

USSR

UDC 621.771.073.001.5

POLUKHIN, P. I., NIKOLAYEV, V. A., POLUKHIN, V. P., TERESHKO, A. K., and  
~~LEVINENKO, S. P.~~

"An Analysis of Operating Stresses in the Contact Zones of Four-High Rolling Mill Rolls"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya"  
Publishing House, No 64, 1970, pp 68-72

Translation: Data are given on the size and nature of the distribution of residual stresses in rolls 500 mm in diameter. Summary operating stresses in the rolling process are analyzed in dependence on the technological features: tension; ratio of internal friction; slippage. Four illustrations, three bibliographic entries.

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USSR

UDC 621.771.8

POLUKHIN, P. I., ZHADAN, V. T., BERKOVSKIY, V. S., FEDOSOV, B. M., and  
~~BYUKHOV, B. N.~~

"An Investigation of Forming in Flange Passes during Rolling of Stainless Steel"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya"  
Publishing House, No 64, 1970, pp 79-87

Translation: The results of an experimental study of the forming process during the rolling of square billets of Kh18Ni9Ti steel in open-flange passes are considered. Selection of the geometric parameters of the pass and billet is substantiated. Results are presented of an analysis of forming parameters as a function of the dimensions of the peak and the amount of roughing. Eight illustrations, one table, and five bibliographic entries.

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USSR

UDC: 621.774.31

POTAPOV, I. N., POLUKHIN, F. I., GUN, G. Ya., and AKHMEDSHIN, R. I.

"Questions of Optimizing the Process of Piercing on Cross-Screw Rolling Mills"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya" Publishing House, No 64, 1970, pp 23-28

Translation: The article considers the problem of using the mathematical theory of planning an experiment to determine the optimal value of mill productivity considering all factors influencing the process and limitations superimposed on the conditions under which cross-screw rolling occurs. The mathematical theory of the experiment makes it possible to work out principles of continuous optimal control over the process of cross-screw rolling with due regard for changes in the process related to the action of various uncontrolled factors. Two illustrations and 10 bibliographic entries.

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USSR

UDC 621.777.01

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.

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USSR

UDC 621.777.07

GUN, G. Ya., POLUKHIN, P. I., YAKOVLEV, V. I., GOLOVINOV, M. F., PRUDKAVSKIY, B. A., KORSETSKIY, G. M., RYZHOV, A. F., and BRUNILIN, A. I.

"Optimal Die Designing for Pressing Aluminum Alloys"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 139-199

Translation: Questions of optimal die designing are considered using a computer. On the basis of statistical processing of a number of existing dies and theoretical and experimental research, a method is proposed for calculating the working belts and location of the center of gravity of a section on the die. Five figures and three tables.

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USSR

UDC 621.777.07.001.5

GUN, G. Ya., POLUKHIN, P. I., RUTMAN, G. G., SKUGAREV, V. I., and KOSYREV, V. K.

"An Experimental Investigation of the Speeds of Effusion During Pressing in Two-Channel Dies"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 208-211

Translation: While developing the optimal design of pressing dies, it was necessary to make a series of experiments to analyze the kinematic conditions of the process. In this work, the influence of the ratio of the areas and shape of orifices in a flat two-channel die on the exit speed of sections being pressed is studied. A method is developed for measuring the speeds of metal effusion. The results obtained are evidence of the slight influence of section shapes on the nature of change in the speed as a function of the ratio of their section areas. A significant difference in metal effusion manifests itself where the ratio of areas is greater than two. Four figures and one bibliographic entry.

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USSR

UDC 621.777.07.001.5

GUN, G. Ya., ~~POLUKHIN, P. I.~~, YAKOVLEV, V. I., YUROV, Yu. V., KORITSKIY, G. M., PRUDKOVSKIY, B. A., and KUCHERYAYEV, B. V.

"Experimental Investigation of Speed Distribution During Pressing in Multi-channel Matrices"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 177-184

Translation: Results are given of experimental studies to determine the speeds of metal flow into a matrix with several channels, which form an established profile divided by crosspieces. Six figures and three tables.

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USSR

UDC 621.778.07

GUN, G. Ya., POLUKHIN, P. I., BAYER, K., and BELOV, M. I.

"Calculating the Deformed State in Drawing Shaped Sections"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya,"  
1970, pp 184-193

Translation: A description is given of an experiment to determine the picture of metal flow in the transverse plane during the drawing of shaped sections. On the basis of experimental data, a general method is developed for physical modeling of metal flow in a transverse direction on the basis of the electrohydrodynamic analogy. Analytical and graphic methods of determining the deformed state of the metal after drawing are worked out on the basis of the use of conformal transformation and electrohydrodynamic modeling. Twelve figures and four bibliographic entries.

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USSR

UDC 621.91.01

GUN, G. Ya., POLUKHIN, P. I., and SEN'KIN, Ye. N.

"Mathematical Modeling of the Cutting Process"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya"  
Publishing House, No 64, 1970, pp 41-52

Translation: In this article, the method of using potential fields to analyze the process of chip formation during cutting is considered. Analytical formulas are obtained for calculating the power parameters of the process. Minimizing the function received makes it possible to determine the optimal value of the back rake angle of the cutting tool in different cutting modes. Seven illustrations, 12 bibliographic entries.

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UDC 621.791.14:669.715+669.14

USSR

POLUKHIN, P. I., Doctor of Technical Sciences, MUKHIN, S. V., Engineer  
(Moscow Institute of Steels and Alloys), and MASTEROV, V. A., Candidate  
of Technical Sciences (All-Union Correspondence Polytechnical Institute)

"Press Welding of Steel-Aluminum Adapters"

Moscow, Svarochnoye Proizvodstvo, No 10, Oct 70, pp 19-20

Abstract: A study was made of the possibility of direct press welding of tubular parts of Kh18N10T steel and AMg6 aluminum alloy to produce adapters with wall thicknesses of 6-8 mm, to withstand heating of 450-480°C and cooling in liquid nitrogen. Study of the flow of the metal and welding during joint deformation of the steel and aluminum showed that the principal parameters of welding are the increase in the end area during upsetting of the steel or alloy, the relative overhang of the steel or alloy, and the force of the press. With constant wall thickness of the adapter, these parameters are independent of diameter, since the metal flows only in the radial direction. The properties and structures of a butt joint and bimetallic sheet are similar. Circular adapters retain vacuum tightness and strength in liquid nitrogen after welding of their ends to steel and AMg6 alloy.

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POLUKHIN, V.A.

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JPRS 59

9 August 1973

SO: JPRS 59151  
9 Aug 73

All satellite  
communications

UDC 621.396.946

THE NEW "ORBITA-2" SATELLITE COMMUNICATIONS STATIONS

Article by L. Ya. Kantor, V. A. Polukhin, and N. V. Talyzin; Moscow, Elektronika, Russian, No. 5, 1973, signed to press 3 January 1973, pp 1-87

The Directives of the 23d Congress of the CPSU (Communist Party of the Soviet Union) provided for the transmission of programs from Central Television via artificial satellites of the Earth to distant regions of our country. This task was solved in 1967 on the eve of the 50th anniversary of the Great October Socialist Revolution, when 20 "Orbita" stations were placed in operation, i.e., a network of ground stations receiving the program from Central Television via "Molnya-1" communications satellites was created [1]. At the present time the number of "Orbita" stations has doubled. The majority of the "Orbita" stations have obtained the capability of receiving color television programs.

In certain cases the "Orbita" stations have become the source of one more Central Television program, in addition to the program obtained by cable and radio-relay communications lines. In these years, rich experience in the operation of new communications systems has been accumulated in the network "Orbita" stations, and a large number of technical problems have been worked out [2].

The Directives of the 24th Congress of the CPSU with respect to the five-year plan for the development of the national economy of the USSR for 1971-1975 provides for the performance of scientific work in space for purposes of the development of long-range telephone-telegraph communications and television. In carrying out these directives, in 1972 by the fifth anniversary of the formation of the Union of Soviet Socialist Republics, the development of a set of equipment for the new satellite communications stations, which have been named "Orbita-2", has been completed.

In September 1972 the first "Orbita-2" technological station was placed in operation at the city of Arhangelsk; on the eve of the 55th anniversary of

USSR

UDC: 621.771.23

POLUKHIN, V. P., and POTEMKIN, V. K., Moscow Institute of Steel and Alloys

"Effect of Cold Processing on the Structure and Mechanical Characteristics of Hot-Rolled Sheet"

Moscow, Izvestiya VUZ--Chernaya Metallurgiya, No. 8, 1971, pp 101-105

Abstract: An explanation is given of the effect of cold rolling, after roasting and dressing, on the grain size and mechanical characteristics of 08 oxygen potential, low-carbon steel obtained from hot rolling. It is asserted that although a good deal of work has been done on the structure and mechanical qualities of steel in hot and cold rolling, little has been done on the change in characteristics of hot-rolled sheet steel after cold processing. Three hot-rolled sheets rolled to a thickness of 2.8 mm under different temperature conditions and with radically differing structure and characteristics but similar chemical compositions were used in the experiments. A detailed description, together with a table, of the processing through which these specimens were put, is presented. Photomicrographs of specimen structure at various stages of the processing are reproduced. The authors find that cold rolling leads to a reduction in the grain by 1-0.5 points in the middle

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UDC: 621.771.23

POLUKHIN, V. P., et al, Izvestiya VUZ--Chernaya Metallurgiya, No. 8, 1971, pp 101-105

of the specimens but does not affect the structure at the edges. Evening of the structure along the length of the sheet and some increase in plasticity over the hot-rolling procedure were also observed.

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USSR

UDC 621.771

POLUKHIN, V. P., YEFIMENKO, S. P., NIKOLAYEV, V. A., POLUKHIN, P. I., SOLOGUB, V. L., and DUNAYEVSKIY, V. I.

"On the Question of Optimal Conditions for Operating the Rolls of Cold Rolling Mills"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya" Publishing House, No 64, 1970, pp 53-63

Translation: The article gives recommendations for situating the rolls on the stands, evaluates the degree of built-up metal danger, and offers steps to restore working rolls damaged during the operating process. A new generalized criterion of hardness is proposed which makes it possible to evaluate conditions of roll manufacture and causes of service failures in them. Four illustrations and two tables.

