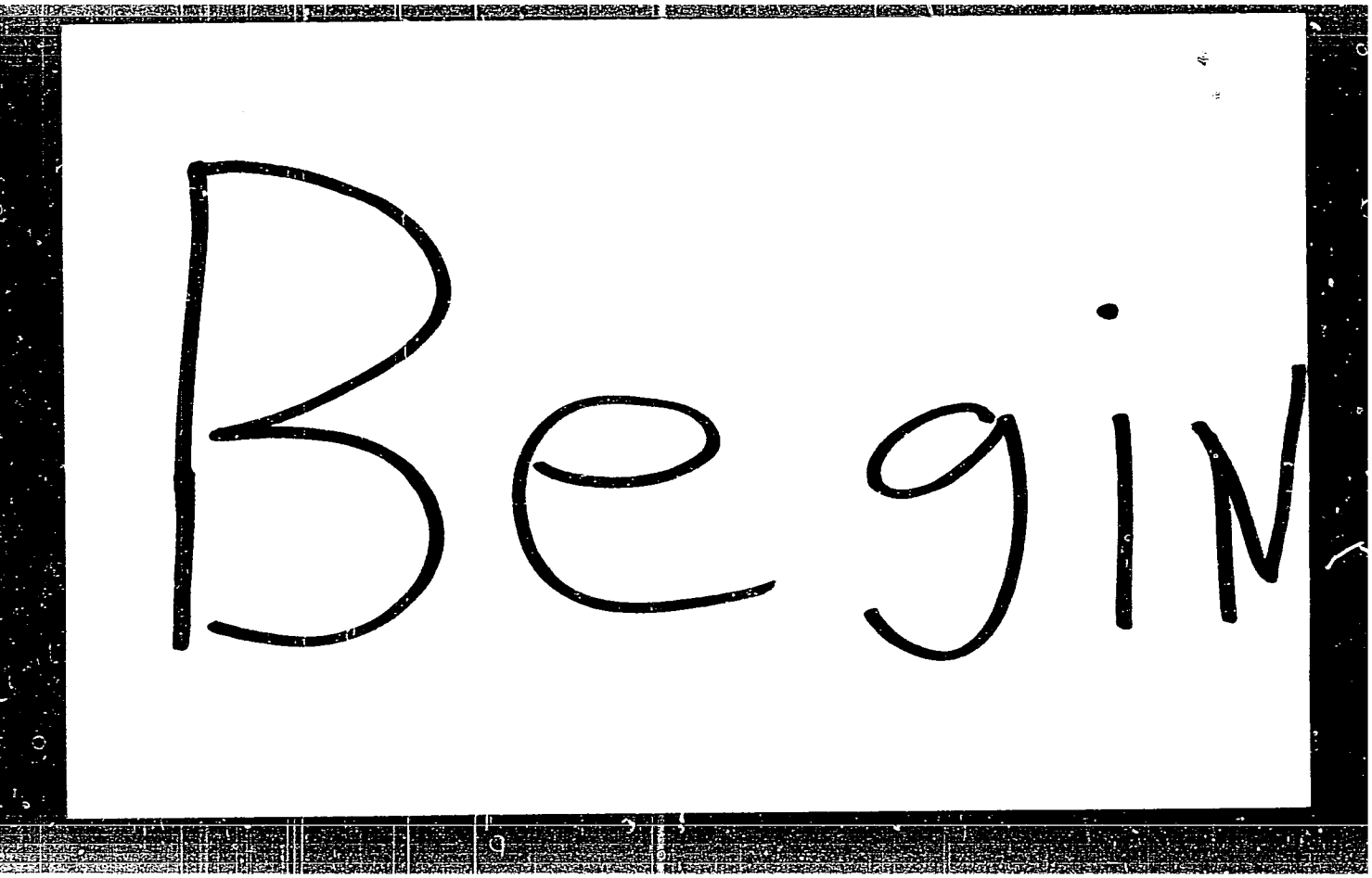

LYUBCHENKO, A.S., podpolkovnik

Coordinates should be given directly from the plane. Vest. Vozd. Fl. no.2:11-15 F '61. (MIRA 14:)
(Aeronautics, Military—Observations)

S/181/62/004/006/041/051
B108/B138

AUTHORS: Pilat, I. M., Anatychuk, L. I., and Lyubchenko, A. V.

TITLE: Heat conductivity of cadmium antimonide

PERIODICAL: Fizika tverdogo tela, v. 4, no. 6, 1962, 1649-1654

TEXT: The temperature dependences of the coefficient $\varkappa$ of heat conduction, electrical conductivity σ, thermo-emf α, and Hall constant of p-type CdSb single crystals were measured in the range of 77-420°K. $\varkappa$ was measured with thermocouples in a steady flow of heat (Ye. D. Devyatkova, I. A. Smirnov. ZhTF, 27, 1944, 1957). At low temperatures heat conduction is mainly due to the phonon mechanism. This was confirmed by the hyperbolic $\varkappa$-versus-T curves. At high temperatures, however, a rise in $\varkappa$ of CdSb single crystals was observed. This appears to be due to the transmission of infrared light at high temperatures. There are 6 figures and 1 table.

ASSOCIATION: Chernovitskiy gosudarstvennyy universitet (Chernovtsy State University)

SUBMITTED: November 29, 1961 (initially)
February 22, 1962 (after revision)

Card 1/1

L 2197-66 EWT(1)/EWT(m)/EWP(t)/EWP(b) IJP(c) JD

ACCESSION NR: AP5014571 UR/0181/65/007/006/1717/1732

AUTHOR: Lashkarev, V. Ye.; Lyubchenko, A.V.; Sheynkman, M.K.

TITLE: Comprehensive investigation of the kinetics of the processes of recombination and infrared quenching of photocurrent and cadmium sulfide

SOURCE: Fizika tverdogo tela, v. 7, no. 6, 1965, 1717-1732

TOPIC TAGS: recombination luminescence, recombination radiation, ir radiation, luminescence quenching, cadmium sulfide, cadmium selenide

ABSTRACT: In view of the fact that earlier studies of infrared quenching and recombination in CdS were limited only to stationary or slow transient processes, the authors propose new independent methods of determining the various parameters characterizing the centers of slow and fast recombination in a unipolar photoconductor. It is shown in particular, that the initial sections of the infrared quenching relaxation curves can yield additional information on the parameters of the various recombination centers in CdS. The methods are based on a simultaneous study of the kinetics of the photo-

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L 2197-66

ACCESSION NR: AP5014571

current and its infrared quenching in the presence of additional illumination produced by short duration light pulses of varying intensities and varying spectral contents. The measurements were made on thin single crystals of CdS and CdSe, grown by various methods. The constant illumination was produced with an incandescent lamp and a set of filters, and the additional light pulse was a flash lamp with pulse duration 2.5×10^{-6} sec and a set of filters. Longer pulses were produced with a mechanical disc shutter and an infrared monochromator. The pulse methods were supplemented with an analysis of the lux-ampere characteristic of the material. The parameters determined were the concentrations of the vacancies and of the electrons at the r- and s-levels, the concentrations of the levels themselves, the fractions of the various carriers captured at the r- and s-levels, and the cross section for the capture of an infrared photon by an unfilled r-center. The methods for obtaining the various parameters are indicated. The values of the recombination-center parameters measured by various methods, in single crystal CdS, and in part also in CdSe are good agreement. Orig. art. has: 7 figures, 26 formulas, and 3 tables.

Card 2/3

L 2197-66

ACCESSION NR: AP5014571

ASSOCIATION: Institut poluprovodnikov AN UkrSSR, Kiev (Institute of Semiconductors, AN Ukr SSR)

SUBMITTED: 22Dec64 ENCL: 00 SUB CODE: SS, OP

NR REF SOV: 009 OTHER: 006

Card 3/3

L 64309-65 EWA(h)/EWT(m)/T IJP(c) AT

ACCESSION NR: AP5012762 UR/0020/65/161/006/1310/1312

AUTHORS: Lashkarev, V. Ye. (Academician AN UkrSSR); Lyubchenko, A. V.; Sheynkman, M. K.

TITLE: Determination of the parameters of recombination centers in cadmium sulfide with the aid of the kinetics of infrared photocurrent quenching

SOURCE: AN SSSR. Doklady, v. 161, no. 6, 1965, 1310-1312

TOPIC TAGS: cadmium sulfide, radiative recombination, recombination reaction, capture cross section, IR photoconductor

ABSTRACT: Since earlier investigations of infrared quenching of photocurrent in semiconductors of the type $A_{II}B_{VI}$ have been made under stationary conditions or under slow transient conditions (on the order of several seconds or minutes), the authors investigated the kinetics of the infrared quenching by using short pulses, to be

Card 1/2

L 64309-65

ACCESSION NR: AP5012762

3

able to determine the cross section for the capture of electrons by the recombination centers, and to determine the cross section for the capture of an infrared photon by a slow-recombination r-center. The theory of the phenomenon is discussed briefly. Pulses of 2.5 μsec from an infrared lamp (0.93 μ wavelength) were used. The cross section for the capture of an infrared photon by the r-level was found to be 0.8×10^{-16} cm^2, which is of the same order as the geometrical dimension of the atom. The probabilities for electron capture by s-centers and r-centers were found to be $(4--20) \times 10^{-10}$ and $(3--5) \times 10^{-13}$ cm^3/sec, the latter being close to those obtained by the authors by another method earlier (Fiz. tverd. tela v. 5, 387, 1963). Orig. art. has: 2 figures.

ASSOCIATION: Institut poluprovodnikov Akademii nauk UkrSSR (Institute of Semiconductors, Academy of Sciences UkrSSR)

SUBMITTED: 11Dec64 ENCL: 00 SUB CODE: SS,OP

NR REF SOV: 003 OTHER: 002

Card 2/2

L 26588-66 EWT(1)/T/EWA(h) IJP(c) AT

ACC NR: AP6011430 SOURCE CODE: UR/0020/66/167/004/0795/0798

AUTHORS: Sheynkman, M. K.; Lyubchenko, A. V.

ORG: Institute of Semiconductors, Academy of Sciences, UkrSSR (Institut poluprovodnikov Akademii nauk UkrSSR)

TITLE: Two parallel mechanisms for the capture of carriers by one recombination center

SOURCE: AN SSSR. Doklady, v. 167, no. 4, 1966, 795-798

TOPIC TAGS: semiconductor capture, ir phenomenon, capture cross section, color center, recombination luminescence, transition probability

ABSTRACT: The authors report that they have observed in CdS, for the first time, recombination which proceeds via several channels through one type of center, and specifically that hole capture by the r-center can occur in parallel by two channels -- via a definite excited state and by bypassing this state. This was observed by investigating the kinetics of infrared quenching by a procedure described earlier (FTT

Card 1/2 UDC: 537.312.51 + 537.312.52 + 537.312.6

L 26588-66

ACC NR: AP6011430 2

v. 7, 1717, 1965; DAN v. 161, 1310, 1965), illuminating the CdS crystals with weak absorbed light on which short infrared pulses at both extinction maxima (1.4 and 0.9 ev) were superimposed. By measuring the frequencies corresponding to the two transitions and by measuring directly the fraction of the released holes as a function of the temperature, it becomes possible to determine the ratio of the probabilities of the two processes and the excitation energy of the excitation level. The results can be reconciled with theoretical calculations only by assuming the presence of the two simultaneous capture mechanisms. It is pointed out that this demonstrated possibility of simultaneously realizing two different carrier capture mechanisms by the center should be taken into account both during the interpretation of the recombination and luminescence processes on impurity centers in semiconductors, as well as in the study of the properties of different F and V centers in alkali halide crystals. The authors thank Academician of AN UkrSSR V. Ye. Lashkarev and Doctor of Physical Mathematical Sciences E. I. Rashba for interest in the work and discussion. This report was presented by Academician A. V. Shubnikov on 21 July 1965. Orig. art. has: 2 figures and 7 formulas.

SUB CODE: 20/ SUBM DATE: 19Jul65/ ORIG REF: 004/ OTH REF: 006

Card 2/2 BK

SENKEVICH, Anton Aleksandrovich; MIKHAYLOV, V.N., dotsent; VASILENKO, P.I., prof., red.; LYUBCHENKO, B.M., dotsent, inzh., red.; VASILENKO, P.I., prof., red.; VORONIN, K.P., tekhn.red.

[Using prestressed construction elements in building hydraulic structures; dams, sluices, pavements, linings, et cetera] Primenenie predvaritel'nogo napriazheniia v konstruktsiiakh gidrotekhnicheskikh sooruzhenii; plotiny, shliuzy, pokrytiia poverkhnostei i dr. Pod obshchei red. P.I.Vasilenko. Moskva, Gos.energ.izd-vo. (Materialy po proektirovaniiu gidroenergeticheskikh uzlov. Ser.4. Gidroelektrostantsii. Gidrotekhnicheskie sooruzheniia. Konstruktsii i materialy). Pt.2. 1960. 40 p. (MIRA 13:6)

1. Nachal'nik Sektora obmena opytom Otdela tipovogo proyektirovaniya i tekhinformatsii instituta "Gidroenergoproyekt" (for Mikhaylov).
(Prestressed concrete) (Hydraulic structures)
(Pavements, Concrete)

BOROVOY, A.A., red.; LYUBCHENKO, B.M., inzh., red.; TOROPOV, L.N., red.; VORONIN, K.P., tekhn. red.

[Materials of the Scientific Technological Conference on Arch Dams] Trudy Nauchno-tekhnicheskogo soveshchaniia po arochnym plotinam, Moscow, 1959. Pod obshchei red. A.A.Borovogo. Moskva, Gos.energ.izd-vo, 1961. 182 p. (MIRA 15:1)

1. Nauchno-tekhnicheskoye soveshchaniye po arochnym plotinam, Moscow, 1959.
(Dams)

DYSHKO, Ye.I., kand. tekhn. nauk, red.; RZHONSNITSKIY, B.N., kand. tekhn. nauk, red.; LYUBCHENKO, B.M., inzh., red.

[Construction specifications and regulations] Stroitel'nye normy i pravila. Moskva, Gosstroiizdat. Pt.2. Sec.I. ch.1. [Hydraulic structures in rivers; basic regulations for design (SNiP II-I. 1-62)] Gidrotekhnicheskie sooruzheniia rechnye osnovnye polozheniia proektirovaniia (SNiP II-I. 1-62). 1962. 31 p. (MIRA 16:5)

1. Russia (1923- U.S.S.R) Gosudarstvennyy komitet po delam stroitel'stva.2. Gosudarstvennyy komitet Soveta Ministrov SSSR po delam stroitel'stva (for Dyshko). 3. Vsesoyuznyy nauchno-issledovatel'skiy institut gidrotekhniki (for Rzhonsnitskiy). 4. Vsesoyuznyy trest po proektirovaniyu gidroelektrostantsiy i gidroelektrouzlov (for Lyubchenko). (Hydraulic structures--Standards)

SOV/84-59-9-34/66

32(1)

AUTHOR: Lyubchenko, D., Chief Engineer of the Radar and Radio-Navigation Service

TITLE: The Automated Corridor Precision Approach Localizers (Corridor Homing Radio-Stations)

PERIODICAL: Grazhdanskaya aviatsiya, 1959, Nr 9, pp 20-21 (USSR)

ABSTRACT: The author describes how his (unidentified) airport has automated three of its 4 corridor homing radio-stations by using the transmitter of its distant homing radio-station, which, for this purpose, transmits a signal of a certain frequency and duration. This eliminates the necessity of having an extra transmitter and secures a high quality of the signal. Then the author provides a general description of the contents and functioning of the employed PTU-2 remote control attachment to the available PAR-7 transmitters, illustrating it by a block-diagram; he briefly mentions how the radar operator operates his control desk. The al-

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SOV/84-59-9-34/66

The Automated Corridor Precision Approach Localizers (Corridor Homing Radio-Stations)

ready accomplished automation of three corridor homing radio-stations has proved its efficiency and resulted in a reduction of servicing personnel. The airport is about to automate its 4th corridor homing station, adding to it a signaling device to signalize the starting of the emergency power supply unit. There is 1 block diagram. ✓

Card 2/2

ACCESSION NR: AP4033690 S/0193/64/000/004/0005/0007

AUTHOR: Sizov, Ye. A.; Lyubenko, E. A.

