7 028	7 085	7 142	7 199	7 256	7 312	7 366	7 422	7 478	7 532
70	7 586	7 639	7 692	7 745	7 798	7 851	7 902	7 953	8 006	8 055
80	8 105	8 156	8 206	8 255	8 303	8 353	8 403	8 450	8 497	8 546
90	8 595	8 642	8 689	8 736	8 782	8 828	8 874	8 919	8 964	9 010
100	9 056	9 102	9 146	9 190	9 235	9 279	9 323	9 366	9 410	9 455
110	9 498	9 540	9 583	9 625	9 666	9 709	9 752	9 793	9 835	9 877
120	9 918	9 959	9 999	10 039	10 080	10 121	10 161	10 201	10 241	10 281
130	10 320	10 359	10 399	10 439	10 478	10 517	10 555	10 593	10 628	10 670
140	10 710	10 748	10 785	10 825	10 862	10 899	10 936	10 973	11 010	11 048
150	11 082	11 119	11 156	11 193	11 228	11 265	11 302	11 336	11 373	11 408
160	11 445	11 479	11 516	11 550	11 588	11 622	11 656	11 693	11 728	11 762
170	11 796	11 830	11 865	11 899	11 933	11 968	12 002	12 036	12 070	12 105
180	12 139	12 170	12 205	12 239	12 273	12 305	12 339	12 370	12 405	12 436
190	12 470	12 502	12 536	12 568	12 602	12 633	12 664	12 696	12 730	12 762

Cм	0	5	10	15	20	25	30	35	40	45
200	12 793	12 953	13 108	13 262	13 413	13 565	13 716	13 866	14 010	14 156
250	14 299	14 442	14 582	14 722	14 859	14 996	15 133	15 268	15 399	15 530

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POPOV, E. K., Teoriya i praktika fizicheskoy kultura, No 7, Jul 70, pp 20-21

NOTE: Find the value for the flight duration (in ten-thousandths of a second) in the table which is closest to the indication of the instrument but somewhat higher than it. Then, in the extreme left column of the corresponding line, find the tens and hundreds of centimeters, and in the upper line of the corresponding column find the units of centimeters. Finally, find the tens and hundreds of centimeters in the lower part of the table in the same way, and find the units of centimeters (with an interval of 5 cm) in the third line from the bottom.

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POPOV, E. K., Teoriya i praktika fizicheskoy kultura, No 7, Jul 70, pp 20-21
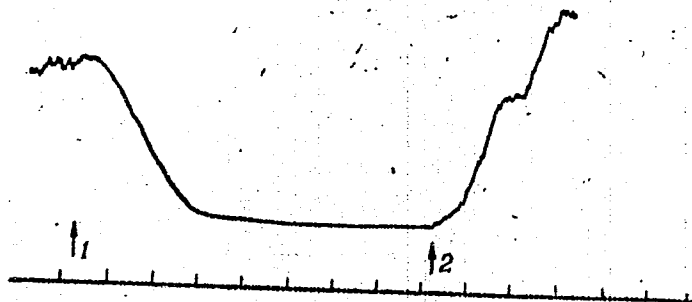
Fig. 1. Equipment Designed for the Research: 1) Pulse oscillator and control system; 2) Photosensor; 3) Illuminator; 4) Executing switch; 5) Counters.

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POPOV, E. K., Teoriya i praktika fizicheskoy kultura, No 7, Jul 70, pp 20-21
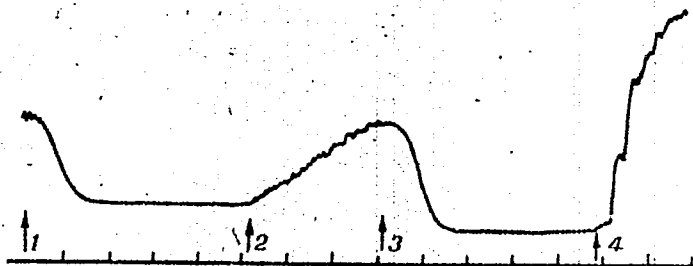
Fig. 2. Basic Schematic of the Equipment

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POPOV, E. K., Teoriya i praktika fizicheskoy kultura, No 7, Jul 70, pp 20-21
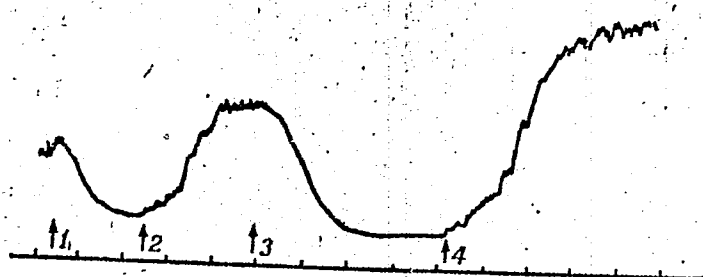
Fig. 3. System for Measuring Acrobat's Time of Flight in Trampoline Jumping

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Popov, F. D.

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Perminov, V. D., and Ye. Ye. Solodkin.
*Axisymmetric bodies with minimum
resistance at a specific heat flow to the
surface.* IN: Uchenyye zapiski Tsentral'no-
go aero-gidrodinamicheskogo instituta, v. 2,
no. 6, 1971, 32-40. (RZhMekh, 5/72,
no. 5B345)

For axisymmetric bodies with a flat leading edge and a
mildly sloping lateral surface, an approximate solution is given to a
variational problem of the shape of a body of minimal resistance in a
hypersonic gas under a specific total heat flow to the surface. A
modified Newtonian formula is used for calculation of the pressure
distribution. The formulated isoperimetric problem of the shape of
an axisymmetric body of given dimensions with a flat leading edge,
and minimum resistance at a given total heat flux, is solved numeri-
cally by a modified method of local variations at values of $M_\infty = 6$,
10, and 30, and $R_0 = 10^6$. It is shown that, under the specified
conditions, the requirements of minimal resistance and minimal heat
flow to the body surface are contradictory.