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USSR

UDC 621.771.016

POLUKHIN, V. P., POLUKHIN, P. I., KHLOPONIN, V. N., and PODYMOV, V. F.

"An Analysis of Conditions during Cold Rolling of Low-Carbon Steel"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya" Publishing House, No 64, 1970, pp 29-33

Translation: Using a mathematical model of the sheet rolling process on a Minsk-22 computer, investigations were carried out of the power parameters of cold rolling low-carbon 08kp steel. A nomogram was obtained which describes the effective area of rolling under the given conditions. The substantial influence of elastic compression of the rolls on the rigidity of the rolling stand is demonstrated. Results from the study are compared with results which describe cold rolling of stainless steel. Two illustrations and five bibliographic entries.

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USSR

UDC 621.771.01.016

POLUKHIN, V. P., and KHLOPONIN, V. N.

"Effect of Cold Rolling Parameters on the Neutral Angle and Lead"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya"  
Publishing House, No 64, 1970, pp 33-36

Translation: The effect of the initial strip thickness, friction in the center of deformation, elastic compression of the rolls, and the zone of complicated strain on the position of the neutral section during cold rolling of stainless steel is considered. The investigation was made using a mathematical model of the sheet rolling process, realized on a Minsk-22 computer.

The relative value of the neutral angle (relationship to the angle of contact) during cold rolling of thin sheet does not depend on the initial thickness of the strip being rolled. Elastic compression of the rolls leads to shift in the neutral section toward the exit from the rolls. Decreasing the friction ratio also causes the neutral section to shift in this direction. In this, due to elastic compression of the rolls, where the angle of contact is greater than the angle of repose the established rolling process is carried on, and where the angle of contact exceeds the doubled angle of repose the process of full slippage appears. Five illustrations and six bibliographic entries.

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USSR

UDC 621.771.01.016

POLUKHIN, V. P., and KHLOPONIN, V. N.

"The Effect of Tension on the Position of the Neutral Section During Cold Rolling of Stainless Steel"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya" Publishing House, No 64, 1970, pp 37-40

Translation: An analysis is made of the effect of even, consistent specific tension and even, consistent full tension on the position of the neutral section. It is shown that as even, consistent specific tension increases the position of the neutral section shifts toward the exit from the rolls, while remaining constant with changes in even, full consistent tensions. The results agree with the conclusions of Yu. M. Faynberg. But, due to an arbitrary assumption of the even distribution of specific pressure over the contact surface, Yu. M. Faynberg's formula only permits one to correctly evaluate the qualitative dependency of the neutral angle on tension. The research was conducted using a mathematical model of the sheet rolling process, performed on the Minsk-22 computer. Three illustrations, eight bibliographic entries.

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USSR

UDC 621.771.019.53.072

POLUKHIN, V. P., LUR'YEV, V. V., and ALESHIN, A. P.

"Modelling Uninstalled Rolling Processes on an Analog Computer"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya"  
Publishing House, No 64, 1970, pp 19-23

Translation: An electronic model designed to investigate the dynamics of the rolling process is described.

The modelling was done on an EMU-10 analog computer.

The equations of the "1" stand are given in increments. A block diagram of the model is given, and a model oscillogram is shown. Two illustrations, one table, and five bibliographic entries.

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USSR

UDC: 621.771.23

~~POLUKHIN, V. P.~~, VISHNYAKOV, YA. D., POTEKIN, V. K., and CHUVILEK, V. P.,  
Moscow Institute of Steels and Alloys

"Effect of the Temperature Conditions of Hot Rolling on Both Structure and Mechanical Properties of 08 kp Steel"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya,  
№ 1, 1971, pp 82-85

Abstract: This study concerns the causes of quality impairments of thin hot-rolled strip up to 3 mm in thickness designed to be cold converted to 0.8-0.6 mm. The study involved the effect of temperature conditions of hot rolling on the structure and mechanical properties of 08 kp steel strip rolled for 2.8 mm under four sets of temperature conditions. Investigation of the strip along its length and width has found the central sections to have lower characteristics than those at the edges. The data given here are therefore referred to the middle sections along the width.

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USSR

POLUKHIN, V. P., et al, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 1, 1971, pp 82-85

Figures in the original article show changes in the grain size, the strength properties, and plasticity along the length of the strip. It has been demonstrated that the optimum structure and mechanical properties-to-plasticity ratio are attained at 880°C at the end of rolling and 610°C for coiling.

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USSR

UDC 621.771.23.001.5

POLUKHIN, V. P., ZAUGOL'NIKOV, D. N., and POLYASHOV, V. S.

"A Method for Comprehensive Study of Cold Rolling Parameters on a Continuous, Four-Stand 1,700 Mill With Established and Transient Processes"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 266-271

Translation: The article considers questions of the precision of measuring speed parameters of continuous rolling. It is only possible to measure the speed of a strip on tensometric rollers with established processes. Decreasing the flywheel mass of the roller which contacts the strip increases the precision of measurements and makes them possible with unsettled processes. An evaluation of the precision of measurements was made by comparing the amount of lead received by the graduation line method and the value received from the relationship of strip speed and the rolls. The monitor of roll revolutions (speed) must be installed directly on the roll neck; if the monitor is installed on the spindle and shaft of the tachogenerator, the error of measurement grows. In determining the other rolling parameters, measuring devices permanently installed on the mill were used. Five figures and two bibliographic entries.

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USSR

UDC 621.771.23.001.5

TITLYANOV, A. Ye., POLUKHIN, V. P., BOGDANOVA, G. P., and SAVINKINA, A. I.

"Optimizing Reduction States of the Dressing Process Considering the Effect of Straightening on the Mechanical Properties of a Thin Sheet"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya" Publishing House, No. 64, 1970, pp 97-103

Translation: It is shown that, at low reductions in the process of dressing O8kp steel, subsequent straightening lowers the value of a majority of mechanical properties and the depth of the hole when testing according to Eriksen. Taking into account the effect of straightening on mechanical properties of the dressed metal makes it possible to select the optimal dressing mode more correctly. Reduction during dressing in the range of 0.5-0.7 percent with subsequent straightening makes it possible to eliminate the area of yield on the tension diagram and to obtain metal with a minimum yield point, lowered hardness, and a very deep Eriksen hole, which increases the stampability of sheet metal. Six illustrations and seven bibliographic entries.

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USSR

UDC 621.771.23.001.5

TRILYANOV, A. Ye., POLUKHIN, V. P., BOGDANOVA, G. P., and SAVINKINA, A. I.

"The Effect of Speed on Change in the Technological Parameters of the Dressing Process"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya" Publishing House, No. 64, 1970, pp 91-97.

Translation: Investigation on the four-high 1700 mill showed that, with O8kp steel 0.5-2.0 mm thick, increasing the speed of dressing leads to an increase in reduction and metal pressure on the rolls. It is shown that increasing these quantities does not depend on preliminary adjustment and is established by the mechanical properties, thickness of the sheet, rigidity of the stand, and design of the liquid friction bearings. The results make it possible to determine the amount of preliminary adjustment established at low speeds, which corresponds to the optimal reduction state at working speed. Six illustrations, 13 bibliographic entries.

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USSR

UDC 621.771.063

POLUKHIN, V. P., LUR'YEV, V. V. and ALESHIN, A. P.

"An Electronic Model for Investigating Installed Continuous Rolling Processes"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya"  
Publishing House, No 64, 1970, pp 15-19

Translation: An electronic model of a four-stand continuous cold rolling mill is created on the basis of the method of joining individual stands by tension.

MN-7 analog computers were used during the modelling. A schematic diagram of the model is given, and a sample calculation is made. Three illustrations and five bibliographic entries.

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USSR

UDC 621.771.073.001.5

KOSARIMOV, Ye. N., POLUKHIN, V. P., ZINOV'YEV, A. V., and GOLUECHIKOV, V. A.

"Calculating the Camber of the Backup Roll Taking Into Account the Unevenness of the Curve of Inter-Roll Pressure"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya" Publishing House, No. 64, 1970, pp 122-124

Translation: A method is proposed for calculating the camber of the backup roll of a four-high mill, taking into account the uneven distribution of inter-roll pressure over the length of the roll barrels. It is shown that, in the actual range of unevenness of inter-roll pressure, bending deflection may vary by 20 percent at the same pressure on the housing screws.

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USSR

UDC 621.771.073.001.5

NIKOLAYEV, V. A., ZAUGOL'NIKOV, D. N., and POLUKHIN, V. P.

"Stress Condition in the Contact Zones of Working Rolls in Passing a Weld Joint"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 225-232

Translation: A method is proposed for calculating the optimal shape of a weld joint which compensates for the increased yield point at this place. In order to check the calculations, the polarization-optical method was used. It confirmed the correctness of this technique for determining the optimal shape of the weld. Three figures and one table.

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USSR

UDC 621.771.073.001.5

POLUKHIN, P. I., NIKOLAYEV, V. A., POLUKHIN, V. P., TERESHKO, A. K., and  
YEFIMENKO, S. P.

"An Analysis of Operating Stresses in the Contact Zones of Four-High Rolling  
Mill Rolls"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya"  
Publishing House, No 64, 1970, pp 68-72

Translation: Data are given on the size and nature of the distribution of  
residual stresses in rolls 500 mm in diameter. Summary operating stresses  
in the rolling process are analyzed in dependence on the technological  
features: tension; ratio of internal friction; slippage. Four illustrations,  
three bibliographic entries.

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USSR

UDC 621.777.073.001.5

NIKOLAYEV, V. A., POLUKHIN, V. P., and YEFIMENKO, S. P..

"Stress Condition in the Contact Zones of Working Rolls in Rolling a Fold"

Plasticheskaya Deformatsiya Metallov i Spilavov, Moscow, No. 64, "Metallurgiya,"  
1970, pp 217-225

Translation: A study is made of the causes of breaks in strips during rolling, and, in connection with this, the dynamic of stress condition during fold rolling due to the strip bending in two or three with the loss of tension. A calculation is made of the stress condition, and experimental data are given using optical modeling. Six figures, two tables, and two bibliographic entries.