TITLE: Experimental use of hard alloy rolls for rolling ultra thin strips

SOURCE: Byulleten' tekhniko-ekonomicheskoy informatsii, no. 4, 1964, 5-7

TOPIC TAGS: metal strip, metal strip thickness (0.0015 mm), rolling mill, steel roll, tungsten carbide roll, hard alloy roll, VK-8 tungsten carbide, high polish finish, carbide roll wear resistance

ABSTRACT: Metal strip thickness has been reduced from 0.03 mm to 0.0015 mm in experiments at the Central Scientific-Research Institute of Ferrous Metallurgy by replacing two steel rolls (3 mm diameter) in all 20 rolls of a rolling mill with VK-8 tungsten carbide rolls (4.5 and 5.5 mm diameters). The number of passes is reduced by half and the highly polished strip surface resulting requires no additional finishing. Tungsten carbide rolls have to be made to more exact specifications than steel rolls due to greater hardness and less

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ACCESSION NR: AP4033690

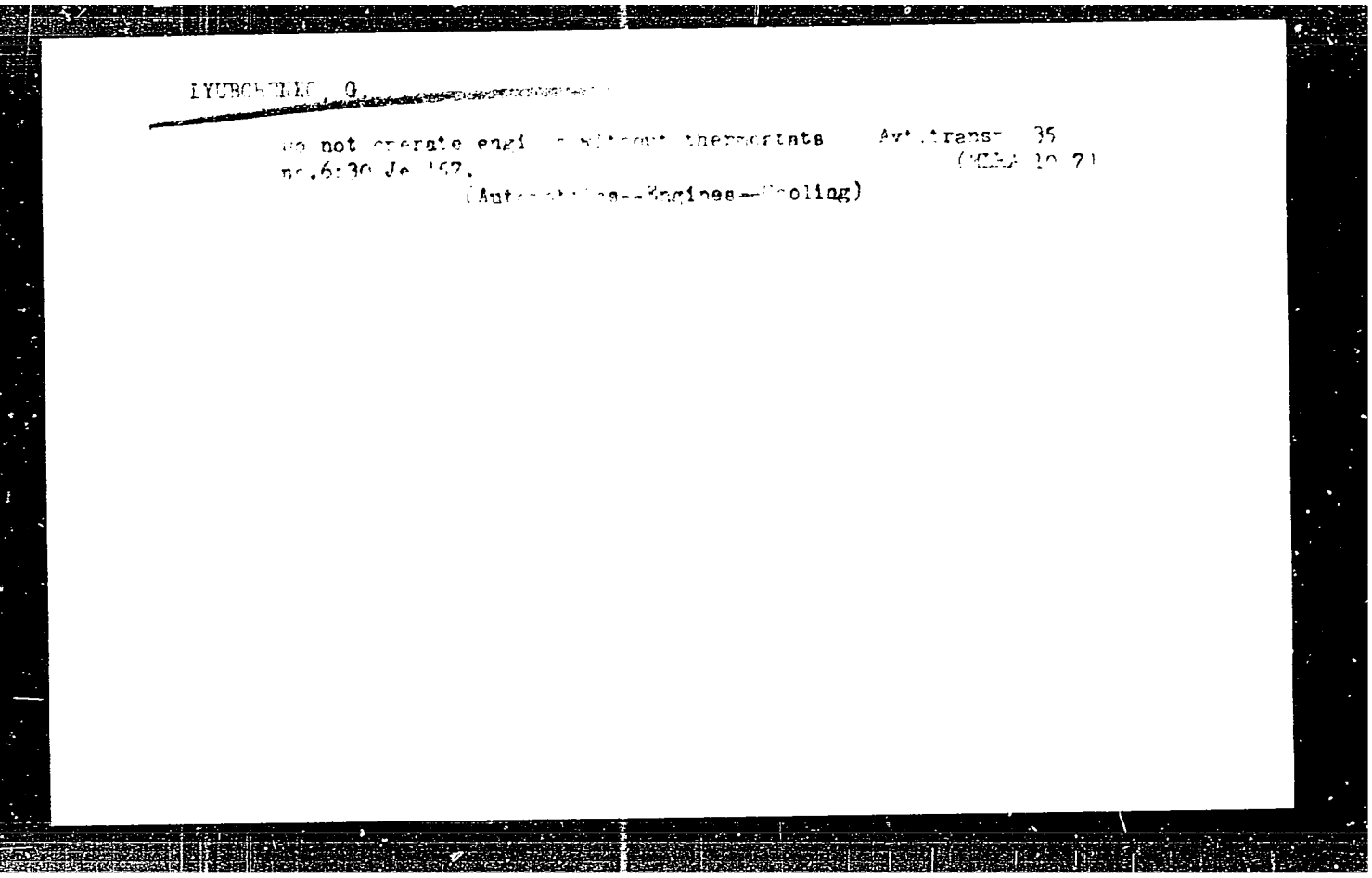
elasticity. The tungsten carbide rolls last 20 to 50 times longer than steel rolls in finishing low carbon steel and 15 to 20 times longer in finishing stainless and alloy steels. The working parts of steel punches last twice as long when used on steel finished by carbide rolls. Rolls made of the harder tungsten carbide VK6M will be tested for further reduction of strip thickness. Orig. art. has: None.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NR REF SOV: 000 OTHER: 000

Card 1 2/2



LYUBCHENKO, O.

... do not operate engi... without thermostats. Av. trans. 35 (MIRA 10:7)
no.6:30 Je '57.
(Automobiles--Engines--Cooling)

LYUBENKO, G. F., Cand Tech Sci -- (diss) "Investigation of the process of packing rock by the method of compression in the worked area leading to the active area of exploitation of a broad stope." Leningrad, 1960. 24 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Leningrad Mining Inst im G. V. Plekhanov); 170 copies; price not given; (KL, 52-60, 120)

SOV/21-58-11-1/28

AUTHOR: Lyubchenko, G.G.

TITLE: Methods of D[illegible]rmining the Identical Truth or Falsity of the Calculus of Assertion Formulae of Bivalent Logic (Metody raspoznavaniya tozhdestvennoy istinnosti i lozhnosti formul ischisleniya vyskazyvaniy dvuznachnoy logiki)

PERIODICAL: Dopovidi Akademii nauk Ukrains'koi RSR, 1958, Nr 11, pp 1153-1156 (USSR)

ABSTRACT: In connection with the problem of switching the operation of calculating machines from numerical computations to those denoted by letters, a method is needed to discriminate between the identically true and false formulae of bivalent logic, which can be applied automatically by a machine. For this purpose, a set of algorithms should be found, from which the optimum algorithm could be chosen for mechanical performance. The author looked for the rules on the basis of which various algorithms could be construed for determining identically true and false formulae of the calculus of assertion formulae of bivalent logic. He has found five sets of rules which make it possible to determine this by means of logical operations of one of the 16 combinations of these operations. The rules are designed for transform-

Card 1/2

Methods of Determining the Identical Truth or Falsity of the Calculus of Assertion Formulae of Bivalent Logic

ation into logarithms which can be used in calculating machines. These rules differ in a number of peculiarities from those of the known method of determining identical truth or falsity of formulae, and this makes them more effective for using in calculating machines. There are 2 tables and 2 Soviet references.

ASSOCIATION: Vychislitel'nyy tsentr AN UkrSSR (Computing Center of the AS UkrSSR)

PRESENTED: By Member of the AS UkrSSR, B.V. Gnedenko

SUBMITTED: July 2, 1958

NOTE: Russian title and Russian names of individuals and institutions appearing in this article have been used in the transliteration.

16(1), 28(2) SOV/41-10-4-3/11

AUTHOR: Lyubchenko, [illegible] Kyiv

TITLE: The Method of the Choice of Logical Operations and Mechanisms Effecting them For Digital Computers (Metodika vybora logicheskikh operatsiy i mekhanizmov ikh vypolnyayushchikh dlya tsifrovykh vychislitel'nykh mashin)

PERIODICAL: Ukrainskiy matematicheskiy zhurnal, 1958, Vol 10, Nr 4, pp 375-388 (USSR)

ABSTRACT: Given: 1) logical operations and other logical means realizable in the device to be constructed; 2) the class of Boolean functions the values of which have to be computed by the device; 3) the probability of the appearance of each single one of these functions at the work of the device; 4) the time and the energy used by the device for carrying out every logical operation; 5)list of the constructive elements for the device; 6) a number characterizing the complicatedness of the device. - Determine: 1) A set of logical operations so that the number of logical operations used for the description of all functions of the given class is minimal; 2) a set of logical operations for which the scheme of the logical mechanism is most simple; 3) a set of logical operations for which the calculation of the formula can be carried out in a minimal time with a minimal

Card 1/2

The Method of the Choice of Logical Operations and Mechanisms [illegible] Digital Computers SOV/21-10-4-3/11

energy; 4) a set of logical operations satisfying the postulates 1) - 3) simultaneously best.
The solution proposed by the author uses only 11 logical operations (one-digit and two-digit ones), where for the final choice of the operations and the mechanism 2037 variants have to be investigated, a problem solved by estimating three times the goodness of the single variants, whereby the choice can be made in relatively little steps.
There is one figure and 6 references, 1 of which is Soviet, 4 American, and 1 German.

SUBMITTED: May 30, 1958

Card 2/2

LYUBCHENKO, G.G., Cand Phys Math Sci -- (diss) "Problems ~~bivalent~~ logic connected with the de igning and operating of electronic ~~calculators.~~" Kiev, 1959, 6 pp (Acad Sci UkSSR. ~~United~~ Scientific Council of the Institutes of Physics and Mathematics) 140 copies (KL, 28-59, 122-123)

S/02[illegible]
A153/A029

AUTHORS: Hordeladze, Sh.H., Lyubchenko, G.G.

TITLE: On a Quick-Action Machine for Measuring the Brilliance and Coordinates of Stars on Negatives

PERIODICAL: Dopovidi Akademiyi nauk Ukrayins koyi RSR 1962 Nr. 6. pp. 766 - 769

TEXT: Stressing the urgency of some astrophysical problems (the problem of the structure of the Galaxy, for example), requiring for their solution the knowledge of various physical characteristics of a large number of stars (including their brilliancy in different spectral regions), the authors emphasize the necessity for developing a quick-action measuring and computing automatic machine for dealing with such problems and discuss the basic principles of the possible design of such a machine. The readout of the machine, operating with star photographic negatives, comprises stellar magnitudes [coordinates of centers (x_0, y_0)], spherical (α, δ) and Cartesian coordinates of stars. This would-be machine could measure 36,000 star coordinates per hour, giving out 6,000 stellar magnitudes. Such machines could be widely used for discovering and studying variable stars in

Card 1/2

S/021/60/000/006/007/019
A153/A029

On a Quick-Action Machine for Measuring the Brilliance and Coordinates of Stars on Negatives

great numbers, replacing the work effort of about 300 persons. A block diagram of such a would-be machine is given on p. 767, each component of which is described with respect to its functions and scope. There are 2 figures and 1 block diagram.

ASSOCIATION: Astronomichna observatoriya AN UkrSSR. Obchyslyuval nyy tsentr AN UkrSSR (Astronomical Observatory of the AS UkrSSR Computation Center of the AS UkrSSR)

PRESENTED: by B.V. Hnyedenko, Academician, AS UkrSSR

SUBMITTED: February 15, 1960

Card 2/2

26856
S/021/60/000/008/002/011
D210/D305

16.8000 (1121, 1329, 1344)

AUTHOR: Lyubchenko, ~~N.N.~~ G. G.

TITLE: On representing Boole functions by formulae

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Dopovidi, no. 8, 1960, 1011 - 1015

TEXT: The aim of the paper is to find an algorithm which allows one to represent the function $f(x_1, x_2, \ldots, x_n)$ given by matrix (1) by a formula in any complete system of one and two-locus functions and not containing the variables on which the function does not depend essentially. The Boole function $(x_n, x_{n-1}, \ldots, x_1)$ is given by a normal matrix which has the form

x_n	x_{n-1}	...	x_3	x_2	x_1	$\varphi(x_n, x_{n-1}, \ldots, x_1)$
0	0	...	0	0	0	A_1
0	0	...	0	0	1	A_2

(1)

Card 1/6

26856
3/021/60/000/008/002/011
D210/D305

On representing Boole functions ...

$$\begin{array}{l} 0\ 0\ \ldots 0\ 1\ 0\ A_3 \\ 0\ 0\ \ldots 0\ 1\ 1\ A_4 \\ \ldots\ \ldots\ \ldots \\ \ldots\ \ldots\ \ldots \\ 1\ 1\ \ldots 1\ 1\ 1\ A_{2^n} \end{array} \qquad (1)$$

and will be denoted as

$$(x_n\ x_{n-1}\ \ldots\ x_1)//A_1\ A_2\ \ldots\ A_2{}^n//. \qquad (2)$$

Following A.A. Markov (Ref. 1: Trudy Matm. in-ta im. V.A. Steklova, 42 Izd.-vo, AN SSSR 1954) the alphabet $\mathfrak{A}\{0, 1, x_1, x_2, \ldots, x_n, \alpha_1\alpha_2, \ldots, \alpha_t\}$ is considered, where $x_1, x_2, \ldots, x_n$ - variable 0 - true, 1 - false and $\alpha_1, \ldots, \alpha_2$ operations &, $\overline{\&}$, V, $\overline{V}$, $\rightarrow$, $\overrightarrow{=}$, $\leftarrow$, $\overleftarrow{=}$, $\sim$, $\overline{\sim}$, —. A formula in the alphabet $\mathfrak{A}$ at fixed α_1,

Card 2/6

On representing Boole functions ...

$\alpha_2, \ldots, \alpha_t$ is defined as follows: a) 0, 1, $x_1, \ldots, x_n$ are formulae; b) if M and P are formulae, then $\bigcirc$ M P is a formula, where $\bigcirc$ is any operation of alphabet $\mathfrak{A}$; c) all other words are not formulae. The author gives two algorithms: Algorithm 1) This permits one to represent $f(x_1, x_2, \ldots, x_n)$ given by matrix (1) by a formula which does not contain variables x_p, on which the functions $f(x)$ does not depend essentially and Algorithm 2 which permits one to find a formula with a small length; in the case where each x_i appears not more than once, the formula has the least length.

Algorithm 1. 1^0. From the matrix (2) one forms the word

$$\&Vx_n\varphi_1 \to x_n\varphi_2, \tag{5}$$

where $\varphi_1 \equiv (x_{n-1}x_{n-2}\ldots x_1)\| A_1A_2\ldots A_{2^{n-1}}\|,$

$\varphi_2 \equiv (x_{n-1}x_{n-2}\ldots x_1)\| A_{2^{n-1}+1} \times A_{2^{n-1}+2}\ldots A_{2^n}\|.$

Card 3/6

On representing Boole functions ...