Popov, F. D., and I. M. Breyev. *Calculation
of supersonic flow around blunt bodies by the
finite-difference method.* IN: Trudy II
Respublikanskoy konferentsii po aerogidromekhanike,
teploobmenu i massoobmenu. Sektsiya "Aerodinamika
bol'shikh skorostey". Kiyev, Kiyevskiy universitet,
1971, 50-55. (RZhMekh, 5/72, no. 5B336)

A finite-difference scheme is proposed for the calculation of
static, mixed, axisymmetric flow over the nose section of a blunt body
in a supersonic ideal gas. The shock layer considered is transformed

UDC 533.601

USSR

BREYEV, I. M., POPOV, F. D.,

"Finite-Difference Scheme for Calculating Steady State Flows Behind a De-parted Shock Wave"

<u>Trudy Leningradskogo Politekhnicheskogo Instituta, Aerotermodinamika</u>
(Works of the Leningrad Polytechnical Institute, Aerothermodynamics),
No 313, 1970, pp 13-20

Translation: This paper introduces a finite-difference scheme for calcu-lating a steady-state mixed (up to supersonic) flow behind a departed shock wave. In solving the difference equations, the method of matrix expansion is used. Here, considering the elliptic nature of the problem, the system of difference equations is not expanded during the iteration process into equations along individual rays, but it is solved along all the rays simultaneously. Accordingly, the matrix expansion method is generalized to the case where the matrices are cellular. The calcula-tions demonstrated that by comparison with other methods, the proposed scheme insured high accuracy of the calculations with significantly

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USSR

BREYEV, I. M., et al., Trudy Leningradskogo Politekhnicheskogo Institute, Aerotermodinamika(Works of the Leningrad Polytechnical Institute, Aerothermodynamics), No 313, 1970, pp 13-20

lower expenditures of machine time. There are two tables, 1 illustration and a 5-entry bibliography.

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THE TEMPERATURE DEPENDENCE OF THE SUBLATTICE MAGNETIZATION OF LITHIUM FERRITE-CHROMITES

V. I. Nikolayev, F. I. Popov, V. M. Cherepanov

The Mossbauer effect for Fe^{57} nuclei in the ferrite $Li_{0.5}Fe_{1.1}Cr_{1.4}O_4$ is investigated in the temperature interval between 77 and 500° K. The purpose of the present work was to elucidate the character of the correlation between the temperature dependences of the effective magnetic field acting on the atomic nucleus and of the «own» sublattice magnetization. Within the accuracy of the experiments the effective magnetic fields for both ferrite sublattices were proportional to the sublattice magnetization. For the experiments a ferrite with a compensation point was specially chosen. Magnetizations of the ferrite sublattices are derived from data on measurements of the effective field and magnetization of the sample. It is shown that the temperature dependence of the

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sample magnetization can be described by the Neel model. For both types of sublattices the temperature dependence of the magnetic moment is of the Weiss shape; this indicates strong AB-interaction. Despite the presence of a magnetic compensation point in ferrite, a «weaker» of the two sublattices can be separated only with strong reservations (it turns out to be an octohedral sublattice).

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FROM: FBIS Daily Report, Soviet Union, 4 March 1970, Vol III, Nr 43,
p C-3 - C 6

USSR —
MANAGEMENT DEPENDENT ON SCIENCE OF CONTROL

Moscow PRAVDA 28 Feb 70 p 2 L

[Article by G. Popov, Moscow State University control problems laboratory chief:
"Science Must Control"]

The CPSU Central Committee December plenum and the USSR Supreme Soviet seventh
session devoted great attention to problems of controlling the economy. Further im-
provement in the economic reform, raising economic leaders' qualifications and their
requalification, rationalizing production and managerial organizations' structure,
precise definition of the rights and obligations of every working person, more ex-
tensive use of computer equipment in control--these are the primary problems whose
resolution will permit us to sharply increase the efficiency of public production.
Successful progress in the reform depends to a large extent on developing a network of
financially autonomous production associations in the branches of the national economy.
This was discussed as early as the CPSU Central Committee September (1965) plenum.
Production associations are able to realize most fully all the advantages which the

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new system of planning and material incentive gives to the enterprises. In our view, associations also have need for a new and more extensive system of directive indicators. It is also very important that the creation of associations should permit the role of branch ministries to be defined in the new way and freed from operational control of enterprises' work. The attention of ministries will then be concentrated on the sort of problems which are most effectively resolved at branch level: execution of a unified technical policy, organization of research on technical and economic problems which are common to an entire branch, working out of prospects and long-term prognoses on the branch's development, and increasing the qualifications of cadres and other people. The reform's important task is to energetically introduce the modes and methods of the new system of planning and incentive into the work of ministries and planning, financing, supply and sales, credit, and other organs.

It would be incorrect, though, to reduce the matter simply to a rationalization of branch control. Is it possible, for instance, to achieve major acceleration in the development of the branches of machine building without changing its structure in such a way as to make repair work a specialized aspect? Also extremely important is the territorial approach, which in a number of cases permits the resolution of such economic problems as the complex utilization of raw materials, the distribution of production and of new capital investments, the development of repair and other auxiliary and servicing concerns, transport construction, and the growth of cities. Long-term development plans are needed for territorial complexes. As specifications these plans can-

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not be established for 5-year periods and should at best be reckoned in 10-year or 15-year terms. For instance, such a plan has been necessary for the West Siberian oil-bearing zone.