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USSR

UDC: 621.9.658.5

BUDEKOV, B. A., POLUKHIN, V. P. and AVERBUKH, I. I.

"Using Ultrasound to Automatically Control Strip Thickness"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya,"  
1970, pp 271-274

Translation: A description is given of the diagrams and operating principle of an electromagnetic acoustic transformer and contactless resonance thickness measurer which makes it possible to control the thickness of strip with a precision up to 1.5 percent at a rolling speed of 20 meters per second and ensures locality of measurement within several centimeters. Four figures.

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USSR

UDC: 621.317.757

POLUKHIN, Yu. N., KITAYTSEV, A. A.

"Spectral Analysis of Microwave Pulses by a Ferrite Converter"

Kiev, IVUZ Radioelektronika, Vol 15, No 5, May 72, pp 597-605

Abstract: A ferrite converter consisting of a ferrite specimen surrounded by a coil connected in a tank circuit is considered for use in spectral analysis of short microwave pulses. It is shown that with appropriate selection of the parameters of the ferrite specimen and tank circuit, the voltage across the converter output reproduces the energy spectrum of the microwave signal acting on the ferrite when the ferrite is tuned. A block diagram and parameters are presented for a pilot model of a spectrum analyzer.

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USSR

UDC: 621.374

POLUKHIN, Yu. N.

"Oscillations in the Magnetization of Ferrite in a Microwave Pulse Field"

Tr. Kuybyshev. aviats. in-t (Works of the Kuybyshev Aviation Institute), 1970, vyp. 44, pp 114-125 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5G250)

Translation: A solution is found for the equation of motion of the vector of magnetization when ferrite is subjected to a microwave pulse field with arbitrary envelope shape and arbitrary angular modulation of the carrier signal. The problem involves the theory of microwave ferrite devices working in the pulse mode. Bibliography of six titles. N. S.

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Acc. Nr.: AP 0046489

Ref. Code: UR0115

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USSR

UEC 621.317.742.001.1

POLJLYAKH, K., S.

"Phase Generator-Converter Theory"

Moscow, Izmeritel'naya Tekhnika (Measurement Technology), No 1, 1970, pp 54-56

Translation: High-sensitivity phase converter theory was discussed. Analytical methods were used to derive equations of the operating frequency of generator voltage and of converter sensitivity for various coupling networks. (1 table, 6 figures, 6 biblio. ref.)

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USSR

UDC 547.785.5+541.49+288.4

KOGAN, V. A., OSIPOV, O. A., CHUB, N. K., GARNOVSKIY, A. D., BURLOV, A. S.,  
TSUPAK, Ye. B., and POLUNIN, A. A., Rostov-na-Donu State University

"Complex Compounds of Copper With Heterocyclic Aldoximes"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), No 3, Mar 72, pp 581-584

**Abstract:** A series of new polynuclear compounds of copper with heterocyclic aldoximes synthesized from benzimidazole were produced for the first time. Ultimate analysis and magnetochemical measurements are used to determine the composition of the compounds and the presence of an exchange interaction with perchlorate anions. Differences in the composition and properties of the complexes are determined as they are related to the nature of the anion. The IR spectra of the compounds are studied and a hypothesis is proposed for the point of coordination of the ligand with copper.

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USSR

POLUNIN, P. M.

"Erythrocyte Lipoprotein Complexes in the Normal and Pathological State"

Tr. Mosk. vet. akad. (Works of Moscow Veterinary Academy), 1970, 54, pp 52-56  
(English summary) (from RZh-Biologicheskaya Khimiya, No 2, 25 Jan 71, Abstract  
No 2F1331 from summary)

Translation: In radiation sickness induced by feeding Sr<sup>90</sup> the total content of cholesterol-stromatin and phosphatide-stromatin complexes decreases by virtue of the decline in unstably bound forms. The lipohemoglobin complex does not vary quantitatively, but the structure of the complex varies: the quantity of unstably bound phosphatides decreases, while the degree of unstably bound cholesterol increases. Development of the radiation process is accompanied by an increase in the stability of the cholesterol-stromatin complex (by 45%) and by a weakening of the bonds in the cholesterol-hemoglobin complex (by 15%)

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USSR

UDC 534.22-14

MIKHAYLOV, I. G., POLUNIN, V. M., Leningrad State University

"Ultrasonic Velocity in Certain Liquids as a Function of Various Parameters of State"

Moscow, Akusticheskiy Zhurnal, Vol XVIII, No 1, 1972, pp 68-73

Abstract: Results are presented from measuring ultrasonic velocity as a function of various physical conditions ( $p = \text{const}$ ,  $t = \text{const}$ ,  $\rho = \text{const}$ ) in three liquids: GOST 682454 glycerine (containing 0.02% water with a melting point  $t_{\text{melt}} = -25^\circ$ ) and the polymethylsiloxanes PMS-400 (mean molecular weight 9,500,  $t_{\text{melt}} = -60^\circ$ ) and PMS-5 mean molecular weight 640,  $t_{\text{melt}} = -60^\circ$ ). The shear viscosity and density of these liquids as functions of the temperature and pressure are also presented. On the basis of the hole model theory, these data were used to calculate the speed of sound in these liquids and its dependence on the temperature and pressure. The experimental data and calculated results exhibit satisfactory qualitative agreement.

The measurements show that when the initial pressure exceeds ~10 technical atmospheres, the function  $c(t)$  has an approximately negative nature where  $dc/dt > 0$ . Hole theory gives a qualitatively correct analytical expression for the speed of sound suitable for describing such liquids as PMS-400, PMS-5

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USSR

MIKHAYLOV, I. G., et al., Akusticheskiy Zhurnal, Vol XVIII, No 1, 1972, pp 68-73

and glycerine. The behavior of glycerine is described worse than the behavior of the other two liquids as a result of the specific nature of the structure of strongly polar tightly packed liquids not considered by hole theory. The calculations also indicate the suitability of Boltzman distribution for estimating the number of holes in these liquids.

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USSR

UDC 534.22

MIKHAYLOV, I. G., POLUNIN, V. M., and SOLOV'YEV, V. A., Leningrad State University

"Velocity and Absorption of Ultrasonic Waves in Several Viscous Liquids at Pressures up to 1000 atm"

Moscow, Akusticheskiy Zhurnal, Vol 27, vyp 1, 71, pp 103-109

Abstract: This article discusses the results of measuring the velocity and coefficient of absorption of ultrasound in several viscous liquids as a function of pressure (1-1000 atm) and temperature (8-50°).

The various devices used for the acoustic measurements are described and depicted graphically in six figures and two tables.

Figure 1 is a block-schematic of the device used to measure the velocity and coefficient of absorption of ultrasound in liquids under pressure. The acoustic cell is shown in Figure 2, and the relative change in sound velocity is shown graphically in Figure 3 as a function of pressure at 20°; Table 1 gives the results of measuring the sound velocity as a function of pressure and temperature.

Figure 4 is a graphic representation of the coefficient of absorption of ultrasound as a function of pressure, measured at a frequency of 4 MHz at 1/2

USSR

MIKHAYLOV, I. G., et al., Akusticheskiy Zhurnal, Vol 27, vyp 1, 71, pp 103-109

20°, and of the classical coefficient of absorption computed under these conditions from the Stokes formula. From this figure it is clear that the coefficient of absorption measured at atmospheric pressure is approximately eight times smaller than the Stokes value. Table 2 (and Table 1 also) gives the physical parameters of the liquid measured for various hydrostatic pressures.

Figure 5 shows the curve of the frequency function given for 20° and at atmospheric pressure, indicating that the relaxation time depends identically on pressure and temperature.

Figure 6 shows the relative change in relaxation time as a function of pressure in several liquids; the figure indicates that the relaxation time grows in certain liquids with increase in pressure, whereas in others it diminishes or remains constant. An increase in relaxation time, with the application of pressure, apparently is characteristic only of structural relaxation and thus may be used as an indication thereof.

This article cites 12 literature references; included also are 6 figures, 3 equations, and 2 tables.

2/2

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USSR

UDC: 534.286

MIKHAYLOV, I. G., POLUNIN, V. M., Leningrad State University

"Concerning the Question of Structural Relaxation in Liquids"

Moscow, Akusticheskiy Zhurnal, Vol 18, No 2, Apr-Jun 72, pp 286-291

Abstract: Dilatational and shear viscosity are studied as a function of pressure in glycerin containing 0.02% water. Ultrasonic absorption was measured on a frequency of 4 MHz at 30°C in the 1-1000 atmosphere pressure range (in 250 atmosphere intervals). It was found that the dilatational-to-shear viscosity ratio  $\eta_v/\eta_s$  is close to unity (as is typical of liquids with a structural relaxation mechanism) and shows a slight reduction with increasing pressure (from 1.24 to 1.16 over the entire measurement range). A simple structural model is proposed for liquids of this type to explain the experimental results. The liquid is assumed to be a viscous, slightly compressible medium containing small spherical cavities with relatively high compressibility. Calculations show that such a hypothetical fluid should have a dilatational viscosity approximately equal to its shear viscosity and that the relaxation times for these viscosities should coincide.

1/1

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I/2 016 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--RESULTS OF BENCH AND INDUSTRIAL TESTING OF NEW TYPES OF COATING  
RUBBERS FOR CONVEYER BELTS -U-  
AUTHOR--(04)--GORBACHEV, B.G., POLUNIN, V.T., GULENKO, G.N., FROLOV, V.I.  
COUNTRY OF INFO--USSR  
SOURCE--KAUCH. REZINA 1970, 29(3), 44-5  
DATE PUBLISHED--70



SUBJECT AREAS--MATERIALS, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--ELASTOMER, MINING MACHINERY, ABRASIVE RESISTANCE, RADIOACTIVE  
TRACER, THALLIUM ISOTOPE, SYNTHETIC RUBBER, TEST METHOD  
POLYISOPRENE/(U)SKD SYNTHETIC RUBBER, (U)SK13 ISOPRENE RUBBER, (U)8SK  
SYNTHETIC RUBBER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/0834

STEP NO--UR/0138/70/029/003/0044/0045

CIRC ACCESSION NO--AP0124501

UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124501

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SEVERAL BRANDS OF ELASTOMER LININGS FOR CONVEYER BELTS (USED IN THE MINING INDUSTRY) WERE TESTED FOR ABRASIVE WEAR BY A RADIOACTIVE METHOD USING PRIME204 TL AS A POINT TRACER. THE EXPTL. PROCEDURE WAS DESCRIBED. BENCH AND INDUSTRIAL TESTS INDICATED THAT BSK PLUS SKD AND SKI 3 PLUS SKD ELASTOMERS HAD THE LOWEST ABRASIVE WEAR.