In word (5) one replaces matrices

$$(x_n x_{n-1} \ldots x_1)//0\ 0\ \ldots\ 0// \qquad (3)$$

and

$$(x_n x_{n-1} \ldots x_1)//1\ 1\ \ldots\ 1// \qquad (4)$$

by 0 and 1, and φ_2 by φ_1 if $\varphi_2 \equiv \varphi_1$. To the transformed word one applies H.A. Markov's substitutions

$$\begin{array}{ll}
\&Vx_n0 \to x_n0 \Rightarrow 0, & (6) \\
\&Vx_n0 \to x_n1 \Rightarrow x_n, & (8) \\
\&Vx_n\varphi_1 \to x_n0 \Rightarrow \rightleftarrows x_n\varphi_1, & (10) \\
\&Vx_n\varphi_1 \to x_n0 \Rightarrow Vx_n\varphi_1, & (12) \\
\&Vx_n\varphi_1 \to x_n\varphi_1 \Rightarrow \varphi_1. & (14)
\end{array}
\qquad
\begin{array}{ll}
\&Vx_n1 \to x_n1 \Rightarrow 1, & (7) \\
\&Vx_n1 \to x_n0 \Rightarrow -x_n, & (9) \\
\&Vx_n0 \to x_n\varphi_2 \Rightarrow \&x_n\tau_2, & (11) \\
\&Vx_n1 \to x_n\tau_2 \Rightarrow \to x_n\tau_2, & (13) \\
\&Vx_n\varphi_2 \to x_n - \varphi_1 \Rightarrow \rightleftarrows x_n\varphi_1. & (15)
\end{array}$$

where $\Rightarrow$ means a symbol of substitution. If at first substitution of one of (6), (7), (8) and (9) is fullfilled then the proceedings have to be stopped. In all other cases, one passes to the

Card 4/6

On representing Boole functions ...

next step: 2^0. In the obtained word one replaces each matrix by a word obtained from it by step 1^0, and proceeds in this way until all matrices disappear. Then one makes substitutions

$$Vx_k - x_s \rightarrow \leftarrow x_k x_s, \quad (16) \qquad \overline{\leftarrow} x_k - x_s \rightarrow \bar{V} x_k x_s, \quad (17)$$

$$\&x_k - x_s \rightarrow :: x_k x_s, \quad (18) \qquad \rightarrow x_k - x_s \rightarrow \bar{\&} x_k x_s, \quad (19)$$

$$\exists x_k - x_s \rightarrow \sim x_k x_s \quad (20)$$

(k, s = 1, 2, ..., n). The algorithm is slightly changed if t = R < 11. Algorithm 2 is applied to the functions of type

$$(\psi_m \psi_{m-1} \cdots \psi_1)//A_1 A_2 \cdots A_2 m//, \quad (22)$$

where ψ_k (k = 1, 2, ..., m) are formulae, and shows how to find the shortest formula. Both algorithms are suitable for electronic machines or automatic devices. There are 4 Soviet-bloc references.

Card 5/6

26856
S/021/60/000/008/002/011
D210/D305

On representing Boole functions ...

ASSOCIATION: Obchyslyuval'nyy tsentr AN URSR (Computer Center AS UkrSSR)

PRESENTED: by B.V. Gnyedenko, Academician AS UkrSSR

SUBMITTED: November 23, 1959

Card 6/6

29182
S/021/60/000/010/004/018
D251/D303

16.7000 16.6800

AUTHOR: Lyubchenko, H.H.

TITLE: Logical synthesis of schemes of arrangements which realize Boole functions of a certain class

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Dopovidi, no. 10, 1960, 1331 - 1333

TEXT: For the synthesis of a minimal scheme of arrangements which realize Boole functions, a known set of algorithms is used. The author attempts to simplify the working by considering only a certain class of Boole functions. The logical operations

$$\&,\ \bar{\&},\ \vee,\ \bar{\vee},\ \rightarrow,\ \bar{\rightarrow},\ \leftarrow,\ \bar{\leftarrow},\ \sim,$$

and the formulae in the alphabeth α with $t = 11$ are considered. It is observed that the arrangement consists only of nuclei. The scheme is identified by a graph. The graph is a complex where a finite number of points (nuclei) occur, some of which are joined by cuts such that it is possible from one point to reach another,

Card 1/4

Logical synthesis of schemes of ...

moving along the cut; the graph has only a) input nucleus (or nuclei) b) initial nucleus c) one (or two) operational nuclei. The following denominations are assumed: for a) $x_i N$ or ON or OON; for b) N; for c) αN, and for the join (a)(b)cde, where α is the sign of the logical operation which realizes the nucleus, O is the falsehood constant, OO the truth constant, i = 1, 2, ..., n, N the number of nuclei in the graph and a and b are the numbers of the nuclei on which the join starts and finishes. A join going to an operational nucleus which realizes the formula aAB is said to be left if it symbolizes the introduction of the meaning A in the nucleus, and right if it symbolizes B. A left join has *l* and a right join has p in the denomination instead of d. A join going to a negation nucleus is considered as left. One join coming from a nucleus is called the basic join (e = 1) and the last join from that nucleus is the repeated join. A join going to an initial nucleus is neither left, right, basic nor repeated. The Γ-function is the function of algebraic logic with the shortest form in the alphabet α with t = 11 in which each x_i occurs once and once only.

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Logical synthesis of schemes of ...

The denomination of all nuclei and the joins of the scheme can be found from the given formulae with the help of the algorithm below: 1) When carrying out 1° for the s-th time, take N = s. If N = 1, proceed to 2), if N > 1, proceed to 4); 2) Write down from the given formulae all the various formulae for x_{i_1}, x_{i_2}, ..., x_{i_k} (i_j = -1, 0, 1, 2, ..., n, $x_{-1} = 0$, $x_0 = 00$), set against each of the formulae the corresponding symbol (1)1, (2)1,..., k(1) and form the denominations of the input nuclei x_{i_1} 1, x_{i_2}, 2, ..., x_{i_k}, K. Proceed to 3) Substitute for the formulae of x_i on for the terms $\alpha_i(K_{2i-1})N_{2i-1}(K_{2i})N_{2i}$ the symbols set against them. Proceed to 1). 4). If the term constructed in 3) has only one sign of a logical operation, then write down the various terms $\alpha_1(K_1)N_1(K_2)N_2$, $\alpha_2(K_3)N_3(K_4)N_4$,... $\alpha_m(K_{2m-1})N_{2m-1}(K_{2i})N_{2i}$ and set against them the corresponding symbols (q+1)N, (q+2)N,..., (q+m)N, where q is the greatest of the numbers which occur in the command in the cycle, con-

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Logical synthesis of schemes of ...

struct the denomination of the operational nucleus and by considering each term $\alpha_i(K_{2i-1}(N_{2i-1}(K_{2i})N_{2i}$ and setting against it the symbol $(q+1)N$, construct and place in the reckoning the denomination of the joins $(K_{2i-1})(q + i)N_{2i-1}\ell A$ and $(K_{2i})(q + i)N_{2i}pB$; if in the reckoning one first meets the denomination of a join starting from (K_{2i-1}) or (K_{2i}) or 0; if the joins named are not met with first, proceed to 3). The form for the Γ-function is found by means of methods given in the author's previous work: (Ref. 7: DAN URSR, 1011, 1960). The algorithms of the method given may be used for programming for quick-response computers. There are 7 Soviet-bloc references.

ASSOCIATION: Obchyslyuval'nyy tsentr AN URSR (Computer Center, AS UkrSSR)

PRESENTED: by B.V. Hnyedenko, Academician, AS UkrSSR

SUBMITTED: December 16, 1959

Card 4/4

55209
S/696/61/002/000/007/009
D299/D302

16.8000 (1031, 1132, 1329)

AUTHOR Lyubchenko, N.

TITLE Determining identical truth or falsity of formulas of algebra of logic

SOURCE Akademiya nauk Ukrayins'koyi RSR. Obchyslyuval'nyy tsentr. Zbirnyk prats' z obchyslyuval'noyi matematyky i tekhniky, v. 2, 1961, 39-58

TEXT: Effective methods are considered for the formalization of recognition rules of identical truth or falsity of the formulas of algebra of logic. The basic difference between the proposed methods and classical ones, consists in the fact that the formulas under consideration never increase (in length), in fact they become shorter in the majority of cases. This makes it possible for the computer to recognize the formulas by means of a given (minimal) number of memory cells. The set of rules obtained is formalized into recognition algorithms, the most suitable of which are selected for the computer. The rules are such that their use either involves some of the logical operation &, V, ¯, or none of them.

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S/696/61/002/000/007/009
D299/D302

Determining identical truth ...

The terms "word", "alphabet", "empty word" have the same meaning as in A.A. Markov (Ref. 1 Teoriya algorifmov (Theory of A gorithms), Trudy Matematicheskogo instituta im. V.A. Steklova, XLII, Izd-vo AS USSR, 1954). The algorithms are chosen in such a way that the computer should carry out its operation in minimum time and that a minimum number of memory cel's are used. Further, the symbols used are explained and the term "formula" defined. The equivalences, required for deriving the rules, are introduced. Equivalence-transformation rules of recognition are derived. Well-known axiomatic constructions of propositional calculus are formulated (Frege-Lukasiewicz, Whitehead-Russell), as well as the rules by which the corresponding formulas are derived. Three sets of recognition rules of identically true or false formulas are listed in a table. Several theorems are proved. Further, it is shown how the algorithms are formed from the rules. Two recognition algorithms are set forth, as examples. In all, 5 sets of rules were obtained, each of which permits the construction of a set of algorithms for recognizing identically true or false formulas whereby the formulas can be written by means of all (12) the

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sets of logical operations, each of which contains only a single two place operation (and by means of sets involving &, 0, $\bar{V}$, -). The methods used, as well as the rules obtained, are very similar; this similarity is the result of writing the formulas and the logical constants without parentheses. The similarity of the rules is evident from the following 1) each rule has the form of a Markov substitution; 2) the methods of recognition of identically true or false formulas unite the rules into a single method; 3) the rules do not involve the use of the distributive law; 4) the formulas to be recognized, have to be written by means of the listed set of operations in non-parenthetic form, without requiring a reduction to normal form. These peculiarities of the rules distinguish them from the classical method of recognition; the rules are suitable for formalization and hence for use by computers. There are 2 tables and 7 references 4 Soviet-bloc and 3 non-Soviet-bloc (including 1 translation). The references to the English-language publication read as follows E. Post, Introduction to a General Theory of Elementary Propositions, Amer.J.Math., 43, 1921; N.A. Routledge, Logic on electronic computers a practical method for reducing expressions to conjunctive normal form Proc. Cam. Philos. Soc., v. 52, p 2, 1952.

Card 3/3

S/696/61/003/000/001/011
D251/D304

16.0200

AUTHOR: Lyubchenko, N.N.

TITLE: On determining formulae of minimum length for functions of algebraic logic

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Obchyslyuval'nyy tsentr. Zbirnyk prats' z obchyslyuval'noyi matematyky i tekhniky, v. 3, 1961, 3 - 12

TEXT: The author defines his terms as follows: $\mathfrak{A}\{0\ 1\ x_1 x_2 \ldots x_n\ \alpha_1\ \alpha_2 \ldots\ \alpha_t\}$, is an alphabet,, where $x_1, x_2, \ldots, x_n$ are variables, 0 and 1 are the falsehood and truth constants, α_k ($k = 1, 2, \ldots, t$, $t = 1, 2, \ldots, 11$) $\alpha_p \neq \alpha_r$ for $p \neq r$ is one of the dyadic operations &, $\bar{\&}$, V, $\bar{\mathrm{V}}$, $\rightarrow$, $\overline{\rightarrow}$, $\leftarrow$, $\overline{\leftarrow}$, $\sim$, $\overline{\sim}$, or - (contradiction), α_1, $\alpha_2, \ldots, \alpha_t$ is the choice of operations which produces a complete system of functions. A formula is defined for fixed $\alpha_1, \alpha_2, \ldots, \alpha_t$

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On determining formulae of ...

as a word in $\mathfrak{A}$ which satisfies the conditions: a) 0, 1, x_1, x_2, ... x_n are formulae; b) if N is a formula, $\neg N$ is also a formula; c) if N and M are formulae, then $\circ NM$ is also a formula, where $\circ$ is some dyadic operation of $\mathfrak{A}$; d) all terminal words are not formulae. A formula of type K(FTK) is defined as a formula of the form $\circ x_{i_1} x_{i_2}$ ($i_1, i_2 = 1, 2, \ldots, n$, $i_1 \neq i_2$) or $\circ x_s B_{i_1, i_2, \ldots, i_k}$ or $\circ B_{i_1, i_2, \ldots, i_k}$ where $B_{i_1, i_2, \ldots, i_k}$ ($i_1, i_2, \ldots, i_k$ are different indices with variables in $B_{i_1, i_2, \ldots, i_k}$) is a formula of type K, $s \neq i_j$ ($j = 1, 2, \ldots, k$). A shortest formula (SF) of a function in an alphabet $\mathfrak{B}$ is defined as a formula in $\mathfrak{B}$ which expresses this function and has minimum length. The function $f(x_n, x_{n-1}, \ldots, x_1)$ (*) is considered, having a normal matrix of form

$$(x_n x_{n-1} \ldots x_1)//A_1 A_2 \ldots A_{2^n}// \qquad (3)$$

where $A_1 = f(0, 0, \ldots, 0, 0, 0)$, $A_2 = f(0, 0, \ldots, 0, 0, 1)$, ... A_{2^n}

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On determining formulae of ...

= (1, 1, ..., 1, 1, 1). Algorithm 1 is considered, by which a formula for (1) in $\mathfrak{A}$ is obtained which does not contain those variables x_p on which (1) does not essentially depend. This algorithm is based on construction of the word

$$\&\forall x_n \varphi_1 \longrightarrow x_n \varphi_2 \tag{7}$$

where $$\varphi_1 \equiv (x_{n-1}x_{n-2}\cdots x_1)//A_1A_2\cdots A_2^{n-1}// \tag{8}$$

and $$\varphi_2 \equiv (x_{n-1}x_{n-2}\cdots x_1)//A_2^{n-1}{}_1A_2^{n-1}{}_2\cdots A_2^n// \tag{9}$$

applying the first Markov substitution and substitution of the word thus obtained in each matrix. The adaptation of this method for the case $t = s \leq 11$, and the SF arising in this case is discussed. Theorem: If the function (1) does not depend essentially on x_k ($k = 1, 2, \ldots, n$), then the formula for this function obtained by algorithm 1 does not contain x_k. Theorem: If the function (1) depends essentially on less than 3 variables, then the formula obtained by al-

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gorithm 1 is the SF of this function. Theorem: If the function

$$\Phi(x_1, x_2, \ldots, x_n) \qquad (35)$$

depends essentially on $x_1, x_2, \ldots, x_n$ $(n \geqslant 3)$ and has an SF which belongs to the FTKs, then there always exists a normal matrix which defines the function (35) and forms with the transformation of algorithm 1 the SF of this function. The algebraic substitutions described by A.G. Kurosh (Ref. 5: Kurs vysshey algebry (Course of Higher Algebra), Gostekhizdat, 1955) the elements of the first being $x_1, x_2, \ldots, x_n$ in (3) and the elements of the second $A_1, A_2, \ldots, A_{2n}$ in (3) are discussed. It is stated that if the function (35) has an SF which belongs to the FTKs, then the SF of this function may be determined by algorithm 2. This algorithm consists of obtaining the matrix

$$(x_{i_n} x_{i_{n-1}} \ldots x_{i_1}) // A_i A_j \ldots A_{2n} \qquad (55)$$

from (3) by means of an invariant transformation, transforming (55)

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On determining formulae of ... S/696/61/003,000 001 011
D251/D304

by means of algorithm 1 and calculating the length of the formula thus obtained. The author then considers formulae of type M (FTM's) where, a) $x_1, x_2, \ldots, x_n$ is an FTM, b) an FTK is an FTM, c) If a formula N is an FTM and contains only $x_{i_1}, x_{i_2}, \ldots, x_{i_k}$ then the formula obtained from N by varying some x_{i_j} ($j = 1, 2, \ldots, k$) in the FTM is an FTM. It is stated that the formula $\& \vee x_1 x_2 \rightarrow x_1 x_3$ is the SF. The function (1) defined by the matrix

$$(\psi_m \psi_{m-1} \ldots \psi_1)//A_1 A_2 \ldots A_2{}^m// \qquad (56)$$

where ψ_1 is some FTM may be found from a table of results which is given. An algorithm (algorithm 3) for finding the SF in this case is given, based on a sequence of operations analogous to those of algorithms 1 and 2. The author states that the algorithms obtained may be employed in programming for rapid-action computers. There is 1 table and 6 Soviet-bloc references.