There is no doubt that mathematical methods and models are important means for increasing the efficiency of control. The introduction of computers demands a reconstruction of operational control, accounting, and dispatching. But on the broad scale it is not control that must be reconstructed for the sake of controlling machines but, on the contrary, the choice of computer that must be determined by the control system adopted. Mathematical methods and computers are one of the instruments for rationalizing control and must be regarded as a part of the general system of work on improving control. If they are separated from the other sectors or are advanced unjustifiably they will not produce their intended effect.

The reform has developed and strengthened material incentive, but it would be a mistake to think that everything has already been done in this field. There are still many people who do not wish to make extra efforts in their labor in return for bonuses, however large they may be. There are also people who regard their wages as payment for appearing at work.

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AN0042683

The improvement of control must rely on the science of control and must promote its development. At the same time a system of organized measures is needed to improve control constantly and effectively. These measures include assigning responsibility to small structural subunits within the leading economic organs for the rationalization of control, the creation of design and consultative firms specializing in this field; and organizing special courses and schools attached to universities and higher educational establishements for postgraduate training of leaders from among specialists who give a good account of themselves. This entire complex of interconnected measures requires the creation of an authoritative organ responsible for the simultaneous resolution of three interconnected tasks: the rationalization of the system of control, the training of leading cadres and the increasing of their qualifications, and the organization of scientific research in the field of control. The improvement of economic control in the present stage is the decisive condition of our further economic growth.

19760787

USSR

POPOV, G. A.

"Algorithmizing the Structural Investigation of Geometric Objects"

Translation: The paper considers individual questions of algorithmizing
the geometric structures of elements. These problems relate to construct-
ing systems and structures of initial information and the formulation of
some complex problems of structural analysis of designs in an automated
design system.

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POPOV, G. KH.

Problems in Management Theory

POPOV, G. Kh.

129. USSR

Problemy Teorii Upravleniya (Problems in Management Theory), Moscow, "Ekonomika," 1970, 207 pp

Excerpt: The book, written by the chief of the Laboratory for Problems in Social Production Management of Moscow State University named M. V. Lomonosov, considers a wide range of theoretical questions.

The author first investigates the management of socialist social production itself, and defines the general and specific features inherent in it.

This is followed by a study of the system of sciences which study management. The author devotes special attention to the question of the place of an independent management theory in the system of management sciences. The book considers the possibility and the necessity of a management theory, its subject matter, and the content of its two component parts -- administration theory and the art of management.

The study of the methodological problems of management theory ends with an analysis of questions regarding the formation of management science, which is needed so much in practical activity. The author believes that the successful creation and development of this science requires the simultaneous and intercoordinated solution of three problems: creation of a permanent system of management rationalization in the national economy; a system for the training and continuing education of management personnel; and organization of research in the field of management.

POPOV, G. Kh., Problemy Teorii Upravleniya, "Ekonomika," 1970, 207 pp

TABLE OF CONTENTS

Organophosphorus Compounds

USSR   UDC: 632.95

POPOV, G. L., BAINA, N. F., and SMOBOROVSKIY, L. A.

"A Method for Preparing Mixed O-Alkyl-S-(β-Carboxy, β-Alkyl)ethylalkyl-thiophosphonates"

USSR Author's Certificate No 253062, filed 13 June 68, published 24 Feb 70 (from RZh-Khimiya, No 22, 25 Nov 70, Abstract No 22 N640 P by T. A. Belyayeva"

Translation: Compounds with the general formula $RP(O)(OR')SCH_2CH(R'')COOH$ (I) (R and R' = alkyl; R'' = H, alkyl, aralkyl) are obtained from the reaction of O-alkyl-alkylthiophosphonates with α-subst. acrylic acids in the presence of bases. For example, 3.6 of acrylic acid is added to a mixture of 7 g of O--ethyl-methylthiophosphonate and 0.5 g of EtO-Na in 10 ml of C_6H_6 at $65°$, heated for 12 hours at 65%, and washed with water, yielding 5.6 g of I (R' = Et, R = Me, R'' = H), $C_7H_{15}O_4PS$ are obtained in the presence of Et_3N as a catalyst, boiling point $103-4°/0.025$, $n^{20}D$ 1.4785. I possess insecticidal properties.

1/1

USSR   UDC: 533.9.08

POPOV, G. P., Moscow "Order of Lenin" Aviation Institute imeni Sergo Ordzho-
nikidze

"A Laser Interferometer for Plasma Diagnosis"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki,
No 8, Mar 72, Author's Certificate No 330380, Division G, filed 20 Mar 70,
published 24 Feb 72, p 136

Translation: This Author's Certificate introduces a laser interferometer
for plasma diagnosis. The device contains a laser, a passive resonator
in which one of the mirrors is movable and is connected to a piezoelectric
element for electromechanical stabilization of the optical length of the
resonator, and a vessel for plasma located in the resonator. As a dis-
tinguishing feature of the patent, measurement accuracy is improved by using
a laser which emits simultaneously on two wavelengths and making the movable
mirror semitransparent for both wavelengths. Located outside the resonator
behind the mirror is a monochromator with two output slots and two radia-
tion receivers. The signal from one receiver is fed through an amplifier
to the piezoelectric element, and the signal from the other receiver is fed
to an oscillograph.

1/1

POPOV, G. P.

Radar

Popov, G. P. Inzhenernaya psikhologiya v radiolokatsii
(Sistema "Indikator-Operator") [Engineering Psychology in Radar
(The Indicator-Operator System)] (Engineering Psychology in Radar.
Moscow, Izd-vo "Sovetskoye Radio," 1971. 144 pages, printing of
11,000 copies, price 41 kopecks.

