"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

9.5000,9.3200

77181
SOV/108-15-1-7/13

AUTHOR: Aybinder, I. M.

TITLE: On Computation of Radio-Receiver Noises

PERIODICAL: Radiotekhnika, 1960, Vol 15, Nr 1, pp 48-59 (USSR)

ABSTRACT: The total noise level of a receiver may be characterized by the equivalent spectral density of the noise power P_{NAE} obtained by referring all noise components to the antenna level. The sensitivity of the receiver, i.e., the minimum signal power in the antenna P_{SA} necessary to obtain the required signal-to-noise ratio α, may then be expressed as

$$P_{SA} = P_{NAE} \Delta f \alpha, \qquad (1)$$

Card 1/17

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

On Computation of Radio-Receiver Noises

77181
SOV/108-15-1-7/13

The noise intensity of complex linear quadrupoles may also be evaluated by the noise level coefficient H. It is assumed that the signal source is noiseless, i.e., $h_s = 0$ (see Fig. 1, where noise-producing elements are shaded).

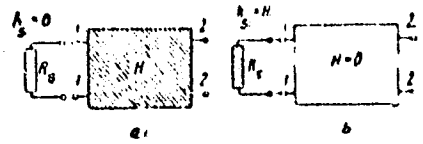


Fig. 1.

H is then defined as the noise intensity that should be attributed to the signal source, in order to produce an unchanged output noise while the quadrupole is noiseless (see Fig. 1b). The method of direct summation of noise intensities of a linear passive system is explained by considering Fig. 2, which shows n elementary noise

Card 3/17

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

where h_i' is the output noise intensity produced by the i-th elementary noise source. Since the system is linear it may be written $h_i' = \beta_i h_i$, where β_i is a constant factor depending only on the frequency and the circuit diagram. Therefore, H_c' may be expressed as

$$H_c' = \sum_{i=1}^{n} \beta_i h_i. \tag{3}$$

With this equation, and referring to Fig. 1, the noise level coefficient is then defined as

$$H = \frac{\Sigma \beta_i h_i}{\beta_s}. \tag{4}$$

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

where β_s is a coefficient analogous to f_i but referred to the signal source. Thus the problem of summing the noise intensities is reduced to determining coefficients β_i. The convenience of the proposed method consists in that β_i may be easily found by using the reciprocity theorem. Let the shaded part in Fig. 3a represent an arbitrary i-th elementary noise source referred to the input of the system.

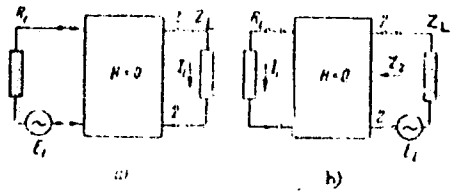


Fig. 3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

When the matched impedance $E_L = R - ix$ is connected to terminals 2-2, the output noise intensity is $h_i' = I_i^2 R$, where I_i is the spectral current density produced at the output load Z_L by the i-th noise source. When expressed in the above noise units, $h_i = E_i^2/4R_i$, and we have

$$\beta_i = \frac{h_i'}{h_i} = \frac{4I_i^2 R_i R}{E_i^2}. \qquad (5)$$

The reciprocity theorem indicates that the same current I_i flows through the internal resistance R_i of the noise source when the same noise emf E_i is connected to Z_L, as shown on Fig. 3b. The noise intensity introduced through terminals 2-2 is $E_i^2/4R$, the part of which

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

appearing at the internal of the i-th noise source is $I_i^2 R_i$. In accordance with Eq. (5), the ratio of these noise intensities determines β_i. The coefficients β_i, later referred to as absorption coefficients, may be determined by using an auxiliary generator of a sinusoidal a-c voltage. When β_i values are determined by measurement or computation, the noise intensities may be summed up according to Eqs. (3) and (4). Based on the above method, expressions for noise intensity computation are derived for various basic elements of a radio channel. For the antenna the expression for noise intensity h_A is derived under the assumption that the antenna is placed in the center of a sphere with an absolutely black inside surface. It is a transmitting antenna of which the radiated power P_o is completely absorbed by the sphere. Any surface element ΔS of the sphere is absorbing power $P_i = 1/4\pi \cdot D_i \Delta \Omega_i P_o$,