FACILITY: MOSK. GORN. INST., MOSCOW, USSR.

UNCLASSIFIED



UDC 546.791.666

USSR

P

KOVBA, L. M., POLUNINA, G. P. and KHRIMOVA, M. M.

"Toward the Study of Dual Oxides of Erbium and Uranium"

Leningrad, Radiokhimiya, Vol XI, No. 5, pp 601 - 603

Abstract: Data are insufficient on the variation of the degree of oxidation of uranium during interaction of its lower and higher oxides with  $Er_2O_3$ ,

since various studies have revealed the presence of compounds of type

$R_6UO_{12}$ , among others, within  $R_2O_3-UO_2-O_2$  systems. The present study was

undertaken to elucidate the phase relationships of the  $U_3O_8-Er_2O_3-O_2$  system.

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USSR

KOVBA, L. M., et al., Leningrad, Radiokhimiya, Vol XI, No 5, pp 601-603

Ammonium uranate and erbium hydroxide were precipitated jointly from nitric acid solution, and after heating the degree of oxidation of the uranium was determined vanadatometrically and coulometrically. Roentgen-phase analysis was made.

Complete data from the phase and chemical analyses are included in the paper.

2/2

USSR

UDC: 621.374.33(088.8)

VOLOSHIN, L. A., POLUNINA, T. M.

"An Electronic Key"

USSR Author's Certificate No 273277, filed 13 Jan 69, published 28 Aug 70  
(from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2G294 P)

Translation: A switch is proposed which consists of an amplification stage, a transformer and a controlling balanced input circuit. To reduce commutation noise level and simplify conditions for balancing the control pulse, one of the transformer windings is connected in the emitter circuit of the amplification stage, and the collectors of the controlling transistors are connected to the other winding without feeding the supply voltage to these collectors. The emitters of the controlling transistors are interconnected and grounded, and the bases are interconnected through a potentiometer to which the controlling pulses are sent.

1/1

1/2 017 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--PHOTOELECTRIC DEVICE FOR CENTRAL POSITIONING OF HOLES -U-

AUTHOR--POLUNOV, YU.L.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 238796

REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI NO 10

DATE PUBLISHED--29JUL70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, METHODS AND EQUIPMENT

TOPIC TAGS--PATENT, PHOTUELECTRIC PROPERTY, POSITION FINDING, MECHANICAL ENGINEERING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1994/0839

STEP NO--UR/0482/69/000/000/0000/0000

CIRC ACCESSION NO--AA0114933

UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AA0114933

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN OBJECT 2 IS POSITIONED ON A MICROMETER TABLE 1. LIGHT FROM A SOURCE 3 AND CONDENSER 4 PASSES THROUGH THE HOLE OF AN OBJECT AND WITH AN OBJECTIVE 5 FORMS THE IMAGE OF THIS HOLE IN THE PLANE OF A PHOTOELECTRIC RESISTOR 12, WHICH FORMS THE ARMATURE OF A SCANNING UNIT 6. THIS UNIT IS FORMED BY FOUR ELECTRO MAGNETS POSITIONED AT 90DEGREES ONE WITH RESPECT TO THE OTHER AND FED WITH CURRENTS ALSO DISPLACED IN PHASE BY 90DEGREES. THIS ENABLES TO IMPART AN ELLIPTICAL MOTION TO THE ARMATURE 11. THE ELECTRONIC CIRCUIT ANALYSES THE OUTPUT OF THE RESISTOR 12 AND THE SCANNING SIGNAL, AND AN INSTRUMENT 17 INDICATES ZERO READING WHEN THE CIRCULAR IMAGE OF THE HOLE COINCIDES WITH THE CENTRE OF THE SCANNING ELLIPSE. FACILITY: MOSKOVSKIY STANKOINSTRUMENTAL'NYY INSTITUT.

UNCLASSIFIED

USSR

UDC 616.005.1-085.468

SHRAGO, H. I., SHINKARENKO, A. A., GONCHAROVA, L. S., RYBUS, M. YA., and POLUPAN, V. N., Khar'kov Scientific Research Institute of General and Emergency Surgery, Khar'kov

"Local Hemostatics Based on Oxidized Cellulose"

Leningrad, Vestnik Khirurgii imeni I. I. Grekova, Vol 106, No 5, May 71, pp 61-64

Abstract: Hemostatics prepared on the basis of oxidized cellulose by methods developed by workers at the Khar'kov Chemico pharmaceutical Institute (B. G. Yasnitskiy, Ye. B. Dol'berg, V. A. Gridoroga, A. A. Shalimov, V. N. Polupan, A. A. Shinkarenko, and H. I. Shrigo) were subjected since 1965 to experimental and clinical tests at the Khar'kov Scientific Research Institute of General and Emergency Surgery. After experimental tests on animals, the hemostatics were applied clinically at the Institute of General and Emergency Surgery under the direction of Prof. A. A. Shalimov, Corresponding Member of the Academy of Sciences Ukrainian SSR, Director of the Institute. Hemostatic gauze, hemostatic viscose fabric, and the hemostatic composition Oxycelodex (hemostatic gauze powder + 20% of a dextran solution with a mol. wt. of 45,000-70,000) were applied successfully on patients. The gauze and viscose fabric were used to stop the blood flow from small blood vessels after major

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JSR

SHRAGO, H. I., et al., Vestnik Khirurgii imeni I. I. Grekova, Vol 106, No 5, May 71, pp 61-64

operations. An advantage of these hemostatics was that they did not have to be removed from the wound, because they were resorbed. Oxycellodex was injected with a syringe to fill the channels left after transcutaneous puncture biopsy of the liver of splenic portography. The hemostatic gauze is being produced at the experimental plant of the Khar'kov Chenico pharmaceutical Institute. Preparations for the production of the hemostatic viscose fabric at this plant have been made.

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USSR

UDC:620.197.5

BATRAKOV, V. P. and POLUPANOV, V. L.

"Determination of the Protective Potential with Cathodic Protection of Polymetallic Structures in Seawater"

Moscow, Zashchita Metallov, Vol 10, No 1, Jan-Feb 74, pp 63-65

Abstract: Up to the present time, there has been no single method for determination of the protective mode for steel structures or aluminum alloy structures. The authors suggest a universal method for determination of the optimal value of protective potential for polymetallic structures, based on a diagram of the set of partial anodic curves, based in turn on determination of the area of the general passive state.

1/1



P  
USSR

UDC: 621.372.85(088.8)

POLUPANOV, V. N., Institute of Radio Physics and Electronics, Academy of Sciences  
of the Ukrainian SSR

"A Device for Frequency Displacement"

USSR Author's Certificate No 251033, filed 19 Jun 67, published 11 Feb 70 (from  
RZh-Radiotekhnika, No 7, Jul 70, Abstract No 7B185 P)

Translation: The device consists of two series-connected ferrite modulators of the polarization plane. In order to suppress undesirable components of the output spectrum, a differential phase section with a  $\lambda$ -wave dielectric plate is located between the modulators, and polarization filters with an absorbing plate are connected at the input and output of the device. One illustration. Resumé.

1/1

USSR

UDC: 681.3.06:51

TARAKANOV, K. V., POLURENKO, N. P.

"General Structure of Formation of the Right-Hand Members of a Certain Class of Systems of Differential Equations With the Aid of a Digital Computer"

V sb. Tsifr. vychisl. tekhnika i programir. (Digital Computer Technology and Programming--collection of works), vyp. 6, Moscow, "Sov. radio", 1971, pp 61-68 (from RZh-Kibernetika, No 7, Jul 71, Abstract No 7V728)

Translation: A method is outlined for programmed formation of the right members of systems of Markovian differential equations according to mnemonic rules. The differential equations describe functioning of certain complex systems. Formation of the right members of the equations is a prerequisite for computer sorting of all possible states of the complex system. As a result of sorting of the states of the complex system, information is obtained which uniquely defines the right-hand members of the differential equations. The principle of positional storage of information with a variable step is used, which together with the principle of computer compilation of right-hand members ensures integration of a comparatively large number of differential equations. Authors' abstract.

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Hematology

UDC 615.381.011.3:532.13 3

USSR

KAVESHNIKOV, A. I., SETT, A. V., URATKOV, Ye. F., ORLOV, Ye. S.,  
STRUCHKOVA, K. I., POLUSHINA, T. V., and SUSOVA, G. M.,  
Department of Experimental Traumatology and Orthopedics, Central  
Institute of Traumatology and Orthopedics, Ministry of Health  
USSR, and Laboratory of Blood Substitutes and Fractionation of  
Blood Proteins, Central Institute of Hematology and Blood  
Transfusion, Moscow

"Changes in the Viscosity of Blood After Dilution with Different  
Blood Substitutes Under Hypothermia Conditions"

Moscow, Patologicheskaya Fiziologiya i Eksperimental'naya  
Terapiya, No 1, 1971, pp 70-75

Abstract: Changes in the viscosity of blood were studied after  
dilution at different temperatures with the following solutions:  
Ringer Locke, glucose, polyglucine [form of dextran],  
rheopolyglucine, low-molecular weight dextran, and polyvinyl-  
pyrrolidone. The tabulated results can be used as a basis for  
selecting a blood substitute and degree of blood dilution in  
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USSR

KAVESHNIKOV, A. I., et al., Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No 1, 1971, pp 70-75

relation to perfusion temperature. A mathematical formula is proposed for calculating the viscosity of the solution in blood dilution in relation to the hematocrit index, temperature and viscosity of the blood substitute. It is concluded that in case of normothermal perfusion or slight chilling, any of the solutions studied can be used. But under low-temperature conditions, when water moves from the interstitial and intracellular spaces, it is preferable to use rheopolyglucine, low-molecular-weight dextran, or low-molecular-weight polyvinylpyrrolidone because they decrease the viscosity of the perfusate more than the others.