ABSTRACT

In this book, problems of the application of engineering
psychology data in the investigation and evaluation of the
capabilities of circular-scanning radar nets (RLS) and of de-
vices for representing information are considered.

Special attention is devoted to the statistical analysis
of the process of detection of signals by the RLS operator, to
a description of methods of calculating the characteristics of
the detection of signals, with consideration of the characteristics of
logical features of the operator, and methods of finding optimum
forms of communication in the indicator-operator link.

The book is intended for the general circle of special-
ists interested in the designing and operation of indicator
devices for RLS and devices for representation of special-
mation, as well as graduates and students specializing in the
field of radar and automation of control.

56 drawings, 7 tables, bibliography of 58 titles.

- 1 -

1/2   020   UNCLASSIFIED   PROCESSING DATE--30OCT70
TITLE--REDUCTION OF A MGFE SUB2 O SUB4, MGV SUB2 O SUB4 SOLID SOLUTION -U-

AUTHOR-(04)-PISMENSKAYA, G.M., BALAKIREV, V.F., POPOV, G.P., CHUFAROV,
 G.I.
COUNTRY OF INFO--USSR

SOURCE--IZV. VYSSH. UCHEB. ZAVED., CHERN. MET. 1970, 13(3), 9-12

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--IRON OXIDE, MAGNESIUM COMPOUND, VANADATE, VANADIUM COMPOUND,
 METAL REDUCTION, SOLID SOLUTION, X RAY DIFFRACTION, HYDROGEN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1998/0722   STEP NO--UR/0148/70/013/003/0009/0013

CIRC ACCESSION NO--AT0121381
                    UNCLASSIFIED

UNCLASSIFIED   PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AT0121381

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REDN. BY H OF THE MGV SUB0.25 FE SUB1.75 O SUB4 SOLID SOLN. OBTAINED FROM THE OXIDES WAS STUDIED BY X RAY DIFFRACTION AT 1000DEGREES. THE PLOT OF THE PARTIAL EQUIL. O SUB2 PRESSURE VS. THE PERCENT REDN. SHOWED 2 BRANCHES CORRESPONDING TO SPINEL AND OXIDE PHASES AT SMALLER THAN OR EQUAL TO 33.4PERCENT OF REDN., AND TO MGV SUB2 O SUB4, FE, AND MG SUBX FE SUB1-X O PHASES AT HIGHER STAGES OF REDN. THE AMT. OF FE SUB3 O SUB4, FORMED AS AN INTERMEDIATE PHASE IN THE 1ST REGION, WAS MAX AT 14PERCENT REDN.   FACILITY: VOLGOGRAD. POLITEKH. INST., VOLGOGRAD, USSR.

UNCLASSIFIED

Popov, G. S.

JPRS 57351

27 Oct 72

UDC: 614.2:31

INTEGRATED (OVERALL) EVALUATION OF INDICES IN THE PUBLIC HEALTH SYSTEM

[Article* by Professor V.V. Kanep, G.S. Popov, B.Ts. Ol'shansky, Candidate of Medical Sciences, P.I. Tsukerman, Moscow, Sovetskoye Zdravookhraneniye, Russian; No 9, 1972, submitted 14 February 1972, pp 20-24]

In the public health system it is often necessary to compare the efficiency of institutions or agencies thereof to demonstrate those that are ahead or lagging for the purpose of stimulating advancement of the entire system. An analogous need also arises when assessing the dynamics of development of specific institutions, when data pertaining to operation of one of them over a period of several years is used as compared objects. The use of concrete indices is ineffective for such purposes: an institution may be ahead with respect to some indices and behind with respect to others; furthermore, a person is not able to cope with concurrent comparison of many hundreds of parameters. Yet the choice of a few indices would introduce considerable subjectivity and would not reflect the overall activity. It is therefore logical to use the set of all existing indices to make an overall evaluation. We use the term overall evaluation, from the standpoint of logic, as a single figure obtained on the basis of many parameters of concrete signs which could then be evaluated by means of a scale of qualitative characteristics.

Overall evaluation involves solving two problems: is the initial information necessary and sufficient to characterize the overall criterion? Is the shift from initial information to overall evaluation adequate?

Professor L.Ye. Polyakov and D.M. Malinsky, candidate of medical sciences, tried to find such an overall criterion as national health status. The authors used the method of overall probability evaluation (OPE).

*This is a response to the article by Professor L.Ye. Polyakov and D.M. Malinsky entitled "A Method of Overall Probability Evaluation of National Health Status," Sovetskoye Zdravookhraneniye, No 3, 1971.

The editorial board is aware of the debatable nature of evaluating some indices shown in Table 1.

- 24 -

USSR   UDC 576.858.25.083.1

POPOV, G. V., RUBIN, S. G., and CHUMAKOV, M. P., Institute of Poliomyelitis
and Viral Encephalitides, Academy of Medical Sciences USSR

"Gel Chromatography of Arbovirus Suspensions on Sepharose"

Abstract: Investigations were conducted to determine the feasibility of gel
chromatography of some arboviruses (tickborne encephalitis virus, Japanese
encephalitis virus, Omsk hemorrhagic fever virus, West Nile fever virus)
on sepharose 4 B; and to combine concentration of arboviruses with polye-
thyleneglycol with subsequent purification on sepharose. The hemagglutinating,
precipitating, and infectious properties of purified arbovirus suspensions
were also studied. The main columns were 11 to 13 X 300 mm; buffer -- 0.05 M
boric acid and sodium hydroxide to pH 8.0 with 0.5 M sodium chloride; amount
of suspension analyzed -- 0.5 to 2 ml; flow rate of liquid -- 25 ml/hour;
size of fractions -- 0.5 to 2 ml. Native and concentrated viral suspensions
obtained in tissue cultures and native brain suspensions were subjected to
gel chromatography, which produced high yields of purified, antigenically
active and infectious virus. The procedure eliminated hemagglutination in-
hibitors and other ballast substances. It also freed the peak fractions from
1/2

USSR

POPOV, G. V., et al., Voprosy Virusologii, No 5, 1971, pp 615-620

residues of polyethyleneglycol, thereby increasing the stability of the preparations.