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

$$h_A = \frac{1}{4\pi}\int Dh d\Omega. \qquad (6)$$

Since the noise intensity h in a given direction is $h = T/T_o$, the noise temperature of the antenna is

$$T_A = \frac{1}{4\pi}\int DT d\Omega. \qquad (7)$$

An expression is given for h_A in which the coefficients β_{at} and β_L account for, respectively, the radiated energy absorbed by the air and the antenna losses. In accordance with Eq. (4) the noise level coefficient of the feeder is defined as

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

$$H_f = \frac{\beta_f H_f}{\beta_A} \cdot \frac{1-\beta_A}{\beta_A}. \qquad (10)$$

where $\beta_f = 1 - \beta_A$ is the absorption coefficient of the feeder and β_A is the absorption coefficient of the antenna (see Fig. 5).

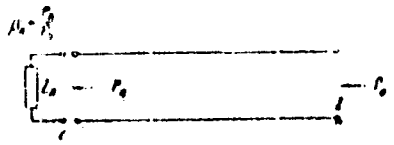


Fig. 5

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

In case of n elementary noise sources connected in parallel or in series, as illustrated by Figs. 6a and 6b, respectively,

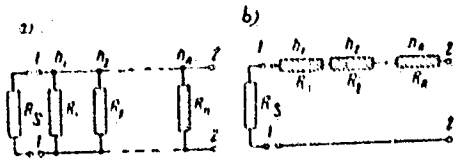


Fig. 6.

the noise level coefficient is defined by Eqs. (12) and (13), respectively.

$$H_n = R_S \sum_{i=1}^{n} \frac{h_i}{R_i} . \qquad (12)$$

Card 12/17

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

condition. The general circuit diagram of the triode and and its noise equivalent diagram are shown in Figs. 8a and 8b.

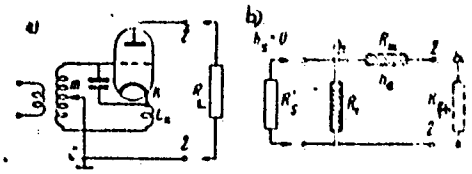


Fig. 8.

The expression derived for the noise level coefficient H_{t_1} of the triode circuit is given as

$$H_t = h_t \frac{R'_s}{R_i} + R_n \frac{R'_s}{R_0^2}, \qquad (16)$$

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

where R_s' is the input impedance referred to the section grid-cathode; R_T is a component of the input impedance depending on the electron inertia; h_T is the noise level coefficient of $R_T (h_T \approx 5)$, and $R = R_T R_u' / (R_T + R_u')$ is the equivalent input impedance. The circuit diagram of the second triode stage is shown in Fig. 9.

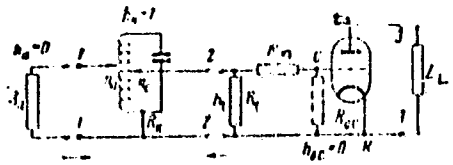


Fig. 9.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

The expression for the noise level coefficient of this stage is defined by Eq. (19)

$$H_2 = \frac{1-\beta_a}{\beta_a} + \frac{H_{t2}}{\beta_a}. \qquad (19)$$

where β_a is the absorption coefficient of the output resistance R_a of the first tube; β_a equals $R_k'/(R_k' + R_a)$ where $R_k' = n_a^2 R_k$, H_{t2} is the noise level coefficient of the tube. An expression similar to Eq. (19) may be derived for any stage. The total noise level coefficient referred to the antenna is then

$$H_{EA} = h_A + \frac{1-\beta_A}{\beta_A} + \frac{H_{t_A}}{\beta_A} + \frac{1-\beta_1}{\beta_A \beta_a M_1} + \frac{H_{t_2}}{\beta_A \beta_a M_1} + \ldots \qquad (20)$$

where M_1 is the nominal amplification factor.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

S/108/62/017/004/008/010
D288/D301

9,3200

AUTHOR: Aynbinder, I.M., Member of the Society (see Association)