2/2

1/2 024 UNCLASSIFIED PROCESSING DATE--18SEP70  
TITLE--EXPERIMENTAL STUDIES OF TOXIC PROPERTIES OF THE SERUM FROM PATIENTS  
WITH HEMORRHAGIC VASCULITES OF THE SKIN -U-  
AUTHOR--(02)--KULAGA, V.V., POLUSHKIN, B.V.

COUNTRY OF INFO--USSR

SOURCE--VESTNIK DERMATOLOGII I VENEROLOGII, 1970, NR 3, PP 20-24.

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--HEMORRHAGE, ALLERGIC DISEASE, SKIN DISEASE, GUINEA PIG,  
SEROTONIN, HEPARIN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1985/1490

STEP NO--UR/0206/70/000/003/0020/0024

CIRC ACCESSION NO--AP0101574

UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0101574

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS STUDIED HEMORRHAGIC PROPERTIES OF THE SERUM FROM 52 PATIENTS SUFFERING FROM DIFFERENT FORMS OF VASCULITES OF THE SKIN (ALLERGIC VASCULITES OF THE ACUTE COURSE IN 30, DERMATIC FORM OF NODULAR PERIARTHERIITIS AND CHRONIC ERYTHEMA NODOSUM IN 10, CHRONIC CAPILLARITES IN 12 PATIENTS). THE METHOD OF BERNARD ET AL. CONSISTED IN THE INOCULATION OF TWO GUINEA PIGS IN THE RIGHT SIDE INTRACUTANEOUSLY WITH 0.2 ML OF A SERUM SPECIMEN FROM A PATIENT. THE CONTROL SERUM WAS INOCULATED INTO THE SYMMETRICAL AREA. SERA FROM PATIENTS WITH ALLERGIC VASCULITES OF THE SKIN IN THE ACUTE FORM PRODUCED IN 81PERCENT OF CASES AN INFLAMMATORY HEMORRHAGIC REACTION ENDING WITH NECROSIS IN THE SKIN OF THE ANIMALS. LESS FREQUENT (50PERCENT) AND LESS INTENSIVE REACTIONS WERE OBTAINED WITH SERA FROM PATIENTS WITH CHRONIC CAPILLARITES. SERA FROM HEALTHY SUBJECTS AND PATIENTS WITH GONORRHEA PRODUCED A POORLY POSITIVE REACTION IN 20PERCENT. THE HEMORRHAGIC INACTOR OF THE SERUM IS THERMOLABILE AND IS INACTIVATED AT 56PERCENT C FOR ONE HOUR. ITS EFFECT IS NOT INHIBITED BY CYPROHEPTADINE AND SEROTONINE. HEPARIN AND BRADIKININ ENHANCE THE PHENOMENON SIGNIFICANTLY.

UNCLASSIFIED

USSR

UDC: 621.396.9:527.629.78

CHEBOTAREV, R. P., SIDORIN, V. N., ~~POLUSHKIN, G. A.~~, BIPARSOV, R. Sh.,  
ISAMUTDINOV, Sh. O., KOLMAKOV, V. M.

"A Set of Equipment for Radar Studies of Meteors in Dushanbe"

Byul. In-ta astrofiz. AN Tadzh. SSR (Bulletin of the Institute of Astro-  
physics of the Academy of Sciences of Tadzhik SSR), 1970, No 55, pp 24-28  
(from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12G94)

Translation: The authors describe a set of equipment for measuring the wind  
in the upper atmosphere in the IQSY program at the Institute of Astrophysics  
of the Academy of Sciences of the Tadzhik SSR. The equipment is designed  
for determining coordinates, altitudes, radiants and velocities of meteors,  
and for studying the physics of meteors and of the upper atmosphere. Data  
are given in brief for operation of the equipment complex. Resumé.

1/1

Magnetohydrodynamics

UDC 533.915+535.343.1

USSR

MORGULIS, N. D., POLUSHKIN, I. N., KRAVCHENKO, A. I.

"Spectral Emission and Population of Cesium Levels in a Short Plasma Diode. I"  
Kiev, Ukrainskiy Fizicheskiy Zhurnal, Vol 16, No 2, February 1971, pp 335-338

Abstract: In this report some preliminary data are presented from a spectral study of nonequilibrium processes in a short cesium plasma diode. The emission of some spectral lines of the diffuse and main cesium series in a short (5 mm) plasma discharge diode with an incandescent cathode was investigated. Measurements were taken at various (low) cesium vapor pressures, different current densities and voltages on the diode, and at different distances from the cathode  $x$ . The populations of the various D-, 7P-, and 8P-levels were determined on the basis of the data obtained, taking into account reabsorption of emission. Simultaneously, the characteristics of the investigated plasma were also determined for various values of  $x$  using a sliding cylindrical probe. The experimental results demonstrated that the plasma obtained under such conditions can be so much in equilibrium that noticeable inversion of the populations of some of the D-levels with respect to the indicated P-levels is impossible. For example, in the experiments for the  $9D_{5/2} \rightarrow 8P_{1/2}$  transition, it reaches  $\sim 10^8 \text{ cm}^{-3}$ .

1/2



USSR

MORGULIS, N. D., et al., Ukrainskiy Fizicheskiy Zhurnal, Vol 16, No 2, February 1971, pp 335-338

This inversion depends essentially on the experimental conditions and on the value of  $x$ . On the basis of this and previous experiments it is possible to draw the conclusion that the occurrence of this inversion is connected with the effect of superhigh-frequency plasma oscillations existing in the diode under these conditions. Finally, the generation conditions for stimulated radiation are calculated as an example. All of these conditions are favorable, although it is possible to select better ones than used in the given example.

2/2

- 44 -

Acc. Nr.

AA0108179

Abstracting Service:  
CHEMICAL ABST. 6-70

Ref. Code

UR 0482

135550m Tool steel. Zaichenko, S. S.; Polushkin, N. A.;  
Kalmykov, Yu. D.; Chichkanov, A. I.; Shevchenko, V. I.;  
Biryukova, V. N.; Aref'ev, B. V. U.S.S.R. 260,900 (Cl. C 22c),  
08 Jan 1970, Appl. 25 Jul 1968; From *Otkrytiya, Izobret., Prom.  
Obraztsy, Tovarnye Znaki* 1970, 47(4), 81. Tool steel contg.  
lower amts. of scarce materials consisted of: C 0.50-0.65, Si  
0.60-0.90, Mn 0.20-0.40, Cr 6.5-8.0, Mo 1.1-1.5, W 0.7-1.1,  
V 0.10-0.25, Ti 0.05-0.15%, Fe and impurities the remainder.

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REEL/FAME

19891845

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UDC 002.001

POLUSHKIN, V. A.

"Document Information Conversion"

Moscow, Nauchno-Tekhnicheskaya Informatsiya, Series 2, No 12, 1970, pp 5-8

Abstract: The processes connected with document data conversion (indexing, abstracting, preparation of summaries, and so on) constitute one of the main areas of information handling and processing. The study presented here is an effort to establish the common attributes and differences between individual processes of document data conversion and to investigate the relation between scientific information and scientific research activities in this respect. Thirteen basic document information conversion processes are tabulated with respect to purpose and results based on a two-step conversion process consisting of an analytical-synthetic study of the content of the text and preparation of a new text the form of which will depend on the specific stated goals. As a result of the study it is found that document information conversion processes cannot be limited to the traditional forms of information processing such as abstracting and reviewing. These processes can be distinguished with respect to the results obtained, depending on purpose, degree of introduction of new information, and so on, but their general essence remains the same.

1/2

USSR

POLUSHKIN, V. A., Nauchno-Tekhnicheskaya Informatsiya, Series 2, No 12, 1970,  
pp 5-8

From the point of view of information conversion processes there are no sharp boundaries between scientific information and scientific research work. There are a number of processes which can be expanded in a defined series, with gradual transition from scientific information to scientific research work. The essence of information conversion processes indicates that the best results can be obtained when these processes are carried out by specialists in the field to which the analyzed text or documents belong. The laws which can be discovered in informatics connected with the processes of document information conversion must go beyond the scope of this field and will have a general scientific nature. The proposed approach to classifying information conversion processes offers the hope of solving the problem of converting document information once and obtaining various results simultaneously.

2/2

USSR

UDC 535.853:535-14

STANEVICH, A. YE., ZAZVORKA, V. V., POLUSHKIN, YU. I., and RUDYAVSKAYA, I. G.,  
Candidates of Technical Sciences

"A Spectrophotometer for the Long-Wave Infrared Region"

Leningrad, Optiko-Mekhanicheskaya Promyshlennost', No 6, Jun 73, pp 32-37

Abstract: A description is given of the first domestically produced two-beam SP-143 spectrophotometer for the 20-500 micron region, and results of tests on an experimental model are presented. The instrument is designated for automatic recording of the absorption spectra of solid, liquid, and gaseous objects at various temperatures, as well as reflection spectra of solid specimens.

Spectra of atmospheric water vapor, recorded during single-beam and two-beam operation of the instrument are presented. The spectral resolution of the instrument is  $0.5-1.0 \text{ cm}^{-1}$ , the precision is to within  $\pm 0.5 \text{ cm}^{-1}$ , the photometric exactness is to within 1-2%, and the purity of the spectra is, as a rule, not less than 99%. 3 figures. 1 table. 6 references.

1/1

USSR

UDC 621.371.18:533.951

YEREMIN, B. G., LITVAK, A. G., POLUYAKHOV, B. K. [Nauchno-issledovatel'skiy radiofizicheskiy institut--Scientific-Research Radio Physics Institute]

"Investigation of Thermal Electromagnetic Wave Self-Focusing in Plasma"

Izv. VUZ: Radiofizika, Vol XV, No 8, Aug 1972, pp 1132-1138

Abstract: The results are presented of a study of thermal self-focusing of electromagnetic waves of the microwave band in an isotropic weakly-ionized plasma. The experimental study was conducted on a unit consisting of a microwave generator (CW magnetron with power up to 100 W), a vacuum chamber, an injector, a receiving waveguide, a tuned filter, a dielectric antenna, a double T-piece, and a klystron oscillator. It is shown that the special features of the phenomena observed are in good agreement with existing theoretical assumptions. 5 fig. 5 ref. Received by editors, 17 Dec 1971.