Card 5/5

LYUBCHENKO, G.G. [Liubchenko, H.H.]

A certain problem concerning the synthesis of the networks of electronic computers. Zbir. prats' z obchys. mat. i tekh. 3: 25-29 '61. (MIRA 15:2)

(Electronic calculating machines)
(Electronic circuits)

25486
S/021/61/000/005/004/012
D215/D304

16.6800 (1034, 1250, 1253)

AUTHOR: Lyubchenko, H.H.

TITLE: On binary codes for truth setups

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR, Dopovidi, no. 5, 1961, 604 - 607

TEXT: The aim of the article is to find an algorithm which permits one to determine the function f(u), the codes for its arguments $u_1, u_2, \ldots U_m$ and its values V_1, V_2, so that it can be transformed into a Boule function with the shortest formula in the alphabet. $x_1, x_2, \ldots x_n$ &, V (5) where x_j (j = 1, 2, ..., n) are variables with the values 0 and 1 only and & is a logical operation 'and' and v is a logical operation 'or'. Definitions:

$$N = [\log_2 m] + \begin{cases} 0 \text{ if } \log_2 m \text{ is a whole no.} \\ 1 \text{ if } \log_2 m \text{ is not.} \end{cases} \quad (4)$$

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On binary codes for truth ...

$[\log_2 m]$ is a greatest whole number not greater than $\log_2 m$. Ω formula of a bouleian function is defined by induction: (1) x_i is an Ω-formula, (2) if M and P are Ω-formula, then MP and vMP - are Ω-formulae too, (3) all other words are not Ω-formulae. Length of Ω-formula is the number of letters of the alphabet (5) in the Ω-formula. The algorithm is as follows: 1) To find in Table A, which defines function f(u) the amount p of letters V_s which appear in Table A more than on the same number of times as letter V_r. 2) To find such a number z, where $0 \leqslant z \leqslant 2^N - m$ for which $p + z$ is a multiple of 2^K with K as high as possible. ($k = 0, 1, \ldots N-1$). 3) To introduce into Table A, (2^N-m) letters U_{m+1}, U_{m+2} ... U_{2^n} and to ensure that for Z of this letter the function f(u) has values V_s for the rest of letters (2^N-m-z) the values V_r. 4) In the new table, which is obtained in this way, to change rows in such a way that each row with value V_s will be before each row with value

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On binary codes for truth ...

V_r (Table B). 5) In the table B substitute letters V_s by 0 and V_r by 1. 6) To replace each letter, which is a value of argument by the N-valued code (binary numbers) in such a way that a letter code in the first row is 0 and the letter code in the k-row is greater than a letter code in (k-1)st row by 1. The normal matrix $(x_n, x_{n-1} \ldots x_1)\ A_1 \ldots A_2$ (6) is then obtained. Procedure A(1) from the normal matrix (6) to form a word $\&vX_N\varphi_1 \rightarrow X_N\varphi_2$ where

$$\varphi_1 \equiv (X_{N-1}, X_{N-2} \ldots X_1)//A_1A_2 \ldots A_2N-1//$$

$$\varphi_2 \equiv (X_{N-1} \ldots\ldots\ldots X_1)//A_2N-1\ A_2N-1_{+1} \ldots A_2N//$$

(2) In this word all matrices of the type $(X, X_{-1} \ldots X_1)$ //0, 0 .. 0// to be replaced by 0 and all matrices of the type $(X_2, X_{-1} \ldots X_1)$ //1, 1, ... 1// to be replaced by 1. (3) To change

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$$\&VX_N0 \rightarrow X_N1 \text{ into } X_N$$

$$\&VX_N0 \rightarrow X_N\varphi_2 \text{ into } \&X_N\varphi_2$$

$$\&VX_N\varphi_1 \rightarrow X_N1 \text{ into } VX_N\varphi_1.$$

Procedure B. When the new word contains at least one normal matrix, start again with procedure A. When there are no matrices - then this word is the desired Ω-formula. As an example the author considers the function given by Table 1 (where m = 7, p = 6, N = 3, Z = 0) and finds the Ω-formula in the form & X_3X_2. There are 4 tables and 10 Soviet-bloc references.

ASSOCIATION: Obchyslyuval'nyy tsentr AN UkrRSR (Calculating Center AS UkrSSR)
PRESENTED: B. V. Gnyedenko, Member of AS UkrSSR
SUBMITTED: July 28, 1960

Card 4/5

LYUBCHENKO, Georgiy Georgiyevich; SERGIYENKO, Ivan Vasil'yevich; KORCLYUK, V.S., retsenzent; YUSHCHENKO, Ye.L., retsenzent; IL'ICHEVSKIY, S.A., red.

[Computers and programming] Matematicheskie mashiny i programmirovanie. Kiev, Izd-vo Kievskogo univ., 1963. 219 p. (MIRA 17:7)

ACCESSION NR: AT4031461 S/2526/64/000/026/0129/0132

AUTHOR: Lyubchenko, G. I.; Sokolov, O. O. (Sokolov, A. A.)

TITLE: Increasing the accuracy in the automatic recording of temperatures

SOURCE: AN UkrRSR. Insty*tut teploenergety*ky*. Zbirny*k prats', no. 26, 1964. Teploobmin ta gidrody*namika (Heat exchange and hydrodynamics), 129-132

TOPIC TAGS: temperature recording, thermometer, automatic thermometer, heat exchange

ABSTRACT: The authors describe a differential arrangement (see Figures 1 & 2 in the Enclosure) for increasing the accuracy in the measurement of temperatures which vary within narrow limits. In this arrangement, the sensor is connected to test circuit I, while circuit II is a resistance circuit. The voltage difference $\Delta U = U_1 - U_2$, taken from the test and resistance circuits, respectively, is recorded by an EPP-09 automatic potentiometer with an accuracy of $\pm$ 0.5%. The voltage U_2 is measured by an R-375 potentiometer with an accuracy of $\pm$ 0.04%. By virtue of the fact that U_2 is considerably greater than ΔU, the final accuracy is substantially increased, being on the order of $\pm$ 0.05 - 0.1%. For the purpose of illustrating the operational principle of the arrangement, a digital ex.mple

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ACCESSION NR: AT4039461

and error analysis is given, involving the direct recording of temperature with an EMP-209 electronic bridge. The authors note that this device can be used in the experimental investigation of heat exchange processes. Orig. art. has: 2 figures and several formulas.

ASSOCIATION: Insty*tut teploenergety*ky* AN UkrRSR (Institute of Thermal Energetics, AN UkrRSR)

SUBMITTED: 28May62	DATE ACQ: 12Jun64	ENCL: 02
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Card 2/4

ACCESSION NR: AT4039461

ENCLOSURE: 01

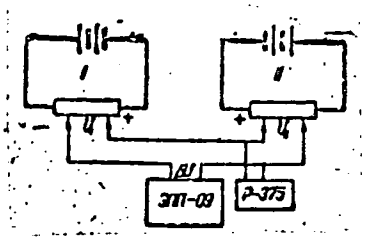

Fig. 1. Basic differential arrangement.

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ACCESSION NR: AT4039461

ENCLOSURE: 02

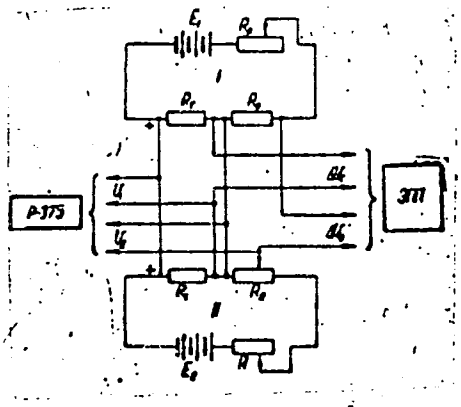

Fig. 2. Differential arrangement for the automatic recording of small temperature changes.

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Lyubchenko, O.I.

28(5) PHASE I BOOK EXPLOITATION SOV/4530

Akademiya nauk Ukrainskoy SSR. Institut elektrotekhniki

Voprosy magnitnykh izmereniy (Problems of Magnetic Measurements) Kiyev, Izd-vo AN UkrSSR, 1959. 117 p. 1,000 copies printed.

Ed. of Publishing House: I. Kisina; Tech. Ed: M.I. Yefimova; Editorial Board: A.D. Nesterenko, Corresponding Member, Ukrainian SSR Academy of Sciences (Resp. Ed.), S.A. Lebedev, Academician, S.I. Tetel'baum, Corresponding Member, Ukrainian SSR Academy of Sciences (Deceased), L.V. Tsukernik, Candidate of Technical Sciences, A.N. Milyak, Candidate of Technical Sciences, and Ye. V. Khrushchova, Candidate of Technical Sciences.

PURPOSE: This collection of articles is intended for designers and makers of electrical instruments and scientific staff members of research and plant laboratories engaged in electrical and magnetic measurement.

COVERAGE: The authors present results of magnetic measurements conducted at the Laboratory for Electrical and Magnetic Measurements of the Electrical Engineering Institute, Academy of Sciences, UkrSSR. They discuss testing of high coercive magnetic materials used in the manufacture of permanent magnets and compare various methods of testing hard magnetic materials. They also describe various methods of measuring field intensity and flux density and evaluate the accuracy of those methods. They discuss methods of testing soft magnetic materials and consider problems of resolving total iron core losses into components. They also discuss testing of ferromagnetic materials at high frequencies and describe problems of measuring losses with the aid of a calorimeter. References appear at the end of each article.

Fevraleva, N. Ye. Measurement of Field Intensity in Devices for Testing Hard Magnetic Materials by Means of a Test Generator 62

The author describes a test generator for measuring field intensity and discusses the generator error. The generator was developed at the Laboratory of Magnetic and Electrical Measurements of the Electrical Engineering Institute, Academy of Sciences, UkrSSR. There are 5 references, all Soviet.

Lyubchenko, O.I., A.D. Nesterenko, and N.Ye. Fevraleva. Errors of Devices For Testing High Coercive Magnetic Materials 71

The authors discuss devices used for determining residual magnetism and coercive force. Attention is given to a device with compensating coils and a bridge-type device developed at the Laboratory for Magnetic and Electrical Measurements of the Electrical Engineering Institute, Academy of Sciences, UkrSSR. The authors discuss the construction and operation of these devices and describe their characteristics. There are 5 references: 4 Soviet and 1 German.

Fevraleva, N.Ye. Utilization of the Hall Effect in Germanium for Measuring Magnetic Flux 86

The author presents a general description of the Hall effect and discusses its application for measuring magnetic flux. She describes a circuit using a germanium crystal for measuring flux and discusses circuit error. There are 8 references: 4 Soviet, 2 English and 2 German.

Karpenko, V.P. Calorimetric Method of Measuring Losses in Ferromagnetic Materials 96

The author discusses calorimeter circuits used for measuring iron losses at high frequencies. He also describes the error of the calorimetric method. There are 5 references, all Soviet.

Karpenko, V.P. Possibilities of Using T-Circuits for Magnetic Measurement 105

The author analyzes various T-circuits and discusses their application in determining magnetic characteristics of ferromagnetic materials at low and medium frequencies. There are 4 references: 2 Soviet and 2 English.

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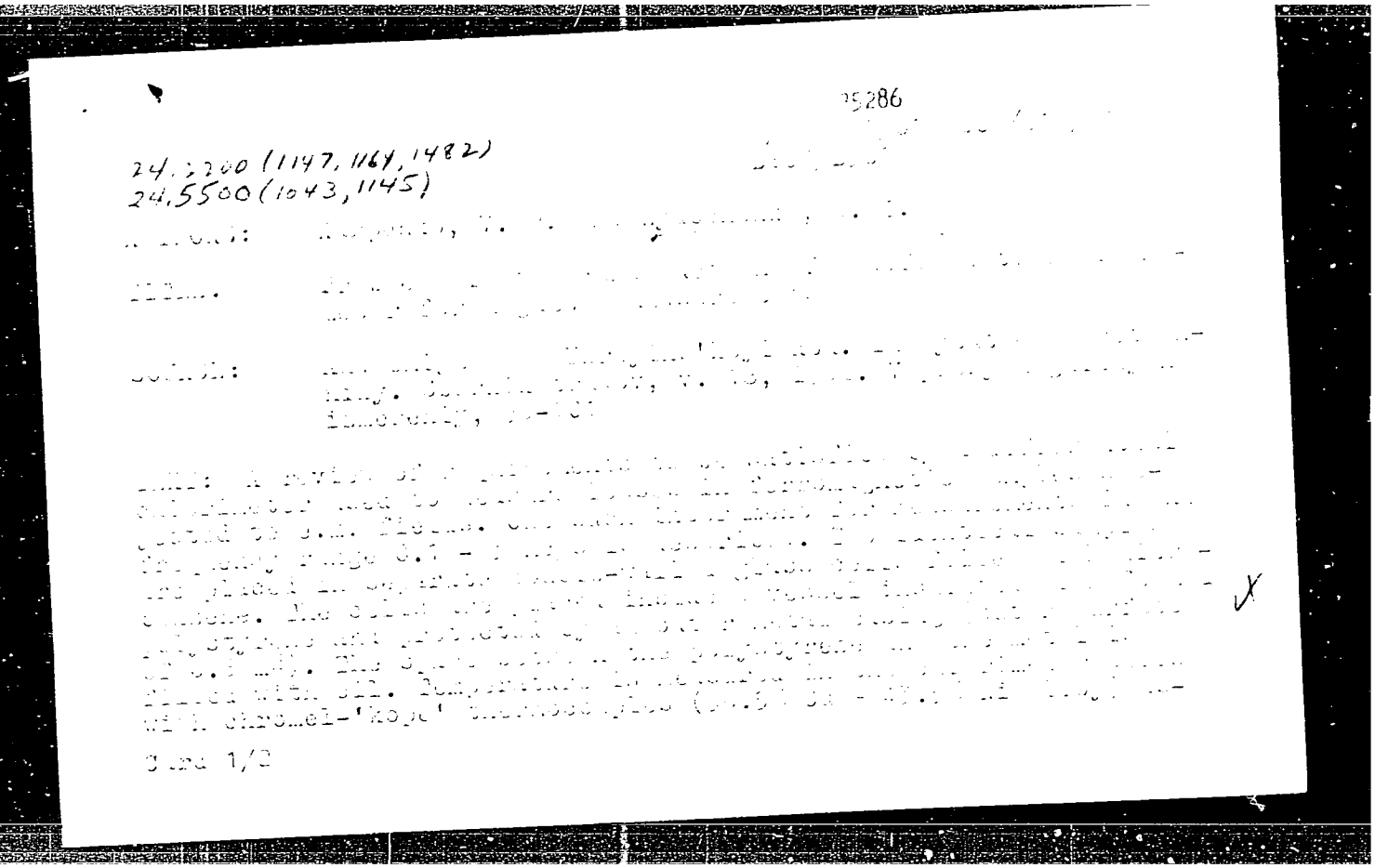
Card 6/6 JP/gmr 11-23-59