2/2

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UDC: 621.317.715(088.8)

USSR

REZVYAKOVA, Z. N., POPOV, G. V.

"An Instrument for Measuring Random Signal Levels"

USSR Author's Certificate No 264542, filed 27 Apr 54, published 17 Jun 70
(from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A114 P)

Translation: This author's Certificate introduces a magnetoelectric instru-
ment designed for producing uniform damping, reducing the time required for
the coil to reach its position of rest, and giving readings which are a
logarithmic function of the applied voltage. E. L.

1/1

USSR

POPOV, G. V., and MARTINENKO, M. G., Scientific Research Laboratory of Physiology, Cherkassy Pedagogical Institute

"Dark Adaptation during Gravitational Loads in Athletes"

Abstract: The dynamics of dark adaptation of the visual analysor during passive changes in body position was studied in athletes with various qualifications and specializations. The adaptation time was determined in the initial state, immediately after a shift in body position on a rotatory stand, and 2 min after this shift. The initial value of the adaptation time was less for highly qualified athletes than for nonathletes. Initial adaptation took place most rapidly for gymnasts, acrobats, and wrestlers. Changes in the position of the body from horizontal to vertical or vice versa were accompanied by phase shifts in the time of dark adaptation. Adaptation was initially impaired, followed by more or less complete normalization. The rate and degree of restoration were directly related to the extent of physical training and to the adaptation of the subjects to shifts in body position. It is assumed that disturbances in the blood supply to the brain and retina as well as general reactions of the stress type, were affecting the shifts in dark adaptation under experimental conditions.
1/1

USSR   UDC 539.3

POPOV, G. Ya., Odessa

"The Plane Contact Problem for a Linear-Deformable Base with Coupling Forces"

Moscow, Prikladnaya Matematika i Mekhanika, Vol 37, No 2, Mar - Apr 1973,
pp 254 - 261

Abstract: A spectral relationship among Jacoby polynomials (more general than
that used by the author in Volume 30, Number 3 of this journal) is the basis
for a method of solving the problem of plane contact for a linearly deformable
base of the general class, a special case of which is the half space with a
modulus of elasticity $E = E_\nu z^\nu$ $(0 \leq \nu \leq 1)$.

    This is apparently the first time an exact solution has been given for the
plane problem of the depression of a coupled stamp and it has been shown that the
contact stresses at the border of the stamp, as for an ordinary half-space,
extended to infinity with an infinite number of sine changes. A method of
approximate solution is given for the bending of a shaft of finite length coupled
to a linearly deformable base. Several errors in the article by Shirinkulov
(Dokl. AN Uz.SSR, No 7, 1969) on this same special case are pointed out. '
1/1

USSR   UDC 539.3

PASKALENKO, A. A. and POPOV, G. Ya. (Odessa)

"The Problem of an Elastic Semi-Infinite Cover Plate Coupled to a Linearly Deformable Base"

Moscow, Mekhanika Tverdogo Tela, No 3, May-Jun 73, pp 79-86

Abstract: An exact solution of the contact problem concerning an elastic semi-infinite cover plate coupled to an elastic half-plane has been obtained by various means. An exact solution of this problem is given for a linearly deformable base of the general type and, in particular, for a base in the form of a half-plane with a modulus of elasticity that varies in accordance with a power law. A numerical realization of the obtained exact solution is given. 1 table. 11 references.

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USSR

UDC 539.3

POPOV, G. Ya., Odessa

"Plates on Linearly Deformed Basis (review)"

Abstract: This review, containing three sections, includes works dedicated to three-dimensional problems of bending of plates on a linearly deformed base. The first section includes problems with the area of contact in the form of a plane (unlimited plates), the second includes problems with the area of contact in the form of a semiplane (semi-infinite plates), while the third section includes problems with the area of contact in the form of a circle or a ring. The mathematical formulation of most of the problem is presented as applicable to linearly deformed basis, significantly extending all types of basis known earlier.

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UNCLASSIFIED   PROCESSING DATE--11DEC70

TITLE--THE CONTACT PROBLEM OF AN ELASTIC HALF PLANE TO WHICH IS FIXED A
SEMI INFINITE ELASTIC BAR -U-

AUTHOR-(02)-VOROBYEV, V.L., POPOV, G.YA.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, PRIKLADNAYA MATEMATIKA I MEKHANIKA, NO 2, 70, PP 354-359

DATE PUBLISHED-------70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, MATHEMATICAL SCIENCES

TOPIC TAGS--STRESS ANALYSIS, CONTACT STRESS, ELASTIC PLATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605041/C03 STEP NO--UR/0040/70/000/002/0354/0359