1/1

USSR

MAZEL', A. G., POLUZ'YAN, ZH. A., and NIKOLAYEVA, T. I.

"Technological Measures Associated With Pipeline Welding Under Winter Conditions"

Moscow, Stroitel'stvo Truboprovodov, No 11, 1970, pp 31-33

Abstract: The authors present the technological measures for welding pipelines made from complex alloyed steel with a high carbon equivalent and with a wall thickness greater than 15 mm. These measures include: preheating, use of a heat-insulating belt, and increasing linear energy during welding. The following graphs are given: temperature in the weld as a function of cooling time after preheating for various metal thicknesses and the effect of a heat insulating belt on the cooling of a weld. A table is given for the relationship between welding time and number of welders. Diagrams are also given for the temperature distribution along the seam perimeter of 1420-mm-diameter pipes with 17-mm wall during welding using the continuous separation method with UONI 13/55 electrodes and for the volume variation of the molten metal pool as a function of initial temperature. Formulas are derived which make it possible to determine the degree of increase needed in arc output or the decrease in the rate of welding so that the molten metal pool and, consequently, the temperature regime associated with seam formation at negative temperatures, will be the same as at positive temperatures (20°C). Original article: four figures, one table, two formulas, and six bibliographic entries.

1/1

Information Theory

USSR

UDC: 62-523.8; 535.8:681.2

KRAVTSOV, N. V., CHIRKOV, L. Ye., and POLYACHENKO, V. L. (edited by Academician B. N. Petrov)

Elementy Optoelektronnykh Informatsionnykh Sistem (Elements of Optoelectronic Information Systems), book, 223 pp, 1970. Published by the Academy of Sciences USSR, Ministry of Instrument Construction, Automation Techniques and Control Systems, Order of Lenin Institute of Control Problems (Automation and Remote Control), Printed by "Nauka" Publishing House, Moscow

Extract: The authors attempt to demonstrate the enormous potentialities of optical electronics in information technology, to systematize the various methods of constructing optoelectronic devices, and to classify them.

Many problems in optoelectronics have not been adequately covered in this book; a number have merely been stated, while others have been ignored. The authors attempted not so much to treat exhaustively all possible optoelectronic elements in information systems and their design principles, but to interest the reader in the new trends in modern science and to focus attention on the great promises it represents.

1/4



USSR

KRAVTSOV, N. V., et al, Elementy Optoelektronnykh Informatsionnykh Sistem (Elements of Optoelectronic Information Systems), book, 223 pp, 1970. Published by the Academy of Sciences USSR, Ministry of Instrument Construction, Automation Techniques and Control Systems, Order of Lenin Institute of Control Problems (Automation and Remote Control), Printed by "Nauka" Publishing House, Moscow

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1. Methods of generating and amplifying optical signals	31
2. Recording of optical signals	36
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4. Forming of two-dimensional optical images	55

2/4

USSR

KRAVTSOV, N. V., et al, Elementy Optoelektronnykh Informatsionnykh Sistem (Elements of Optoelectronic Information Systems), book, 223 pp, 1970. Published by the Academy of Sciences USSR, Ministry of Instrument Construction, Automation Techniques and Control Systems, Order of Lenin Institute of Control Problems (Automation and Remote Control), Printed by "Nauka" Publishing House, Moscow

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USSR

KRAVTSOV, N. V., et al, Elementy Optoelektronnykh Informatsionnykh Sistem (Elements of Optoelectronic Information Systems), book, 223 pp, 1970, Published by the Academy of Sciences USSR, Ministry of Instruction Construction, Automation Techniques and Control Systems, Order of Lenin Institute of Control Problems (Automation and Remote Control), Printed by "Nauka" Publishing House, Moscow

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[Note: Approximately half of the 225 references cited in the bibliography are to USSR papers and publications.]

4/4

I/2 022

UNCLASSIFIED

PROCESSING DATE--23OCT70

TITLE--CORRELATION BETWEEN ENTHALPIES OF THE FORMATION AND DISSOLUTION OF HALIDES AND THE STANDARD ELECTRODE POTENTIALS OF METALS -U-  
AUTHOR--(03)-POLYACHENOK, L.D., NOVIKOV, G.I., POLYACHENOK, O.G.

COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(3), 613-16

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ENTHALPY, HALIDE, THERMODYNAMIC PROPERTY, ELECTRODE POTENTIAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1893

STEP NO--UR/0076/70/044/003/0613/0616

CIRC ACCESSION NO--AP0118855

UNCLASSIFIED

2/2 022

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0118855

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ENTHALPIES OF FORMATION, DELTAH SUBF DEGREES, AND DISSOLN., DELTAH SUBDDEGREES, OF A METALLIC HALIDE MX SUBZ (M IS A Z VALENT METAL AND X EQUALS F, CL, BR, OR I) IS RELATED TO THE STD. ELECTRODE POTENTIAL PHIDEGREES OF THE METAL M THROUGH THE EQUATION (DELTAH SUBFDEGREES PLUS DELTAH SUBDDEGREES)-Z EQUALS A PLUS BPHIDEGREES, WHERE A AND B ARE EMPIRICAL CONSTS. THE VALUE OF B IS 21 PLUS OR MINUS 2 KCAL-MOLE AND A CAN BE CALCD. ON THE BASIS OF THE THERMODYNAMIC PARAMETERS OF THE RESP. ACID. THE VALUES OF A FOR MX ARE 69.4, 32.4, 21.1, AND 6.1; 75.4, 38.4, 27.1, AND 12.1 FOR MX SUB2, 78.4, 41.4, 30.1, AND 15.1 FOR MX SUB3, AND 80.3, 43.3, 32.0, AND 17.0 KCAL-G EQUIV, RESP., FOR MX SUB4. FACILITY: BELORUSS. TEKHNOL. INST. IM. KIROVA, MINSK, USSR.

UNCLASSIFIED

172 022

UNCLASSIFIED

PROCESSING DATE--23OCT70

TITLE--CORRELATION BETWEEN ENTHALPIES OF THE FORMATION AND DISSOLUTION OF HALIDES AND THE STANDARD ELECTRODE POTENTIALS OF METALS -U-

AUTHOR--(03)-POLYACHENOK, L.D., NOVIKOV, G.I., POLYACHENOK, O.G.

COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(3), 613-16

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ENTHALPY, HALIDE, THERMODYNAMIC PROPERTY, ELECTRODE POTENTIAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1893

STEP NO--UR/0076/70/044/003/0613/0616

CIRC ACCESSION NO--AP0118855

UNCLASSIFIED

2/2 022

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0118855

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. ENTHALPIES OF FORMATION, DELTAH  
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 SUBZ (M IS A Z VALENT METAL AND X EQUALS F, CL, BR, OR I) IS RELATED TO  
 THE STD. ELECTRODE POTENTIAL PHIDEGREES OF THE METAL M THROUGH THE  
 EQUATION (DELTAH SUBFDEGREES PLUS DELTAH SUBDDEGREES)-Z EQUALS A PLUS  
 BPHIDEGREES, WHERE A AND B ARE EMPIRICAL CONSTS. THE VALUE OF B IS 21  
 PLUS OR MINUS 2 KCAL-MOLE AND A CAN BE CALCD. ON THE BASIS OF THE  
 THERMODYNAMIC PARAMETERS OF THE RESP. ACID. THE VALUES OF A FOR MX ARE  
 69.4, 32.4, 21.1, AND 6.1; 75.4, 38.4, 27.1, AND 12.1 FOR MX SUB2, 78.4,  
 41.4, 30.1, AND 15.1 FOR MX SUB3, AND 80.3, 43.3, 32.0, AND 17.0 KCAL-G  
 EQUIV, RESP., FOR MX SUB4. FACILITY: BELORUSS. TEKHNOL. INST. IM.  
 KIROVA, MINSK, USSR.

UNCLASSIFIED

USSR

UDC: 621.396.6-181.5

TAREYEV, A. N., FRIDLENDER, B. I., POLYACHEK, G. P.

"Calculation of the Temperature Conditions of Microcircuits Mounted on Printed Circuit Boards (External Problem)"

Sb. nauchn. tr. po probl. mikroelektroniki. Mosk. in-t elektron. tekhn.  
(Collected Scientific Works on Problems of Microelectronics. Moscow Institute of Electronic Technology), 1970, vyp. 5, pp 79-80 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6V182)

Translation: This paper deals with calculation of the temperature field of a printed circuit board with integrated microcircuits as heat sources. The external arrangement of the microcircuits on the board is analyzed from the standpoint of heat conditions. Resumé.

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2. NT

AAO 108732

Abstracting Service:  
CHEMICAL ABST.

470

Ref. Code  
PUK 0000

135538p Hard facing metallic articles with electrically  
 conductive refractory powder without fusion. Polyachenko, A.  
 V.; Zlotin, Yu. A. (State All-Union Scientific-Research Techno-  
 nological Institute of Maintenance and Operation of Machine  
 and Tractor Stock) Brit. 1,185,869 (Cl. C 23c), 25 Mar 1970,  
 Appl. 21 Dec 1967; 7 pp. Facings of hard powd. materials  
 such as carbide, boride, nitride, or silicide of W, Mo, Cr, Ti,  
 V, or Ta, are more uniform than arc-fused facings, and not  
 impaired by fusion, if the powder is spread on the surface to be  
 faced, and covered with a thin sheet of steel, or more compatible  
 nonferrous metal, of about the same thickness as the powder  
 layer preferably 0.05-1 mm, and the assembly is then consolidated  
 by pressure of 1-47 kg/mm<sup>2</sup> applied by 1 or 2 narrow rolling  
 electrode wheels moving over all parts of the face area, and im-  
 parting heat by elec. current impulses sufficient to at least par-  
 tially fuse the sheet which is pressed around the hard particles  
 to bond them firmly to the metallic article without melting them.  
 Before applying the pressure with current pulses from the elec-  
 trode, the powder can be fastened to either the base surface or  
 the covering sheet by pressure or with an org. evaporable ad-  
 hesive, thus insuring uniform distribution. Several alternate

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layers of powder and different or the same covering sheets can be used if desired. Immediately behind the moving wheel-electrode applying current pulses and pressure, a cooling liq. or gas stream can be applied to the hot bonded facing, but is not required for hardening. If the covering sheet over the bonded hard-particle layer is too thick, it can be machined off to expose edges of the hard particles, but the necessity for such machining is preferably avoided. A hard facing having  $\sim 165 \text{ cm}^2$  area was thus applied in 2 min. by fastening  $200\text{-}30 \mu \text{ WC}$  powder on a  $0.4\% \text{ C}$  steel sheet  $0.3 \text{ mm}$  thick of that size with glycol, laying the coated side of the sheet on the substrate, and applying  $180 \text{ kg}$  pressure from each of 2 roller electrodes  $95 \text{ mm}$  in diam. and  $4 \text{ mm}$  wide, with  $20 \text{ kA}$  pulses of  $1 \text{ msec}$  duration at  $15 \text{ pulses/sec}$ , against every part of the other surface of the sheet.