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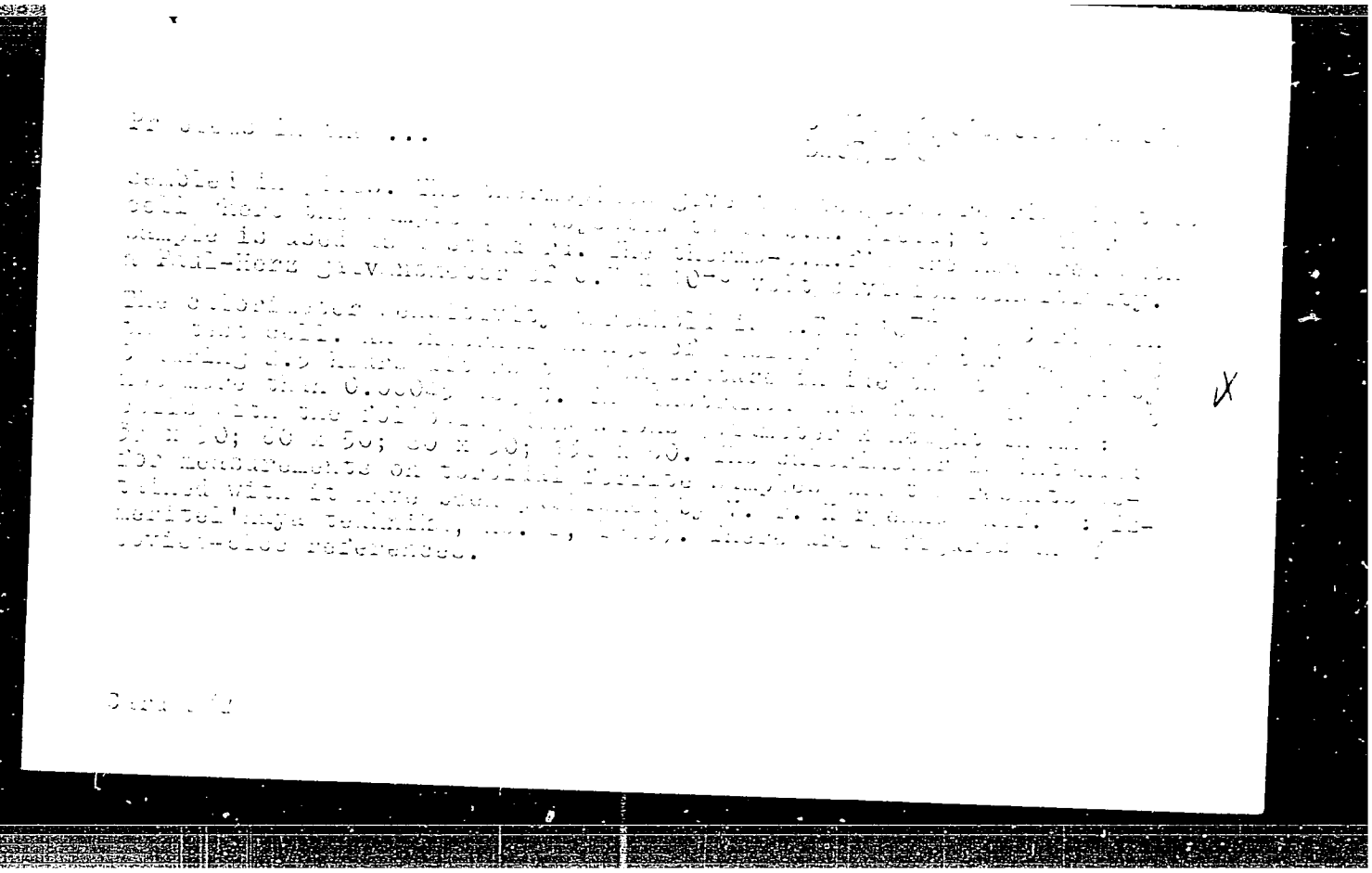

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TITLE: [illegible]

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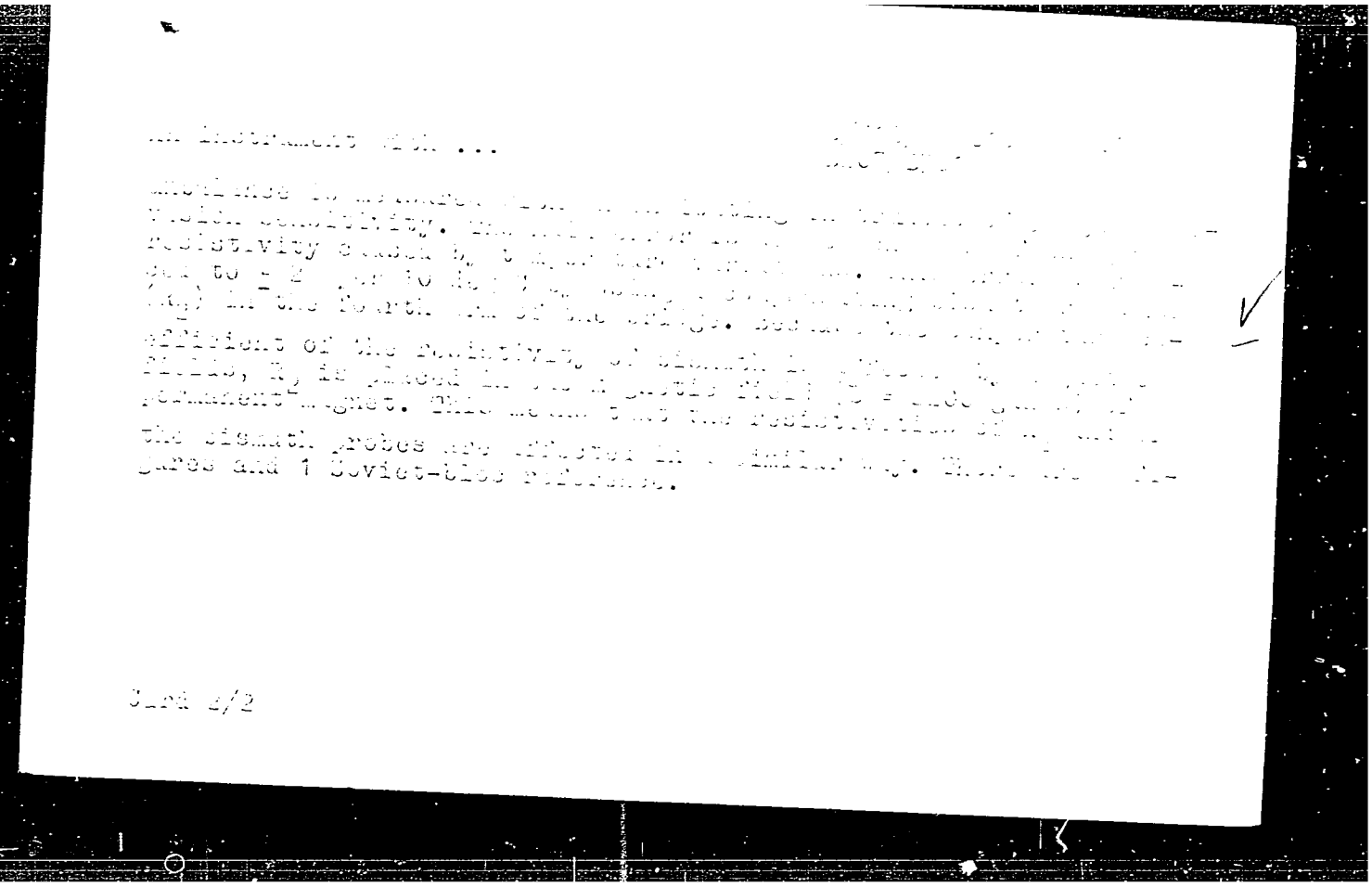
Card 1/2



Lynbchenko, J. S.

23801

16.3400

S/020/61/138/001/005/023
C 111/ C 222

AUTHOR: Lynbchenko, J. S.

TITLE: Newton's method as a basis for solving approximately the boundary value problem for a non-linear ordinary second order differential equation involving a small parameter in the higher derivative term

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 138, no. 1, 1961, 39-42

TEXT: On $[0,1]$ the author considers the boundary value problem

$$\varepsilon \frac{d}{dt}\left[f(t)\frac{dx}{dt}\right] - \varphi(x,t) = 0 \qquad (1)$$

$$x(0) = \alpha \,, \quad x(1) = \beta$$

where $\varphi(u,t)$ is continuous and has a continuous second derivative with respect to u for $0 \leq t \leq 1$, $|u - x_0(t)| \leq d$; $f(t)$ is two times continuously differentiable, strongly positive on $[0,1]$. As an initial approximation the a thor takes the two times continuously differen-

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Predstavleno akademikom S.L. Sobolevym

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C 111/ C 222

Newton's method as a basis for ...

triable function $x_0(t,\varepsilon)$

$$x_0(t) = \begin{cases} \bar{x}(t) & \text{on } [\varepsilon, 1-\varepsilon] \\ \bar{x}_0(t) & \text{on } [0, \varepsilon] \cup [1-\varepsilon, 1] \end{cases}$$

where $\bar{x}(t)$ is the solution of (1) for $\varepsilon = 0$, and $\bar{x}_0(t)$ is a two times continuously differentiable function which satisfies the boundary conditions of (1).

For the application of the Newton's method (1) is understood as a functional equation in the space $x = c^2$ of the two times continuously differentiable functions satisfying the boundary conditions with the norm

$$\|x\| = \max_{t\in[0,1]} \left| \varepsilon^2 \frac{d}{dt}\left[f(t) \frac{dx}{dt} \right] \right| + \max_{t\in[0,1]} |x(t)| \qquad (2)$$

where $\varepsilon > 0$ is determined later.

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S/020/61/138/001/005/023
C 111/ C 222

Newton's method as a basis for ...

As the space y the author takes the space C of functions continuous on $[0,1]$ with $\|y\| = \max_{t \in [0,1]} |y(t)|$.

Let the operation $\mathcal{P}$ be defined by

$$y = \mathcal{P}(x),\ y(t) = \varepsilon^2 \frac{d}{dt}\left[f(t)\frac{dx}{dt}\right] - \psi(x(t),t) \qquad (3)$$

$\mathcal{P}$ maps the sphere $\Omega_\delta : \|x - x_0\| \leq \delta$ into the space C and has continuous first and second derivatives on Ω_δ, where

$$\mathcal{P}'(z)(\Delta x)(t) = \varepsilon^2 \frac{d}{dt}\left[f(t)\frac{d(\Delta x)}{dt}\right] - \psi'_u(z(t),t)\,\Delta x(t) \qquad (4)$$

so that the element $\Delta x = \Gamma_c(y)$ is a solution of

$$\varepsilon^2 \frac{d}{dt}\left[f(t)\frac{d(\Delta x)}{dt}\right] - \psi'_u(x_0(t),t)\,\Delta x = y(t); \qquad (6)$$
$$\Delta x(0) = 0,\ \Delta x(1) = 0$$

Card 3/3

Newton's method as a basis for ...

Putting $\Delta x = u(t)/\sqrt{f(t)}$ then the homogeneous equation (6) obtains the form

$$\varepsilon^2 u''(t) + [q^2(t) + \varepsilon^2 r(t)]u(t) = 0 \qquad (7)$$

where

$$q^2(t) = \frac{\Psi'_u(x_0(t),t)}{f(t)}, \quad r(t) = \frac{f''(t)}{2f(t)} - \frac{f'^2(t)}{4f^2(t)} \qquad (8)$$

The approximate solution of (7) up to magnitudes $O(\varepsilon^3)$ reads

$$u(t) = \frac{c_1}{\sqrt{q(t)}} \exp\left(\frac{i}{\varepsilon}\int_0^t q(\tau)d\tau\right) + \frac{c_2}{\sqrt{q(t)}} \exp\left(-\frac{1}{\varepsilon}\int_0^t q(\tau)d\tau\right). \qquad (9)$$

Now the author defines a linear operation Γ neighboring to

Card 4/3

23801
S/020/61/138/001/005/023
C 111/ C 222

Newton's method as a basis for ...

$\Gamma_o = [\varphi'(x_o)]^{-1}$.

The Green's function of the operator for

$$\frac{d}{dt}\left[f(t)\frac{d(\Delta x)}{dt}\right] - \varphi'_u(x_o(t),t)\Delta x$$

for $\Delta x(0) = \Delta x(1) = 0$ has the form

$$G(t,s) = -\frac{\varepsilon f(0)}{2}\left[\exp\left(\frac{1}{\varepsilon}\int_0^t\left(\frac{\Psi'_u}{f}\right)^{1/2}d\tau\right) - \exp\left(-\frac{1}{\varepsilon}\int_0^t\left(\frac{\Psi'_u}{f}\right)^{1/2}d\tau\right)\right]\times$$

$$\times\left[\exp\left(-\frac{1}{\varepsilon}\int_0^s\left(\frac{\Psi'_u}{f}\right)^{1/2}d\tau\right) - \exp\left(-\frac{2}{\varepsilon}\int_0^1\left(\frac{\Psi'_u}{f}\right)^{1/2}d\tau\right)\exp\left(\frac{1}{\varepsilon}\int_0^s\left(\frac{\Psi'_u}{f}\right)^{1/2}d\tau\right)\right]\times$$

$$\times\left\{[\Psi'_u(x_0,t)\,f(t)]^{1/4}[\Psi'_u(x_0,s)\,f(s)]^{1/4}\left[1-\exp\left(-\frac{2}{\varepsilon}\int_0^1\left(\frac{\Psi'_u}{f}\right)^{1/2}d\tau\right)\right]\right\}^{-1}$$

Card 5/3

Newton's method as a basis for....

for $0 \leqslant t \leqslant s$; (10)

$$G(t, s) = -\frac{ef(0)}{2}\left[\exp\left(-\frac{1}{e}\int_0^t\left(\frac{\Psi'_u}{l}\right)^{1/2}d\tau\right) - \exp\left(-\frac{2}{e}\int_0^1\left(\frac{\Psi'_u}{l}\right)^{1/2}d\tau\right)\times\right.$$

$$\left.\times\exp\left(\frac{1}{e}\int_0^t\left(\frac{\Psi'_u}{l}\right)^{1/2}d\tau\right)\right]\left[\exp\left(\frac{1}{e}\int_0^s\left(\frac{\Psi'_u}{l}\right)^{1/2}d\tau\right) - \exp\left(-\frac{1}{e}\int_0^s\left(\frac{\Psi'_u}{l}\right)^{1/2}d\tau\right)\right]\times$$

$$\times\left\{[\Psi'_u(x_0, t)f(t)]^{1/4}[\Psi'_u(x_0, s)f(s)]^{1/4}\left[1 - \exp\left(-\frac{2}{e}\int_0^1\left(\frac{\Psi'_u}{l}\right)^{1/2}d\tau\right)\right]\right\}^{-1}$$

for $s \leqslant t \leqslant 1$.