CIRC ACCESSION NO--AP0142725

UNCLASSIFIED

2/2   018
CIRC ACCESSION NO--AP0142725
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONTACT PROBLEM OF AN ELASTIC
SEMI INFINITE PLATE TO WHICH IS FIXED ON ITS ENDS A SEMI INFINITE BAR IS
INVESTIGATED FOR THE CASE THAT A UNIT FORCE ACTS ALONG THE AXIS OF THE
BAR AT AN ARBITRARY DISTANCE FROM ITS END. THE TANGENTIAL CONTACT
STRESS AND THE NORMAL STRESS AT AN ARBITRARY CROSS SECTION OF THE BAR
ARE DETERMINED ASSUMING NO BENDING MOMENTS ACTING ON THE BAR AND USING A
METHOD PROPOSED BY G. YA. POPOV. FOR SOLVING A SIMILAR PROBLEM WITH A
FORCE ACTING PERPENDICULAR TO THE AXIS OF THE BAR AND NEGLICTING THE
TANGETIAL CONTACT STRESS. FROM DERIVED INTEGRAL EQUATIONS, VALUES OF
THE TANGENTIAL AND NORMAL STRESSES ARE CALCULATED FOR VARIOUS DISTANCES
OF THE FORCE FROM THE END OF THE BAR. TABULATED VALUES DEMONSTRATE THAT
AT DISTANCES B IS GREATER THAN OR EQUAL TO 1.4 THE STRESSES MAY BE
CALCULATED FROM FORMULAS FOR AN INFINITE BAR.

1/2   034   UNCLASSIFIED   PROCESSING DATE--02OCT70
TITLE--STELLAR SUPPER -U-

AUTHOR--PUPOV, I.

COUNTRY OF INFO--USSR

SOURCE--KRASNAYA ZVEZDA, JUNE 16, 1970, P 4, COLS 1-5

DATE PUBLISHED--16JUN70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, SPACE TECHNOLOGY

TOPIC TAGS--DIET, COSMONAUT, MANNED SPACECRAFT, VITAMIN/(U)SOYUZ 9 MANNED
SPACECRAFT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/0895   STEP NO--UR/9008/70/000/000/0004/0004

CIRC ACCESSION NO--AN0107424
                    UNCLASSIFIED

2/2   034   UNCLASSIFIED   PROCESSING DATE--02OCT70
CIRC ACCESSION NO--AN0107424
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ARTICLE DISCUSSES THE DIET OF
THE "SOYUZ-9" ASTRONAUTS. THEIR FOODS PACKED IN ALUMINUM TUBES AND
CONTAINERS ARE SUPPLEMENTED BY A, B, B SUB 2, ETC., VITAMIN COMPLEX
TAKEN TWICE A DAY. THE ASTRONAUTS DIET CALLS FOR 2,600 LARGE CALORIES
AND ABOUT 2,600 ML OF WATER PER MAN PER DAY.

UNCLASSIFIED

SARKISOV, A. A., POPOV, I. A., LUK'YANOV, A. A.

"The Mechanism of Condensation of Steam Bubbles in a Steam-Water Mixture
Under the Influence of Shock Loads"

Abstract: Experimental data are presented on the collapse of steam bubbles
in boiling water under the influence of shock loading. The studies were
performed with static pressures in the experimental installation of 1, 10,
20 and 30 bar and under the influence of vertical impact loadings with rela-
tive accelerations of 35, 50, 75 and 100 g.
    The steam-water mixture was observed at the moment of and following im-
pact through quartz glass by high-speed motion picture photography. Analysis
of the experimental data showed that the impact action increased the pressure
in the boiling liquid. The steam bubbles, entering the field of variable
pressure, change their configuration, and the process of bubble destruction
is an oscillating process. The time of condensation of the bubble depends on
the acceleration applied to the steam-water mixture, the static pressure and
bubble size.

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USSR   UDC 536.423.4:531.66

Condensation of steam bubbles results from two effects: heat exchange
and fluid inertia. An increase in static pressure decreases the significance
of heat exchange between the steam bubble and the water during condensation
and strengthens the effect of the inertia of the liquid, resulting from the
change in pressure.

The results of experiments are presented in the form of dependences
$R/R_0 = f(\tau_n)$, where $\tau_n = 4/\pi \ Ia^2 \ at/R_0^2$ is the dimensionless time, R and R_0
are the instantaneous and initial radii of a steam bubble; a is the heat con-
ductivity factor; t is time.

The experimental curves are generally similar to the theoretical curves,
but the rate of condensation of steam bubbles is somewhat higher.

The rate of destruction of bubbles in the experiment performed is explained
primarily by the significant speeds of transfer (floating) of bubbles resulting
from impact of the experimental sector with a barrier. 3 Figures; 5 Biblio.
Refs.

2/2

SINITSYN, V. A., POPOV, I. A., BORODULIN, G. I., MAL'TSEV, B. N., KOTKOV, A. V.

"Experimental Industrial Tests of the MSD-1 Phototachymeter"

Abstract: The paper gives basic technical data and the results of experimental industrial tests of the MSD-1 phototachymeter developed by the All-Union Scientific Research Institute of Mining Geomechanics and Surveying for measuring distances in underground surveying jobs. The instrument has a range of action of 1-300 meters with an accuracy of $\pm(2 \text{ mm} + 5 \cdot 10^{-6} D)$. Measurements take 3-8 minutes. The test results show that the instrument is highly accurate and can be used in special geodetic engineering jobs as well as in surveying work. One figure, two tables.

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USSR   UDC: 621.373.521.1

POPOV, I. A.

"Keying Mode of a Single-Cycle Transistorized Oscillator"

V sb. Poluprovodn. pribory v tekhn. elektrosvyazi (Semiconductor Devices in Elec-
trical Communications Technology--collection of works), Vyp. 5, Moscow, "Svyaz'",
1970, pp 15-35 (from RZh-Radiotekhnika, No 7, Jul 70, Abstract No 7D364)

Translation: The author considers the theory of the little known keying mode of a
transistorized generator of harmonic oscillations in which the transistor either
passes current in the saturation state, or is in the cutoff state. It is shown
that the keying mode may give an extremely high efficiency for the collector circuit
of the oscillator with little sacrifice of power gain as compared with the ordinary
mode. One illustration, eight tables, bibliography of 13 titles. Resumé.