George F. Comstock

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19900512

Acc. Nr: AP0034072 - Abstracting Service:  
CHEMICAL ABST. 4-70

Ref. Code:  
UR 0078



71278u Zinc chloride-gallium trichloride vapor-phase system.  
Komshilova, O. N.; Poluechov, O. G.; Novikov, G. I.  
(Beloruss. Tekhnol. Inst. im. Kirova, Minsk, USSR). *Zh. Neorg. Khim.* 1970, 15(1), 251-4 (Russ). Sald. vapor pressure ( $p$ ) of  $GaCl_3$  was detd. and its value agrees with that obtained by W. Fisher and O. Juebermann (1936). The obtained equil. const. ( $K_p$ ) of  $(Ga_2Cl_6) \rightleftharpoons 2GaCl_3$  is:  $\log K_p$  (mm) =  $9.605 \pm 0.051 - (4370 \pm 34)/T(185-538^\circ)$ . The values of thermodynamic parameters at 298°K are (compd.,  $\Delta H^\circ$  in kcal/mole,  $\Delta S$  in e.u.):  $GaCl_3$ ,  $-106 \pm 2.3$ ,  $77.3 \pm 1.5$ ;  $Ga_2Cl_6$ ,  $-223 \pm 2.5$ ,  $122.5 \pm 1.5$ . Analogous study was made for  $(Zn_2Cl_4) \rightleftharpoons 2ZnCl_2$  system.  $\log p$  of  $ZnCl_2$  is  $8.866 - 6032/T$  (500-700°) and  $\log K_p$  of dimerization is  $9.44 - 5600/T$ . Vapor pressure of  $ZnCl_2-GaCl_3$  system indicates absence of chem. interaction between the components in the vapor phase. HMJR

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18 Li

REEL/FRAME

19710715

Acc. Nr.:

AP 0029118

Ref. Code: UR 0246

PRIMARY SOURCE: Zhurnal Nevropatologii i Psikhatrii, 1970,  
Vol 70, Nr 1, pp 125-127

THE CESSATION OF AN EPILEPTICAL STATUS  
AND SERIAL SEIZURES BY AMYTAL-CAFFEINE

Shmilovich, L. A., and Polyak, A. I.

The authors report of a clinical study of 50 patients where there was a successful ces-  
sation of an epileptical status and serial seizures by the aid of amytal-caffeine treatment  
The proposed method is one of the modifications of a combination of barbiturates with caf-  
feine, adapted to conditions of an epileptical seizures, where urgent measures are necessary  
The paper contains recommendations for the practical use of the indicated method.

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19680630

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USSR

UDC 62-50

POLYAK, B. T., and TSYPKIN, YA. Z. (Moscow)

"Pseudogradient Adaptation and Learning Algorithms"

Moscow, Avtomatika i Telemekhanika, No 3, Mar 73, pp 45-68

Abstract: There are various algorithms for finding the unconditional extremum of some functional  $J(c)$ , which determines the optimality test. These include regular algorithms -- in which there is random gradient realization -- and searching algorithms -- in which the direction of motion is a finite-difference gradient approximation (Kiefer-Wolfowitz-type methods), a random vector (random search methods), or a determinate vector not directly related to the gradient. There are also situations in which the optimality test is undifferentiable, and in some cases a generalization of the gradient concept (the method of generalized stochastic gradients) can be used. And there are many adaptation and learning algorithms of a nongradient character.

The purpose of the present article is to develop a general approach to encompass the various situations from a unified standpoint. Such an

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• USSR

POLYAK, B. T., and TSYPKIN, YA. Z., *Avtomatika i Telemekhanika*, No 3, Mar 73, pp 45-68

approach, based on the concept of the pseudogradient, considers an iterative algorithm of the form

$$c[n] = c[n-1] - \gamma[n]s[n].$$

It is assumed that there is a certain determinate smooth functional  $J(c)$ , which may be given a priori (if the initial problem is its minimization) or introduced artificially.  $s[n]$  is said to be the pseudogradient of  $J(c)$  at the point  $c[n-1]$  if the following condition is satisfied.

$$\nabla J(c[n-1])^T Ms[n] \geq 0.$$

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USSR

POLYAK, B. T., and TSYPKIN, YA. Z., *Avtomatika i Telemekhanika*, No 3, Mar 73, pp 45-68

If  $s[n]$  is the pseudogradient of  $J(c)$  at each step, the iterative algorithm is said to be a pseudogradient algorithm.

The article proves a general theorem on the convergence of pseudogradient algorithms and gives various examples of its use.

3/3

USSR

KISHKIN, S. T., et al., Izvestiya Akademii Nauk SSSR, Metally,  
No 1, Jan 71, pp 142-143

of the  $\gamma'$  phase and formation of networks of dislocations on the phase division boundary surface and in the solid solution. The addition of small amounts of magnesium and oxides of the rare earth elements causes stabilization of the structure and retards the movement of dislocations.

2/2

APPROVED FOR RELEASE: 08/09/2001

CIA-RDP86-00513R002202510009-0

USSR

UDC 669.245'26

KISHKIN, S. T., POLYAK, E. V., and SOROKINA, L. P., Moscow

"Fine Structures of Ni-Cr-Based Alloys and Their Heat Resistance"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, No 1, Jan 71, pp 142-143

Abstract: Some results of electron microscope studies of changes in the fine structure of heat-resistant alloys under conditions of simultaneous long-term application of high temperature (over 0.5 m. p.) and tensile stresses are described, as well as methods of stabilization of the structure. The studies were performed by the method of thin sections in transmitted light with specimens of type ZhS6KP and ZhS6K alloys. During the first stage of creep, dislocations split, forming subtraction and intrusion packing defects. This causes a decrease in the creep rate. During the second stage of creep, in connection with diffusion processes, disruption of the coherent bonding between the  $\gamma'$  and  $\gamma$  phases occurs, along with oriented coagulation of particles

1/2



USSR

POLYAK, D. G., ROZENTAL', G. O.

"Increasing the Accuracy of Statistical Modeling of Queuing Systems"

Avtomatika i Vychisl. Tekhn. [Automation and Computer Technology], 1972, No 6, pp 54-58 (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V313, by the authors).

Translation: Two methods are suggested for decreasing the dispersion of estimates for the stable characteristics of queuing systems with static modeling of the systems by digital computer. It is assumed that the random processes being averaged are regenerating. The first method consists in the introduction of a set of supplementary events and modeling the random processes averaged for the case when these events occur. The second method consists in preliminary partial averaging of the random processes modeled in defined intervals according to certain parameters. In particular, this method is used to produce new estimates for the probability of loss of a request, more accurate than earlier estimates in many cases studied. Furthermore, the article suggests an economical method of decreasing the bias of estimates.

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USSR

UDC: 534.222.2

POLYAK, E. B. and SHER, Ye. N.

"Shape of the Blowout Eddy in the Explosion of a String Charge in a Two-Layered Medium"

Moscow, Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, No 2, 1973, pp 143-146

Abstract: This paper is the consequence of an earlier article (V. M. Kuznetsov, O forme voronki vybrosa pri vzryve na poverkhnosti grunta -- Shape of the Blowout Eddy in an Explosion on the Ground Surface -- FizTF, No 3, 1960) in which the following problem was posed. The ground is modeled by a medium which is an ideal compressible liquid flowing at velocities exceeding some critical value, and an absolutely solid body at lower velocities. In the impulse statement of the problem, the blowout eddy is defined as the line of a current whose absolute value of velocity is equal to the critical value. In the present paper, the stated problem is to determine the form of the blowout eddy in the explosion of a string charge placed in the ground at a certain depth and covered by a layer of stronger material to a second depth. The authors

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USSR

UDC: 534.222.2

POLYAK, E. B., et al, Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, No 2, 1973, pp 143-146

begin their theoretical analysis with a mathematical statement of the problem using a complex flow potential, in terms of dimensionless Cartesian variables, and consider the effect of the parameter values on the geometry of the current.

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- 44 -

POLYAK, I. I., SHAKHMEYSTER, V. A.

"Program for Approximation of Functions of Several Variables by Algebraic Polynomials Using the Method of Least Squares"

Tr. Gl. Geofiz. Observ. [Works of the Main Geophysical Observatory], No 289, 1971, pp 29-32, (Translated from Referativnyy Zhurnal, Kibernetika, No 3 V540 by the author's).

Translation: The realization of the basic relationships of the linear theory of the method of least squares is studied for polynomials of several variables in the input language of the TA-IM translator.

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USSR

POLYAK, I. I.

"Single-Level Polynomial Objective Analysis of Meteorological Fields"

Tr. Gl. Geofiz. Observ. [Works of Main Geophysical Observatory], No 289, 1971, pp 33-38, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V549 by the author).

Translation: An algorithm and program for single-level polynomial objective analysis of meteorological fields are presented. The coefficients of the polynomials are defined by the method of least squares. The approximation measurements can be statistically related. The power of the polynomials is from zero to third.

The estimates of interpolation quantities and their statistical characteristics are calculated.