It holds the estimation

Card 6/3

Newton's method as a basis for ...

$$\max_{t,s\in[0,1]}|G(t,s)|\leqslant$$

$$\leqslant M\varepsilon\left|\frac{\exp\left(-\frac{2}{\varepsilon}\int_t^1\left(\frac{\Psi_u'}{f}\right)^{1/2}d\tau\right)+\exp\left(-\frac{2}{\varepsilon}\int_0^t\left(\frac{\Psi_u'}{f}\right)^{1/2}d\tau\right)-\exp\left(-\frac{2}{\varepsilon}\int_0^1\left(\frac{\Psi_u'}{f}\right)^{1/2}d\tau\right)-1}{1-\exp\left(-\frac{2}{\varepsilon}\int_0^1\left(\frac{\Psi_u'}{f}\right)^{1/2}d\tau\right)}\right|\leqslant$$

$$\leqslant M\varepsilon, \qquad (17)$$

where

$$M=\frac{f(0)}{2}\max_{t\in[0,1]}|(\Psi_u' f)^{-1/2}|.$$

Then

$$\Gamma \leq (M\varepsilon + \lambda^{-}) \qquad (18)$$

where $\theta = \max_{t=0,1}$ [illegible] $_u(x_o(t),t \cdot \max_{t,s=[0,1]} G(t,s) + 1$.

Card 7/9

Newton's method as a basis for ...

The author still gives estimation, e. g.

$$P''(x) \leq \ldots \quad P''(x) \leq (M_{\ldots} + \ldots) \max_{t \in [0,1]} \ldots (x,t) \qquad (20)$$

$$= K(M_{\ldots} + \ldots)$$

where $K = \max_{t \in [0,1]} \ldots (x(t),t) \ldots (x - \ldots)$.

The conditions for the solvability of (1) read

$$h = \frac{2MQK \ldots^2 (M_{\ldots} + \ldots)}{1 - K \ldots (M_{\ldots} + \ldots)^2} \leq \frac{1}{2}; \qquad K \ldots (M_{\ldots} + \ldots) < 1 \qquad (22)$$

Card 8/9

23801

S/020/61/138/001/005/023
C 111/ C 222

Newton's method as a basis for ...

where

$$Q = \max_{t \in [C,1]} \left| \int_C^t \frac{d}{dt} \left[f(t) \frac{d\bar{x}_0(t)}{dt} \right] - F(\bar{x}_0(t), t) \right| .$$

The author mentions L. V. Kantorovich. He thanks S. N. Slugin for advices. There are 2 Soviet-bloc references.

PRESENTED: December 6, 1960, by S. L. Sobolev, Academician

SUBMITTED: November 11, 1960

Card 9/9

S/085/63/000/002/002/004 D251/D308

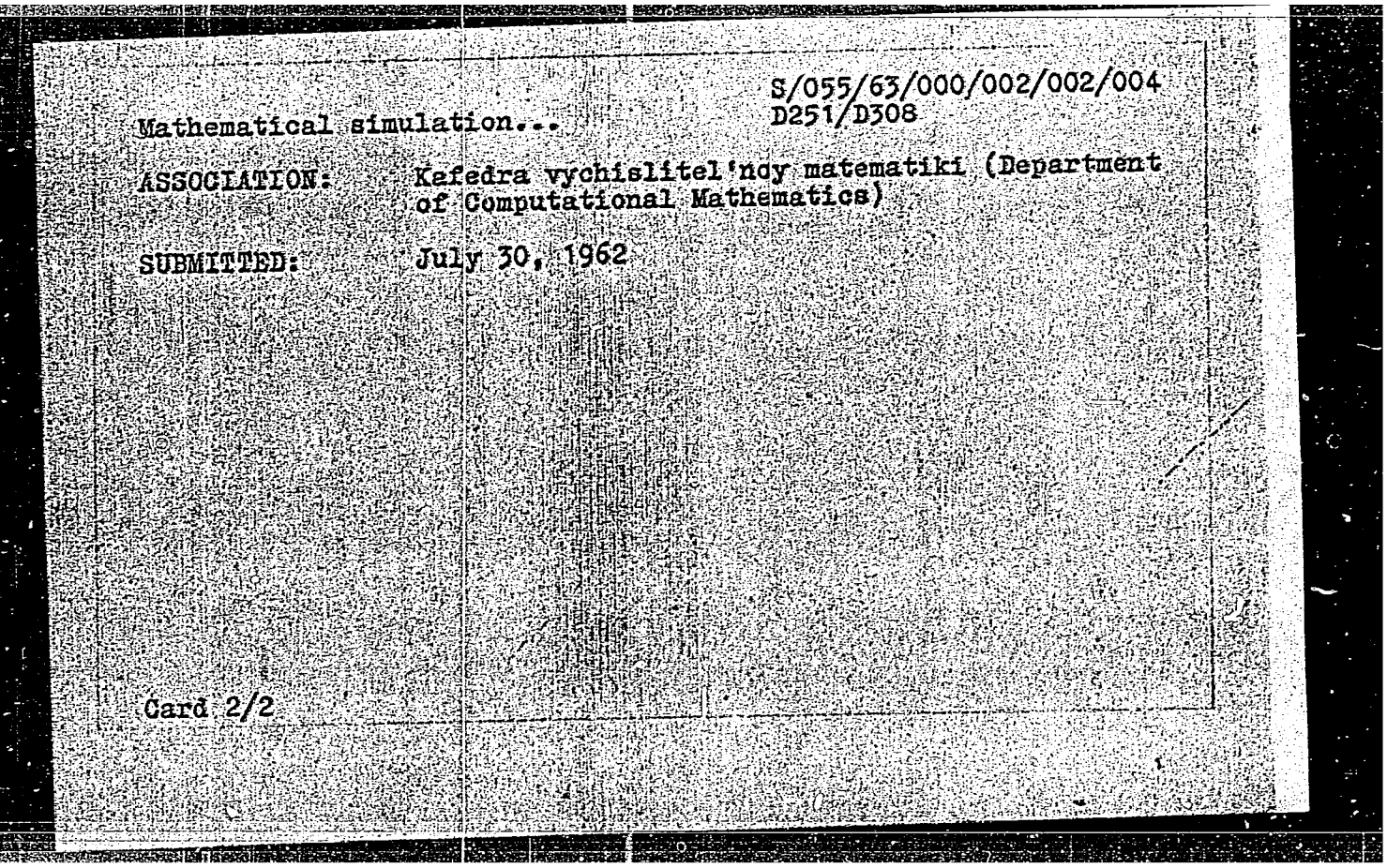
AUTHORS: Lyubchenko, I. S., and Mayzlin, I. Ye.

TITLE: Mathematical simulation of a technological process on an electronic digital computer

PERIODICAL: Moscow. Universitet. Vestnik. Seriya I. Matematika, Mekhanika, no. 2, 1963, 37-43

TEXT: The authors consider a scheme for simulating on an electronic computer the working of a production line making thermo-electric heaters. The flow diagram of the actual process is considered, and the results of applying the method of statistical testing are indicated. The required algorithm is given in the form of a bloc-diagram comprising 190 blocs; the state of all units of the production line is analyzed at intervals of time Δt. It is supposed that changes may take place in this state at the instant of time under consideration. There are 2 figures.

Card 1/2



S/055/63/000/002/002/004
D251/D308

Mathematical simulation...

ASSOCIATION: Kafedra vychislitel'noy matematiki (Department of Computational Mathematics)

SUBMITTED: July 30, 1962

Card 2/2

16.8000

S/020/63/148/003/009/037
B112/B186

AUTHORS: Lyubchenko, I. S., Mayzlin, I. Ye.

TITLE: A method of constructing an algorithm simulating a given production process

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 3, 1963, 538-540

TEXT: The following is the logical scheme for the work of a conveyor I which transports workpieces of a given type to n entrance chutes, which in turn convey them to m workbenches where they undergo processing and are passed on to conveyer II via n collection chutes:

Card 1/3

A method of constructing an ...

$$\overset{58}{\downarrow} H_0 P_1 (t_l^r < t) \overset{6}{\uparrow} P_2 (M_l = 0) \overset{4}{\uparrow} A_3 (t_l^r,\ M_l) \overset{5}{\uparrow};\quad \overset{2}{\downarrow} A_3 (M_l) \overset{3}{\downarrow} [u^k \to u^{k+1} (k \geqslant 1),$$

$$0 \to u^1]_5 \overset{1}{\downarrow} (1 \to j]_6 \overset{34}{\downarrow} 3_7 (j)\, P_8 (u^{k_l} = j) \overset{15}{\uparrow} P_9 (N_l < N_l^0) \overset{12}{\uparrow} A_{10} (N_l) [0 \to u^k]_{11} \overset{15}{\uparrow};$$

$$\overset{9}{\downarrow} P_{12} (j < n) \overset{14}{\uparrow} [j+1 \to u^{k_l}]_{13} \overset{15}{\uparrow};\quad \overset{12}{\downarrow} A_{14} \overset{8,11,13}{\downarrow} (1 \to i)_{15} \overset{22}{\downarrow} P_{16} (t_{l,l}^r = t) \overset{21}{\uparrow}$$

$$P_{17} (\pi_{l,l} = 1) \overset{21}{\uparrow} P_{18} (N_{n+l} \leqslant N_{n+l}^0 - q + 1) \overset{20}{\uparrow} A_{19} (N_{n+l}) \overset{21}{\uparrow};\quad \overset{18}{\downarrow} A_{20} (t_{l,l}^r) \overset{16,17,19}{\downarrow}$$

$$F_{21} (i)\, P_{22} (i = m+1) \overset{16}{\uparrow} O_{23} (i)\, P_{24} (N_l \geqslant q) \overset{32}{\uparrow} \overset{29}{\downarrow} P_{25} (\min_i t_{l,l}^r \leqslant t) \overset{32}{\uparrow} A_{26} (i_0)$$

$$P_{27} (M_{i_0,l} = 0) \overset{30}{\uparrow} A_{28} (t_{i_0,l}^r,\ M_{i_0,l}) [0 \to \pi_{i_0,l}]_{29} \overset{25}{\uparrow};\quad \overset{27}{\downarrow} A_{30} (t_{i_0,l}^r,\ M_{i_0,l},\ N_l) [1 \to$$

$$\to \pi_{i_0,l}]_{31} \overset{24,26}{\downarrow} 3_{32} (j)\, F_{33} (j)\, P_{34} (j = n+1) \overset{7}{\uparrow} O_{35} (j)\, P_{36} (v^{l_{2n+1}} = 0) \overset{53}{\uparrow} P_{37} (t_{ll}^r < t) \overset{56}{\uparrow}$$

$$P_{38} (M_{ll} = 0) \overset{40}{\uparrow} A_{39} (t_{ll}^r,\ M_{ll}) \overset{41}{\uparrow};\quad \overset{38}{\downarrow} A_{40} (M_{ll}) \overset{39}{\downarrow} [v^l \to v^{l+1} (l \geqslant 1),\ 0 \to v^1]_{41}$$

$$A_{42} (\tau)\, P_{43} (\tau = \nu) \overset{43}{\uparrow} [0 \to \tau]_{44} (1 \to j]_{45} \overset{50}{\downarrow} P_{46} (N_{n+l} \geqslant 1) \overset{49}{\uparrow} A_{47} (N_{n+l}) [1 \to v^{l_{n+l}}]_{48}$$

$$\overset{46}{\downarrow} F_{49} (j)\, P_{50} (j = n+1) \overset{46}{\uparrow} O_{51} (j) \overset{43}{\downarrow} P_{52} (v^{l_{2n+1}} = 1) \overset{56}{\uparrow} \overset{36}{\downarrow} P_{53} (N_{2n+1} < N_{2n+1}^0) \overset{56}{\uparrow}$$

$$A_{54} (N_{2n+1}) [0 \to v^{l_{2n+1}}]_{55} \overset{37,52,53}{\downarrow} H_{56} A_{57} (t)\, P_{58} (t \geqslant T_0) \overset{0}{\uparrow} Я_{59}.$$

Card 2/3

A method of constructing an ... S/020/63/148/003/009/037
B112/B186

This was simulated on an ETsM computer. This algorithm makes it possible to determine the most efficient installation of a production plant and to calculate the production possibilities by using the parameter values given and by taking random factors into account, as well as to calculate parameter deviations influencing the efficiency factors of the plant. There is 1 figure.

PRESENTED: August 3, 1962, by A. I. Berg, Academician

SUBMITTED: July 26, 1962

Card 3/3

Lyubchenko, I.S.