1/1

USSR

BREZHNEVA, N. YE., DEMENT'YEV, V. D., KAPSHANINOV, YU. I., and POPOV, I. B.

"Ion Exchange Kinetics of Rare Earth Elements on NaX Zeolite"

Abstract: Ion exchange kinetics of La^{3+}, Ce^{3+}, Pr^{3+}, Nd^{3+} and Sm^{3+} on the synthetic zeolite NaX was studied. It was shown that the determining step in ion exchange process is the stage of the penetration of ions into the ion exchange resin. The diffusion coefficients are constant for each ion up to 50% of exchange; they increase with rising exchange temperature and are inversely proportional to the ionic radius. The function $\log D_i - \frac{1}{T}$ is linear for all ions in the temperature range studied. The activation energy of this process decreases proportionately to the decrease in ionic radius. It was shown that the cations are not dehydrated in the ion exchange process. By extrapolation the energy of activation and coefficient D_o for the diffusion of Pm^{3+} ion into the NaX zeolite have been determined.

1/1

USSR   UDC 66.074.7:546.65

BREZHNEVA, N. Ye., DEMENT'YEV, V. D., KAPSHANINOV, Yu. I., and POPOV, I. B.

"A Study of Ion Exchange Between Ceolites and Radioactive Rare Earth Elements"

Leningrad, Radiokhimiya, Vol XIII, No 3, 1971, pp 411-416

Abstract: Synthetic zeolites, which have greater radiation-chemical and thermal resistance than organic resins, are of particular interest in connection with their use in various areas of radiochemistry, especially their application in the sorption decontamination of radioactive waste, in the extraction of radioisotopes to concentrate them before burial, and in obtaining radiation sources. However, in regard to ion-exchange, no one has been able to secure substitution of the zeolite Na^+ and Ca^{2+} ions with the ions of a metal having a valence greater than 1 or 2, with the exception of the 27% exchange for A-type zeolite, and 60% exchange for X-type zeolite, achieved at the disadvantage of increase in the amorphous phase (trivalent cerium was the substitute ion). In the present study, previously dehydrated zeolite was used in conjunction with a complexing agent, on the assumption that the rare-earth ions would form with the agent adsorbed on the zeolite

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USSR

BREZHNEVA, N. Ye., et al., Radiokhimiya, Vol XIII, No 3, 1971, pp 411-416

just the same complexes as in a solution, while the complexes themselves, MeA^+ and MeA^{2+}, would behave as mono- and bivalent ions, and thus be capable of exchanges without the formation of a polar structure.

It is shown that maximum exchange capacity of NaX-type zeolites, for all elements studied, was the same (0.360 mg-equiv per 100 mg zeolite), and that the degree of substitution of Na ions was 82%. The following array of selectivity was found to be present: $La^{3+} > Ce^{3+} > Pr^{3+} > Nd^{3+} > Pm^{3+} > Sm^{3+}$; this holds up to about the level of 80% exchange, after which the order of selectivity is reversed. It was shown, further, that degree of exchange is quite independent of the concentration of the initial rare-earth element solution, at least within the range of solutions from 0.01 to 1 N. Finally, it was shown that the mobility of rare-earth ions in a zeolite is lower than that of sodium ions.

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USSR   UDC: 537.312.62

BRONNIKOV, A. N., POPOV, I. G., DIDKOVSKAYA, O. S.

"A Miniature Thermocryostat for Measuring the Electric Characteristics of
Nonlinear Dielectrics"

Elektron. tekhnika. Nauch.-tekhn. sb. Radiodetali (Electronic Technology.
Scientific and Technical Collection. Radio Parts), 1972, vyp. 1(26), pp
101-103 (from RZh-Radiotekhnika, No 12, Dec 72, abstract No 12D547 by A. K.)

Translation: The paper describes a miniature cryostat which operates in a
set with an MLCh-2M high-frequency bridge in the temperature range from
-80 to +165°C. The cryostat is designed for determining the capacitance,
loss tangent and leakage current of nonlinear dielectrics as functions of
temperature and electric field strength on different frequencies. The tem-
perature in the cryostat is monitored by a copper-constantan thermocouple
shielded by an electrostatic screen. Temperature is held constant with
an accuracy of 1-2°C. A conventional method is used for determining the
characteristics of nonlinear dielectrics with application of a DC field.
The error in determination of capacitance and loss tangent with regard to
the inherent capacitance and losses of the thermocryostat is no greater

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USSR

BRONNIKOV, A. N. et al., Elektron. tekhnika. Nauch.-tekhn. sb. Radiodetali, 1972, vyp. 1(26), pp 101-103

than the error of the MLCh-2M bridge. The minimum measurable loss tangent was 0.0002. The range of working frequencies of the thermocryostat is 0.1-10 MHz, maximum bias voltage is 7 kV. Liquid dielectrics can be used as the ambient for test specimens.

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USSR

ISAKOV, P. K., et al., Teoriya i Praktika Aviatsionnoy Meditsiny (The Theory and Practice of Aviation Medicine), Moscow, "Meditsina," 1971, 396 pp

The authors made no attempt to present all questions of aviation medicine without exception. In order to carry out such an attempt at the present time, a multi-volume publication would be needed. This refers particularly to the clinical aspects of aviation medicine. The specific etiological condition for the development and course of deviations in health caused by flight factors, analyzing the possibility of performing flights after suffering diseases, and the system and methods for medical monitoring of the state of health of flight personnel are all clinical aspects of aviation medicine which are elucidated in appropriate publications and, naturally, are treated in a limited manner here.