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USSR

USSR

GRIB, N. K., POLYAK, I. I.

"Program for Single-Level Objective Analysis by the Method of Optimal Interpolation"

Tr. Gl. Geofiz. Observ. [Works of Main Geophysical Observatory], No 289, 1971, pp 5-10, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V551 by the author's).

Translation: An algorithm and program are presented for single-level objective analysis of meteorological fields. The algorithm is realized as a procedure in TA-1M translator input language and allows studies to be performed in order to produce various statistical estimates.

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USSR

ZHURAVLEVA, Ye. B., KAGAN, R. L., POLYAK, I. I.

"Calculation of Autocorrelation and Mutual Correlation Functions on the Basis of Several Realizations of a Random Process"

Tr. Gl. Geofiz. Observ. [Works of Main Geophysical Observatory], No 289, 1971, pp 20-28, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V567 by the author's).

Translation: An algorithm and program (in TA-1M translator input language) are presented for calculation of the autocorrelation (covariation) and mutual correlation (covariation) functions.

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USSR

IL'IN, B. M., POLYAK, I. I., (Editors).

"Standard Algorithms for Processing of Meteorological Information"

Standartnye Algoritmy po Obrabotke Meteorologicheskoy Informatsii [English Version Above], Leningrad, Gidrometeoizdat Press, 1971, 68 pages, (Translated from Referativnyy Zhurnal, Kibernetika, No 2, 1972, Abstract No 2 V707 K).

NO ABSTRACT.

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USSR

POLYAK, I. I., MESHCHERSKAYA, A. V., YAKOVLEVA, N. I.

"Calculation of Primary Components in a System of Random Vectors"

Tr. Gl. Geofiz. Observ. [Works of Main Geophysical Observatory], No 289, 1971, pp 11-19, (Translated from Referativnyy Zhurnal, Kibernetika, No 2, 1972, Abstract No 2 V727 by the author).

Translation: An algorithm and program (in the input language of the TA-1M translator) are presented for reduction of random vectors to an orthogonal bases. The program is written considering the specifics of its utilization for solution of the problem of expansion of meteorological fields with respect to natural orthonormalized functions.

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1/2 007 UNCLASSIFIED PROCESSING DATE--11SEP70  
 FILE--SCREW FEEDER FOR FREE FLOWING MATERIAL --U-  
 AUTHOR--GAVRILIN, A.V., FRAYMAN, R.S., REYBAKH, M.S., POLYAK, L.G.  
 COUNTRY OF INFO--USSR  
 SOURCE--KHIM. PROM. (MOSCOW) 1970, 46(1) 60-3  
 DATE PUBLISHED-----70  
 SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR  
 TOPIC TAGS--MATERIAL HANDLING, FEED MECHANISM  
 CONTROL MARKING--NO RESTRICTIONS  
 DOCUMENT CLASS--UNCLASSIFIED  
 PROXY REEL/FRAME--1988/1337 STEP NO--UR/0064/70/046/001/0060/0063  
 CIRC ACCESSION NO--AP0106114  
 UNCLASSIFIED

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272 007

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0106114

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A GRAVITY SCREW FEEDER FOR THERMALLY UNSTABLE, FINELY DIVIDED SOLIDS IS DESCRIBED; ITS MAIN COMPONENT IS A ROTATING SPIRAL CHANNEL, AND ITS ACCURACY IS IN MOST CASES PLUS OR MINUS 1PERCENT, INDEPENDENTLY OF THE DIRECTION OF ROTATION.

UNCLASSIFIED

Information Theory & Pattern Recognition

USSR

UDC: 681.325.65

IGNATOV, V. A., KONAREV, A. P., PETROPOL'SKIY, N. V., POLYAK, L. M.

"An Angle-to-Code Converter"

USSR Author's Certificate No 327509, filed 21 Apr 69, published 10 Apr 72  
(from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 1, Jan 73, abstract No 1B459 P)

Translation: Converters for changing shaft position to code are known which contain a phase shifter; a power supply; an amplifier; and a series circuit comprised of a null detector, control module, square pulse generator, frequency dividers, flip-flops, coincidence gates, and a register. The register input is connected to the output of the control module, and the output is connected through a coincidence gate to the output of one of the frequency dividers. A disadvantage of such converters is the high error rate of conversion.

To reduce conversion error, the proposed converter contains an additional multiple-pole phase shifter and two parallel networks made up of an amplifier, null detector, flip-flop, coincidence gate, OR gate, and pulse counter connected in series. The inputs of these networks are connected

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USSR

IGNATOV, V. A., USSR Authors Certificate No 327509

to the outputs of the main and auxiliary phase shifters respectively, and the outputs are connected to the input of the register.

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USSR

UDC 621.376.56

POLYAK, L. M.

"A Nearly Differential Quasiternary Code for Systems of Communication with Pulse-Code Modulation"

Moscow, *Elektrosvyaz*, No 11, 1970, pp 28-32

Abstract: The author proposes a new type of nearly differential quasiternary code designed for transmitting pulse-code modulated signals along cable communication lines. A transformation algorithm is described and the basic probability characteristics of the code are considered. Formulas are derived for the probability of the absence of errors  $P_{a.er.}$  and for the appearance of one  $P_{1.er.}$  and two  $P_{2.er.}$  errors for a single misalignment of a symbol on a line. The energy spectra of the nearly differential quasiternary code are compared with the energy spectra of a bipolar code and the FST code known from American literature. The proposed code can be used for the linear cable channels of communication systems with pulse-code modulation. It does not require special synchronization and retention of a large number of symbols and ensures the possibility of detecting misalignment. It also creates conditions which are beneficial for the operation of the regenerator time interval restoration circuits with self-pulsing and without imposing any kind of requirements on the initial binary signal. The proposed code has advantages

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USSR

POLYAK, L. M., *Elektrosvyaz'*, No 11, 1970, pp 28-32

over both the PST and B6ZS codes which are being recommended for use in the United States. Original article: four figures, one table, six formulas, and four bibliographic entries.

2/2

USSR

4

ARAKSIOV, A. G., KOLESNIKOV, B. P., KONONENKO, V. A., LUK'YANOV, A. N.,  
MALOV, V. V., POLYAK, L. Z., ROZANOV, A. N., and TITOV, B. V.

"Device for Studying Structural Changes in Refractory Metals and Alloys"

USSR Authors' Certificate No 356536, Cl. G 01n 23/20, filed 7 Dec 70, published 23 Oct 72 (from Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 32, 1972, p 121)

Abstract: The device, which studies structural changes during high-temperature strain in a vacuum or other environment, contains a working chamber with a beryllium window located on the front cover, a loading mechanism, clamps for the specimen, heaters, mechanisms for measurements and the recording of readings. For purposes of studying the structure of a specimen during tests, the front cover of the working chamber has mounted on it a device for X-ray analysis with a mechanism for the vertical displacement of this device along the specimen and a mechanism for rotating it around a horizontal axis.

1/1



USSR

UDC 616.981.57-085.33-092.9

POLYAK, M. S., Leningrad Scientific Research Institute of Antibiotics

"Experimental Antibiotic Therapy for Rare Variants of Anaerobic Gaseous Infection"

Moscow, Antibiotiki, Vol 18, No 6, Jun 73, pp 526-529

Abstract: This study was made to learn about the effectiveness of various antibiotics against *Cl. histolyticum*, *Cl. sordelli*, *Cl. sporogenes*, and *Cl. fallax*, pathogenic Clostridia that significantly aggravate the course of anaerobic gaseous infection and sometimes evoke the specific process independently. Tests were made in vitro and with experimental mice. The data obtained illustrate that antibiotics can exert a protective action in experimental infections caused by the above bacteria, but there are great differences in the sensitivity of these Clostridia to various antibiotics and, even more, in the ability of the antibiotics to influence the specific process. On the basis of the experiments the significant activity of morphocyclin and 7-chlor-7-desoxylincomycin was noted; intravenously introduced, they were effective against all the cultures. The protective action was most marked where the animals were infected with *Cl. histolyticum*. This result may be assumed to come from both the undoubted effectiveness of the

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USSR

POLYAK, M. S., Antibiotiki, Vol 18, No 6, Jun 73, pp 526-529

drugs and from characteristics of the model used. Where mice were infected with washed cells of the culture the therapeutic action of the antibiotics was constant and easily traced. Benzylpenicillin, which is highly rated for prophylaxis of anaerobic gaseous infection, proved active against contamination by *Cl. sordelli*, *Cl. sporogenes*, and *Cl. fallax*, but it did not prevent the development of disease where animals were infected with *Cl. histolyticum*. The greater activity of 7-chlor-7-desoxylincomycin in comparison with lincomycin gives reason to assume that it may be used successfully with both *Staphylococcus* and *Clostridium* infections.

2/2

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USSR

UDC 615.332 (LINCOMYCINUM).036.8:616.981.555-092.9

POLYAK, M. S. and MYASNIKOVA, L. G., Leningrad Scientific Research Institute of Antibiotics

"Experimental Study of Lincomycin in Gas Gangrene Infection"

Moscow, Antibiotiki, No 3, 1972, pp 218-222

Abstract: Lincomycin suppressed the multiplication of 15 pathogenic clostridial strains (*Cl. perfringens*, *Cl. oedematiens*, *Cl. septicum*, *Cl. histolyticum*, *Cl. sordelli*) in vitro at concentrations not exceeding 4 µg/ml (except *Cl. sordelli* which was resistant to the antibiotic). The bactericidal concentrations were generally twice the bacteriostatic. Bacteriostatic and bactericidal concentrations of erythromycin were in most cases similar to those of lincomycin. In experimental infection of mice caused by *Cl. perfringens* and *Cl. septicum*, lincomycin exhibited therapeutic activity, but it was ineffectual against *Cl. oedematiens* and *Cl. histolyticum*. When lincomycin was combined with tetracycline, the effect on all the *Cl. septicum*, *Cl. oedematiens*, *Cl. histolyticum*, and *Cl. sordelli* strains studied was negligible. However, a synergistic effect was noted in 7 of 8 *Cl. perfringens* strains treated with the two antibiotics. Study of the effect of sub-bacteriostatic concentrations of lincomycin and tetracycline on multiplication

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