AID Nr. 966-14 14 May

CALCULATION OF A TURBINE STAGE (USSR)

Lyubchenko, I. S. Izvestiya vysshikh uchebnykh zavedeniy. Aviatsionnaya tekhnika, no. 1, 1963, 80-88. S/147/63/000/001/009/020

A simple method is given for design calculation of a modern high-temperature aircraft turbine stage with a conical meridional flow and variable inlet parameters. The same assumptions are made as in hypothetical cylindrical flow in regard to constant heat capacities, radial displacement of the flow line, variation of the velocity coefficient, and the effect of end losses. Equations are deduced for the motion of gases in the blade clearance, and parameters are established for the outlets from the nozzles and the rotor. A calculation method for checking a turbine stage is also given, by means of which all parameters can be determined on the basis of the given turbine-stage geometry. [AC]

Card 1/1

blades 21

SOURCE: Moscow. Universitet, Vestnik. Seriya 1. Matematika, mekhanika, no. 1, 1965, 52-60

TOPIC TAGS: gas turbine, cooled blade, noncooled blade, blade temperature, turbine design 26

ABSTRACT: The authors present an approximate solution for temperature fields of cooled and noncooled turbine blades in gas turbines. In noncooled blades the heat transfer occurs solely through the contact of the blades with the turbine disk crown. It is assumed that the heat transfer is constant along the contour of each section and consequently that the temperature is constant in each cross section. Formulas are derived, and the second approximation of the asymptotic solution is obtained. For the air-cooled blade, equations of the heat balance for the blade and the cooling air, expressions for the boundary conditions of the blade temperature,

Card 1/2

ACCESSION NR: AP5007227

and the heat transfer coefficient from the blade to the cooling air are established, and the first approximation of the asymptotic solution obtained. Orig. art. has: 27 formulas. [AC]

ASSOCIATION: Kafedra matematiki fizicheskogo fakul'teta Moskovskogo gosudarstvennogo universiteta (Chair of Mathematics, Physics Department, Moscow State University)

SUBMITTED: 28Feb63 ENCL: 00 SUB CODE: PR

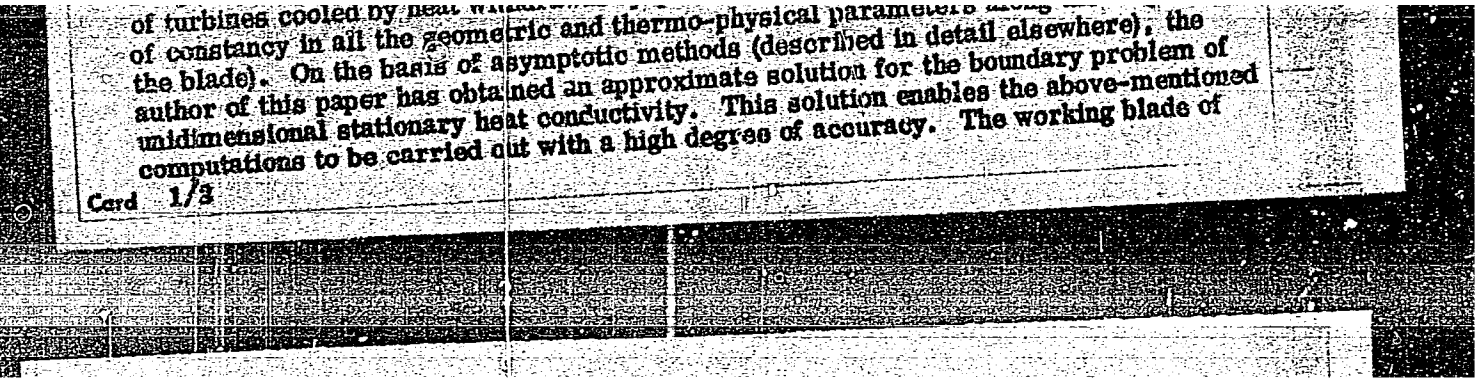
NO REF SOV: 012 OTHER: 000 ATD PRESS: 3208

TITLE: An asymptotic [illegible] blades of gas turbines

SOURCE: IVUZ. Aviatsionnaya tekhnika, no. 2, 1965, 92-102

TOPIC TAGS: gas turbine, asymptotic equation, turbine blade heat calculation, heat emission coefficient, heat exchange, turbine blade cooling, blade temperature

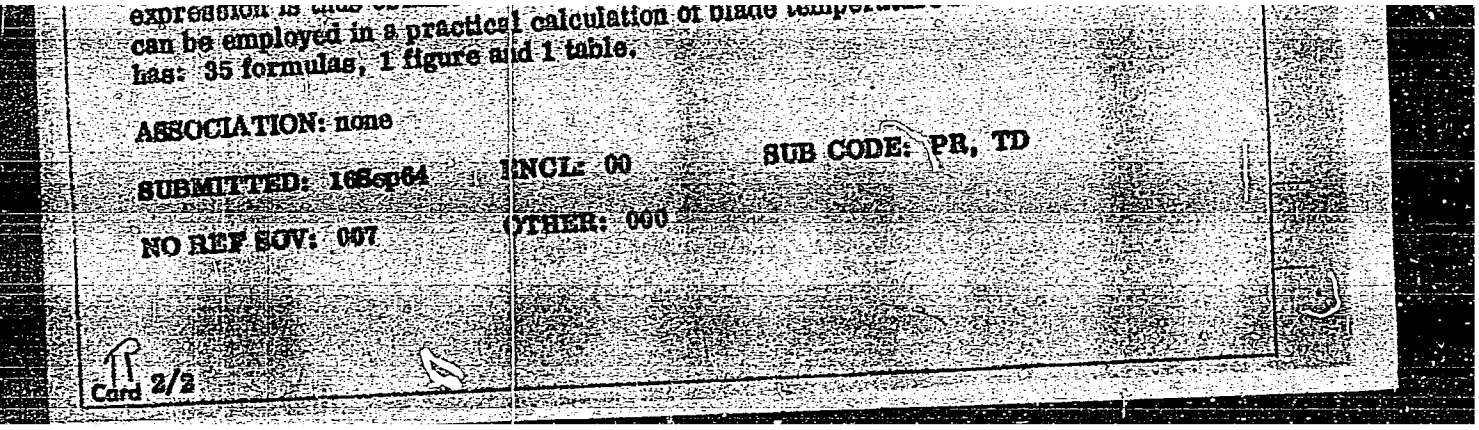
ABSTRACT: A great deal of experimental and theoretical material has now been accumulated in the practice of turbine construction, making it possible to calculate reliably the heat emission factor from the gas to the blade. There is, however, no simple engineering method for computing the temperature field of the working blades of turbines cooled by heat withdrawal by-passing the disk (with allowance for the lack of constancy in all the geometric and thermo-physical parameters along the length of [illegible] methods (described in detail elsewhere), the [illegible]



of turbines cooled by heat [illegible] of constancy in all the geometric and thermo-physical parameters [illegible] the blade). On the basis of asymptotic methods (described in detail elsewhere), the author of this paper has obtained an approximate solution for the boundary problem of unidimensional stationary heat conductivity. This solution enables the above-mentioned computations to be carried out with a high degree of accuracy. The working blade of

Card 1/3

a turbine in a non-uniform temperature gas field is considered, on the assumption that the blade temperature through the section and along the profile contour (at any radius) is held constant, and that the heat emission factor along the contour of each cylindrical section is also constant. The heat balance equation is converted into a differential equation and boundary conditions are assigned. Formulae are derived for the solution of the boundary problem and, in the second section of the article, an [illegible] this solution in an asymptotic form. A final asymptotic [illegible] illustrating how it



expression is [illegible] calculation of blade [illegible]
can be employed in a practical
has: 35 formulas, 1 figure and 1 table.

ASSOCIATION: none

SUBMITTED: 16Sep64 ENCL: 00 SUB CODE: PR, TD

NO REF SOV: 007 OTHER: 000

Card 2/2

L 01002-66 EPA/EWT(m)/EWP(w)/EWP(f)/EPF(n)-2/EWP(v)/T-2/EWP(k)/ETC(m) WW/EM

ACCESSION NR: AP5020642 UR/0147/65/000/003/0098/0107
62.135:536.12

AUTHOR: Lyubchenko, I. S. 44,55

31
B

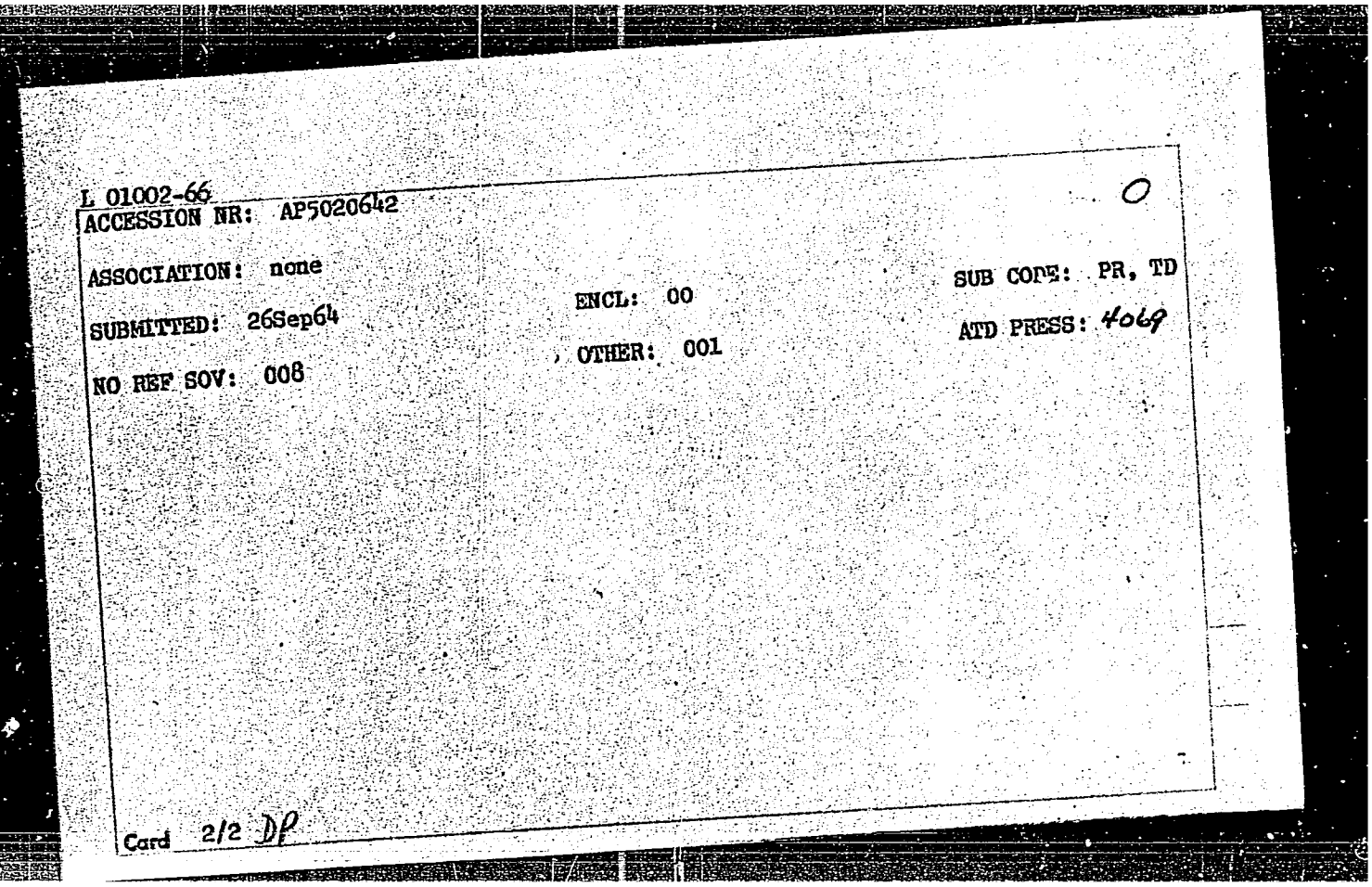
TITLE: Temperature field determination of longitudinally air cooled blades based on an asymptotic analysis method

SOURCE: IVUZ. Aviatsionnaya tekhnika, no. 3, 1965, 98-107

TOPIC TAGS: gas turbine, asymptotic solution, blade cooling, turbine blade
23,44,55

ABSTRACT: Using previously developed asymptotic methods, general formulas are derived for calculating the temperature distribution along the rotor-blade length, while taking into account the variations of all the factors entering into the differential equation describing the heat-transfer process. It is assumed that the gas temperature along the contour of each blade cross section, the temperature of the blade cross section itself and of the contour of the profile remain constant, and that the heat-transfer coefficients between the gas, the blade, and the coolant vary along the length of the blade, but are equal along the contour in each cross section. The use of the derived formulas is illustrated by specific examples. Orig. art. has: 33 formulas and 2 figures. [AC]

Card 1/2



L 01002-66
ACCESSION NR: AP5020642 O

ASSOCIATION: none

SUBMITTED: 26Sep64 ENCL: 00 SUB CODE: PR, TD

NO REF SOV: 008 OTHER: 001 ATD PRESS: 4069

Card 2/2 DP

L 00564-66 EWT(m)/EWP(w)/EWP(f)/EWP(v)/T-2/EWP(k)/ETC(m) WW/EM

ACCESSION NR: AR5019364 UR/0124/65/000/007/B090/B090

55
B

SOURCE: Ref. zh. Mekhanika, Abs. 7B647

AUTHOR: Lyubchenko, I. S.

TITLE: An asymptotic method for calculating temperature fields in blades of air-cooled aircraft gas turbines

CITED SOURCE: Dokl. 3-y Sibirsk. konferentsii po matem. i mekhan., 1964, Tomsk, Tomskiy un-t, 1964, 326-328

TOPIC TAGS: aircraft turbine, aircooled gas turbine, turbine blade temperature, asymptotic calculation method

TRANSLATION: Calculation of the temperature in a hollow blade cooled by an external flow of air is reduced to solving a system of two common differential equations relative to blade and air temperatures. The equations depend on small parameters, i.e. the inverse value of the Biot number for the gas side $\lambda : (\varkappa_2 1)$ and the Biot number on the air side $\varkappa_1 : \lambda$. Here the author employs an approach evolved by M. I. Vishik and L. A. Lyusternik relative to an asymptotic method of solving differential equations with small

Card 1/2

L 00564-66
ACCESSION NR: AR5019364

parameters (Usp. matem. n., 1957, 12, No. 5 (77)). The problem is reduced to a system of integral equations solved by successive approximation. L. A. Dorfman

SUB CODE: PR, ME ENCL: 00

Card 2/2

ACC NR: AR6035013 SOURCE CODE: UR/0044/66/000/008/B048/B048

AUTHOR: Lyubchenko, I. S.

TITLE: Solvability of the boundary-value problem for a system of ordinary differential equations with small parameters

SOURCE: Ref. zh. Matematika, Abs. 8B226

REF SOURCE: Sb. Materialy 2-y konferentsii molodykh nauchn. rabotn. Kazani. Sekts. fiz.-tekhn. i mekhan.-matem. Kazan', 1965, 70-80

TOPIC TAGS: ordinary differential equation, boundary value problem, solution existence, solution uniqueness

ABSTRACT: An analysis is made of the boundary-value problem

$$\mu^s \frac{d}{dx}\left[p(x)\frac{dz}{dx}\right] = P(z, y, x),$$

$$\frac{dy}{dx} = \varepsilon f(z, y, x),$$

$$0 < x < 1, \quad z|_{x=0} = \beta_0, \quad z|_{x=1} = \beta_1, \quad y|_{x=0} = \theta,$$

where $\theta, \beta_0, \beta_1 > 0 (\beta_0 < \beta_1)$, μ^s and ε are small positive parameters.

UDC: 517.917

Card 1/2

ACC NR: AR6035013

The asymptotic nature of the solution of this problem is developed, the theorem of existence and uniqueness is proved, and the errors of approximate formulae are estimated. Some ideas of A. B. Vasil'yeva and her students were used in constructing the solution. The functional variant of the Newton method is applied in proving both the existence and uniqueness. It is pointed out that the problem investigated is of interest from a practical standpoint. For instance, it arises in studies of the temperature field in the vane of a turbine with internal cooling in the longitudinal direction. V. Volosov. [Translation of abstract] [DW]

SUB CODE: 12/

Card 2/2

TAKHTAY, I.I.; LYUBCHENKO, L.I.

Accelerated method for determining total soil phosphorus.
Pochvovedenie no.3:98-100 Mr '61. (MIRA 14:3)

1. Kamenets-Podol'skiy sel'skokhozyaystvennyy institut.
(Soils—Phosphorus content)

LYUBCHENKO, L.N. (Moskva V-313, Leninskiy prospekt, d.89, kv.298)

Examination of the external respiration and gas composition of the blood in tetralogy of Fallot. Grud. khir. 6 no.2:72-77 Mr-Ap '64. (MIRA 18:4)

1. Fakul'tetskaya khirurgicheskaya klinika (dir. - akademik A.N. Bakulev) II Moskovskogo meditsinskogo instituta imeni Pirogova (rukovoditel' - akademik A.N.Bakulev) AMN SSSR, Moskva.

LOMAKIN, V.P., kand. tekhn. nauk; KAMINSKAYA, D.A., kand. tekhn. nauk; MAKAROV, A.V., inzh.; LYUBCHENKO, L.P., inzh.