Table of Contents:

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medical specialization devote attention to questions of aviation medicine. Furthermore, biologists and psychologists participate extensively in developing the scientific propositions which are used in aviation medicine.

In comparison with other occupations, flying activity involves a very high degree of action by various extreme factors on the organism. Even a slight emergency, similar to one which on the ground could be eliminated without danger to the crew, may end in disaster in the air if a set of special measures is not envisioned. For this purpose, aviation doctors participate in evaluating each new type of airplane, beginning with its design and ending with flight testing, and they conduct medical and psychological selection of candidates for flight schools. All activity by flight personnel is under constant observation by aviation doctors who regulate the flying load and participate in evaluating the pilot's readiness to perform the flight assignment.

In this book the first attempt is made to show, along with a presentation of the theoretical aspects of aviation medicine, the possibilities for applying this knowledge in the aviation doctor's practice.

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USSR

ISAKOV, P. K., et al., Teoriya i Praktika Aviatsionnoy Meditsiny (The Theory and Practice of Aviation Medicine), Moscow, "Meditsina," 1971, 396 pp.

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USSR

ISAKOV, P. K., et al., Teoriya i Praktika Aviatsionnoy Meditsiny (The Theory and Practice of Aviation Medicine), Moscow, "Meditsina," 1971, 396 pp.

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USSR

ISAKOV, P. K., et al., Teoriya i Praktika Aviatsionnoy Meditsinay (The Theory and Practice of Aviation Medicine), Moscow, "Meditsina," 1971, 396 pp.

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USSR

ISAKOV, P. K., et al., Teoriya i Praktika Aviatsionnoy Meditsiny (The Theory and Practice of Aviation Medicine), Moscow, "Meditsina," 1971, 396 pp.

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USSR

ISAKOV, P. K., et al., Teoriya i Praktika Aviatsionnoy Meditsiny (The Theory and Practice of Aviation Medicine), Moscow, "Meditsina," 1971, 396 pp.

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USSR

ISAKOV, P. K., et al., Teoriya i Praktika Aviatsionnoy Meditsiny (The Theory and Practice of Aviation Medicine), Moscow, "Meditsina," 1971, 396 pp.

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USSR

ISAKOV, P. K., et al., Teoriya i Praktika Aviatsionnoy Meditsiny (The Theory and Practice of Aviation Medicine), Moscow, "Meditsina," 1971, 396 pp.

USSR

ISAKOV, P. K., et al., Teoriya i Praktika Aviatsionnoy Meditsiny (The Theory
and Practice of Aviation Medicine), Moscow, "Meditsina," 1971, 396 pp.

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Steels

USSR   UDC 621.785.533:669.018.8

POPOV, I. N., PEREVERSEV, V. M., KOROLEV, P. G., ZHEREBKIN, O. A., and
NESTERENKO, V. I., Kursk Polytechnic Institute

"Cyclic Strength and Residual Stresses of Nitrocemented Steel Containing
Chromium and Nickel"

Abstract: The fatigue strength and residual stresses of 20KhGSNT nitro-
cemented steel containing chromium and nickel were experimentally investi-
gated. The fatigue strength on bending after nitrocementation did not
decrease, in comparison with cementation and temper hardening by repeated
heating. The high value of the endurance limit of 20KhGSNT nitrocemented
steel is a function of the presence on the surface of the nitrocemented layer
of compressive residual principal stresses, determined with the help of the
"PION 2" device. The presence of compressive residual stresses on the metal
surface results also from the analysis of sources of fatigue failures. Two
figures, five bibliographic references.

1/1

USSR

VARTANOVA, S. V., POPOV, I. V., PROCHUKHAYEV, M. V., Moscow

"Study of the Effect of the Angle of Opening of Conical Nozzles on the Flow Parameters of a Rarefied Gas"

Abstract: A study of gas flow in conical nozzles with half-opening angles $\alpha = 15-35°$ in the range of Mach numbers from 4-11 at static pressures at the cutoff section $p = 0.2-100$ n/m^2 is described. It is noted that there are many difficulties both in principle and of an engineering nature in producing a hypersonic flow of a low density gas in nozzles of wind tunnels. The growth of the boundary layer at the walls of the supersonic nozzle essentially limits the possibility of producing flows with large Mach numbers and sufficient isentropic cores. It is also observed that one of the methods of improving flow characteristics is cooling the nozzle walls so that the thickness of the boundary layer decreases and the effective angle of opening of the nozzle increases with a decrease in the temperature factor $t_w = T_w/T_0$. The

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effect of deep cooling (t_w = 0.135) on the flow parameters was investigated for a nozzle with an angle of opening α = 20°. The calculations provide an empirical relationship for calculating conical nozzles in the range of angles of half-opening from 15 to 35° and values of t_w from 0.135 to 1. Photographs are given showing that a shock wave of low intensity was formed in a nozzle with α = 15°, which is attributed to the interaction of the boundary layer with the nonviscous flow. A decrease in the thickness of the boundary layer in the region of the output cross section at the nozzle with deep cooling led to a decrease in the curvature of the outer boundary of the boundary layer and to a weakening of its interaction with the flow. An increase in the angle of the half-opening led to an increase in the interaction of the boundary layer with the flow and hence to an increase in the intensity of the shock wave. The photograph of the flow for α = 35° shows that at high angles of opening of the nozzle ($\alpha \geq 30°$), the flow formation approximates in character the flow formation in free jets.

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