Analytic investigation of dynamic characteristics of the drive of excavator turn gear. Izv. vys. ucheb. zav.; mashinostr. no.9:113-118 '65. (MIRA 18:11)

5.3830

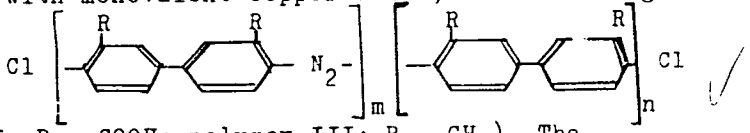
S/190/60/002/010/009/026
B004/B054

AUTHORS: Liogon'kiy, B. I., Lyubchenko, L. S., Berlin, A. A., Blyumenfel'd, L. A., and Parini, V. P.

TITLE: Polymers With Conjugate Bonds and Heteroatoms in the Conjunction Chain. XI. The Spectra of Electron Paramagnetic Resonance of Linear Aromatic Polymers

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 10, pp. 1494-1499

TEXT: In previous papers (Refs. 1, 2), the authors obtained aromatic polymers by reaction of bis-diazotized benzidine, benzidine-3,3'-dicarboxylic acid, and o-toluidine with monovalent copper salts; the following structural formula is given:



(polymer I: R = H; polymer II: R = COOH; polymer III: R = CH_3). The electron paramagnetic spectra (epr) were taken (Figs. 1-3) of these poly-

Polymers With Conjugate Bonds and Heteroatoms in the Conjunction Chain. XI. The Spectra of Electron Paramagnetic Rescnance of Linear Aromatic Polymers

S/190/60/002/010/009/026
B004/B054

mers and the copolymer from I and p-diethinyl benzene, and the concentration of the nonpaired electrons was found to be 10^{18} - 10^{19} in 1 g of substance (Table) by comparison with the epr spectrum of diphenyl-picryl hydracyl as a standard. All epr spectra showed a signal with g-factor 2.00 which remains unchanged on heating to 300-350°C and cooling to 77°K, and is interpreted as a signal of the conjugate bonds. The broader epr signal, which is superposed to this signal in unheated samples, could not be analyzed because of the superposition, and is interpreted as a signal of less active, free radicals with localized free valency. The signal appearing additionally in the insoluble fraction with g-factor 2.05, which disappears on dissolution, is ascribed to low-molecular particles. The stability of the epr spectrum in the wide temperature range indicates the paramagnetic character of at least part of the polymer. There are 3 figures, 1 table, and 9 references: 8 Soviet and 1 US.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics of the AS USSR)

SUBMITTED: April 25, 1960

Card 2/2

BERLIN, A.A.; VONSYATSKIY, V.A.; LYUBCHENKO, L.S.

Effect of local activation. Izv.AN SSSR.Otd.khim.nauk no.7:1312 Jl '62. (MIRA 15:7)

1. Institut khimicheskoy fiziki AN SSSR.
(Paramagnetic resonance and relaxation) (Macromolecular compounds)

ACCESSION NR: AP4011500 S/0051/64/016/001/0155/0159

AUTHOR: Chetverikov,A.G.; Chernyakovskiy,F.P.; Blyumenfel'd,L.A.; Lyubchenko,L.S.; Moshkovskiy,Yu.Sh.

TITLE: Light induced paramagnetic centers in triphenylmethane dye crystals

SOURCE: Optika i spektroskopiya, v.16, no.1, 1964, 155-159

TOPIC TAGS: paramagnetic center, color center, photoreaction, triphenylmethane dye, brilliant green, malachite green, EPR, photocoloring, photobleaching

ABSTRACT: In recent years a number of investigators have reported observing the appearance of paramagnetic centers in pigment and dye crystals under the influence of illumination. The present paper gives the results of preliminary experiments on the influence of illumination as regards formation of paramagnetic centers in the crystals of some triphenylmethane dyes, namely, brilliant green (I), and two methylated derivatives of malachite green (II & III), synthesized by the Grignard reaction. The structural formulas of the investigated dyes are shown in the Enclosure. The EPR spectra were measured on an EPR-2 IKhF spectrometer; the absorption and reflection spectra on an SF-10 spectrophotometer. In agreement with the results of V.E.

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ACC.NR: AP4011500

Kholmogorov and D.N.Glebovskiy (Opt.i spektr.12,726,1962) and in contrast with the results of F.I.Chernyakovskiy,A.Ye.Kalmanson and L.A.Blyumenfel'd (Ibid.9,736,1960), the crystals of the investigated dyes precipitated from solution in the dark did not yield an EPR signal. EPR signals disappear upon illumination of the dye crystals with the light from a 3 watt incandescent lamp. It was found, in fact, that two types of paramagnetic centers form in dye I. Heating of the crystals results in fading of the EPR signal. In the course of the investigation it was also found that, in addition to formation of paramagnetic centers, illumination results in reversible change in the color of the dye. A tentative interpretation of the results is given, but thorough analysis must await completion of quantitative measurements which are now underway. Orig.art.has: 3 formulas and 3 figures.

ASSOCIATION: none

SUBMITTED: 15Apr63 DATE ACQ: 14Feb64 ENCL: 01

SUB CODE: PH NR REF SOV: 008 OTHER: 003

Card 2/3

BERLIN, A.A.; VONSYATSKIY, V.A.; LYUBCHENKO, L.S.

Electron paramagnetic resonance spectra (EPR) of some polynuclear aromatic hydrocarbons. Izv. AN SSSR Ser. khim. no.7:1184-1188 Jl '64. (MIRA 17:8)

1. Institut khimicheskoy fiziki AN SSSR.

L 6715-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RPL/AFWL/AS(mp)-2/RAEM(c)/SSD/ 69
ASD(a)-5/RAEM(i)/RSD(gs)/ESD(t) WW/JFW/RM 67
ACCESSION NR: AP4042208 S/0020/64/157/002/0381/0383

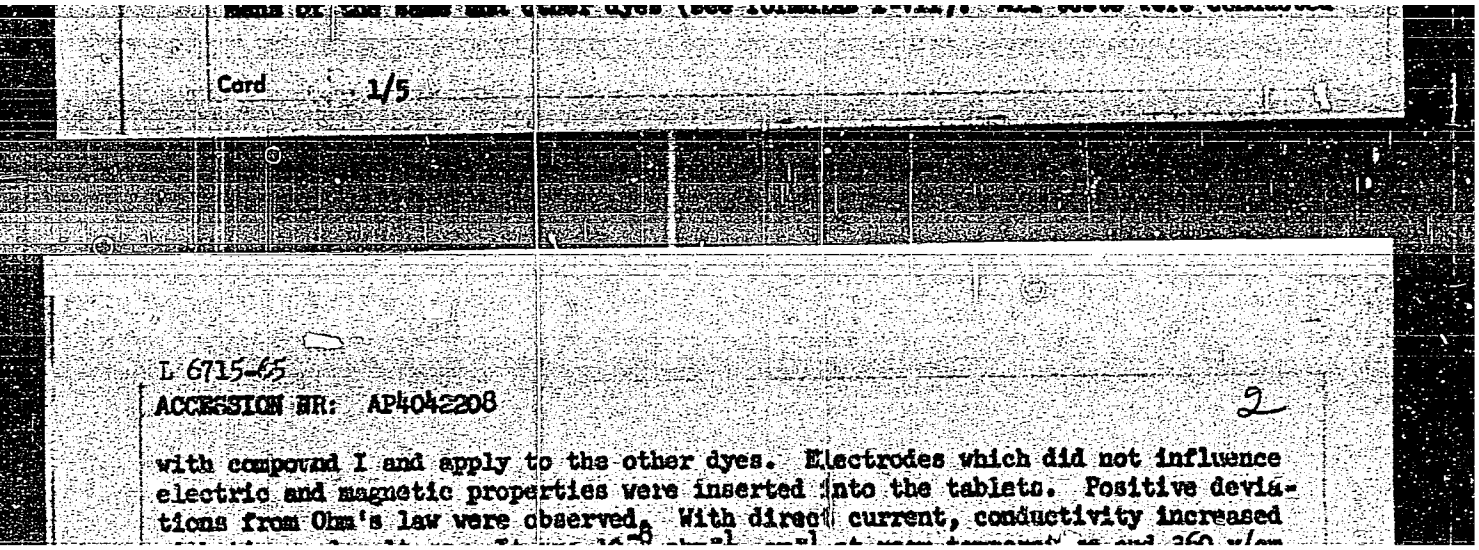
AUTHOR: Blyumenfel'd, L. A.; Gribanov, V. A./ Lyubchenko, L. S./ Chernyakovskiy, F. P./ Chetverikov, A. G.

TITLE: The appearance of paramagnetic centers and EMF during electrochemical reactions in polycrystals of triphenylmethane dyes 15

SOURCE: AN SSSR. Doklady*, v. 157, no. 2, 1964, 381-383

TOPIC TAGS: paramagnetic center, electromotive force, electrochemical reaction, triphenylmethane dye, polycrystal of triphenylmethane dye electron magnetic resonance, electron paramagentic resonance, Ohm's law, singlet, free radical, Curie law, triphenylmethane dye conductivity, solid triphenylmethane conductivity dependence

ABSTRACT: In continuation of earlier work which showed electron magnetic resonance (emr) signals in polycrystalline specimens of brilliant green subjected to artificial light, the authors describe some new electric and magnetic effects



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ACCESSION NR: AP4042208

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with compound I and apply to the other dyes. Electrodes which did not influence electric and magnetic properties were inserted into the tablets. Positive deviations from Ohm's law were observed. With direct current, conductivity increased

tions from Ohm's law were observed. With direct current, conductivity increased with time and voltage. It was 10^{-6} $ohm^{-1} \cdot cm^{-1}$ at room temperature and 360 v/cm. The current passing through the tablet gave rise to potentials of the same sign (much like charging an accumulator with reached e.g. 75 v with a 300 v current in a 0.15 cm thick tablet. A singlet epr (electron paramagnetic resonance) signal with g-factor appeared as the current passed through the tablet, indicating the appearance of free-radical/neutral compounds at the cathode. Its dynamics may be seen from Fig. 2 (encl.) Test showed the paramagnetic centers located close to the cathode. Increasing the temperature led to rapid disappearance of the signal upon discharge. Studies of this motion between 300 and 77 K showed that its intensity did not obey the Curie law; it coincided with the temperature dependency of the "narrow" epr light signal. Orig. art. has: 2 figures and 7 formulas.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Physical Chemistry, Academy of sciences, SSSR)

SUBMITTED: 24Feb64 ENCL: 02

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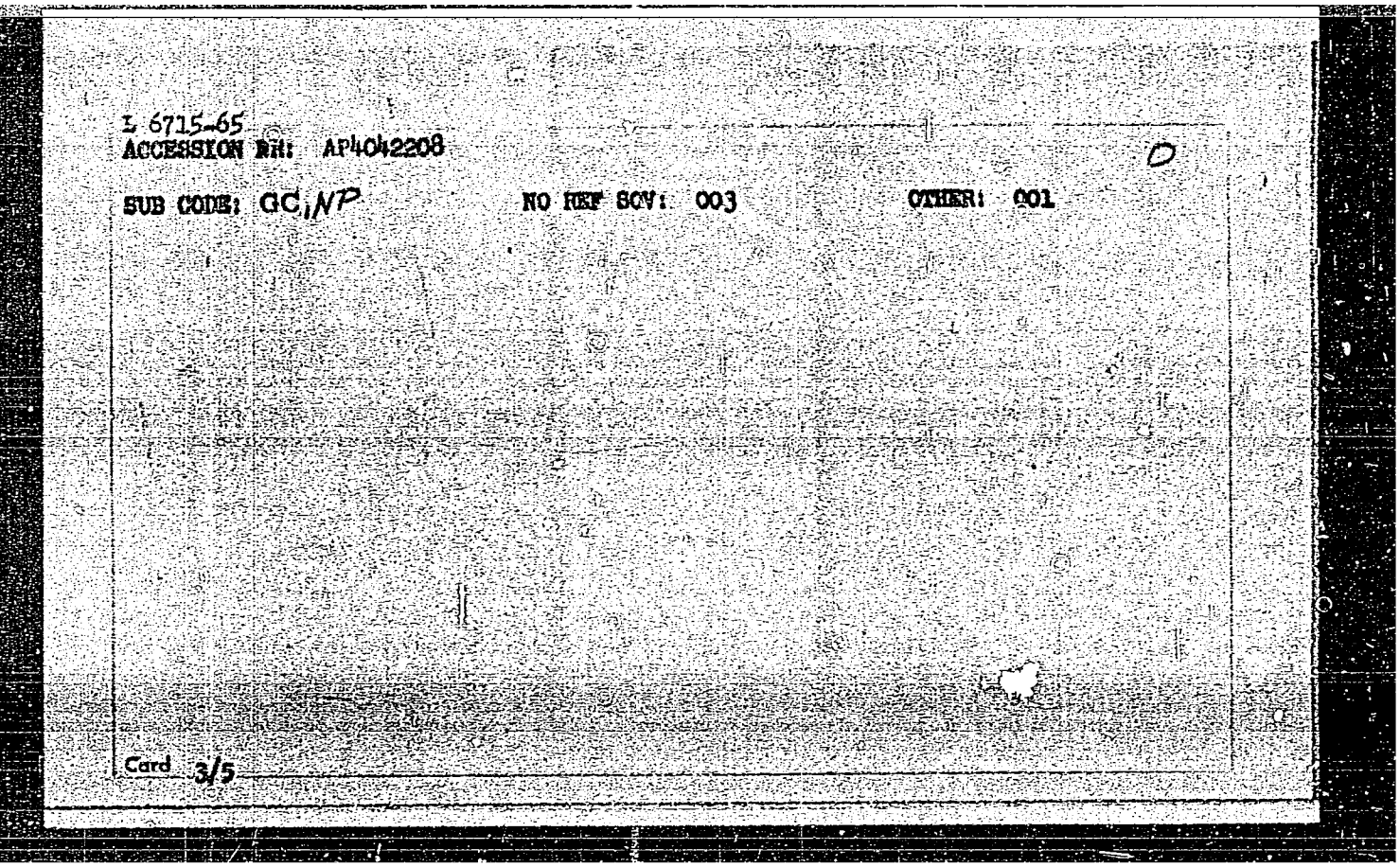
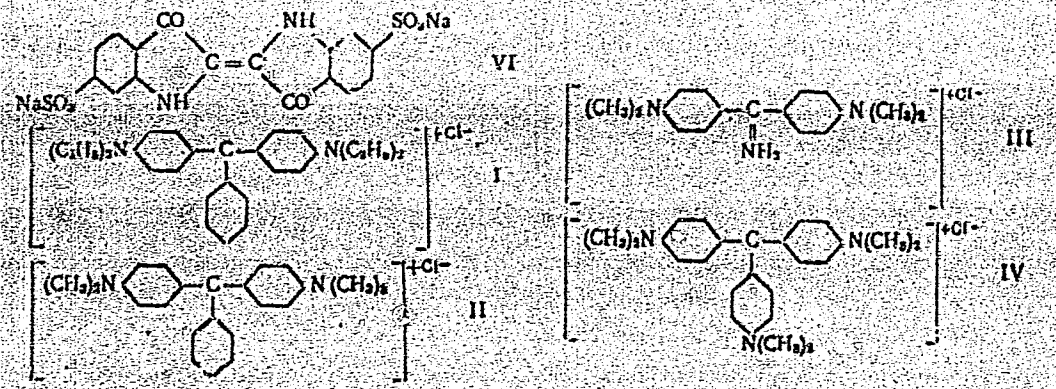


L 6715-65
ACCESSION NR: AP4042208 ENCLOSURE: 01



VI

I

II

III

IV

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