TITLE: Basis of statistical calculation of radio circuits

PERIODICAL: Radiotekhnika, v. 17, no. 4, 1962, 52 - 60

TEXT: General methods of mathematical statistics and probability analysis are recommended for application to design of electronic circuits, to be based on the assessment of operating characteristics such as stage gain, bandwidth, oscillator amplitude etc. as function of individual parameters like mutual conductance of valves Q-factor, component values including tolerances etc. A detailed analysis of the statistical distribution of valve anode current and slope follows, based on the general equation $V_x = \sigma_x/x$, where V - variation, x - expectation and σ_x^2 - random distribution. Two basic triode operational modes are considered, fixed- and self-bias, and the V^2 functions is written down, interpreted and illustrated by a

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

42075

S/108/62/017/011/004/007
D413/D308

AUTHOR: Ayrbinder, I.M., Member of the Society (see Association)

TITLE: Noise intensity in circuits containing negative resistances

PERIODICAL: Radiotekhnika, v. 17, no. 11, 1962, 30-43

TEXT: Since the input stages of modern radio receivers often contain parametric, tunnel-diode or other types of amplifiers, there is a need for a general method of evaluating noise parameters in linear networks containing both positive and negative noisy resistances. The author reviews the normal method of analysis and parameters for linear networks, and then shows that these can be straightforwardly generalized to cover negative-resistance elements provided full account is taken of the negative sign. Certain facets of the analysis are examined using as an example a triode amplifier with a negative resistance in its input circuit; it is shown that for any given absolute value of source impedance the noise intensity

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, I.M.

Noise intensity of a circuit with negative resistances. Radiotekhnika 17 no.11:30-43 N '62. (MIRA 15:11)

1. Deystvitel'nyy chlen Nauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyazi.
(Radio--Noise)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 10332-63 BDS

ACCESSION NR: AP3000431 S/0108/63/018/005/0005/0021

AUTHOR: Aynbinder, I. N. (Member of the Society) 46

TITLE: Fundamentals of a linear theory of parametric amplifiers

SOURCE: Radiotekhnika, no. 5, 1963, 5-21

TOPIC TAGS: parametric amplifier, theory of parametric amplifier

ABSTRACT: Since 1957 when the first superhigh-frequency low-noise parametric amplifier appeared, there has been a lack of general theory covering such amplifiers. Filling this gap, the author has developed unified formulae equally applicable to both the linear and the parametric coupled circuits. Sinusoidal voltages and currents in a circuit that contains a nonlinear capacitance are considered. The latter is treated as a "parametric transformer", and its fundamental theory is developed for both regenerative and nonregenerative cases. It is inferred that: (a) the linear transformer is a particular case of non-regenerative parametric transformer; (b) power and noise relationships depend on the input and output circuits. Allowance for losses in a real parametric transformer results in a block diagram of the generalized parametric amplifier

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 10332-63

ACCESSION NR: AP3000431

shown in Fig 9 of the Enclosure. Gain and noise are considered in these specific parameteric devices: nonregenerative transducer, regenerative transducer, two-circuit amplifier, and single-circuit amplifier. Orig. art. has: 34 equations, 15 figures.

ASSOCIATION: none

SUBMITTED: 03Sep62 DATE ACQ: 10Jun63 ENCL: 01

SUB CODE: CO NR REF SOV: 003 OTHER: 003

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, I.M.

Principles of the unified theory of two-terminal frequency converters. Radiotekhnika 19 no.3:48-62 Mr '64. (MIRA 17:4)

1. Deystvitel'nyy chlen Nauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyazi imeni Popova.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

VBR

ACCESSION NR: AP4026150 S/0108/64/019/003/0048/0062

AUTHOR: Aynbinder, I. M. (Active member)

TITLE: Fundamentals of a unified theory of two-pole frequency converters

SOURCE: Radiotekhnika, v. 19, no. 3, 1964, 48-62

TOPIC TAGS: frequency converter, frequency conversion, two pole frequency converter, SHF converter, diode frequency converter, crystal frequency converter, parametric frequency converter, tunnel diode frequency converter

ABSTRACT: P. Strum's attempt (PIRE, v. 41, no. 7, 1953) to create a unified theory of a parametric frequency converter is further developed and generalized in the present article to cover crystal diode, tunnel, and parametric converters. A general block diagram is shown in Enclosure 1 where two linear passive quadripoles are coupled by a noiseless perfect transformer. This transformer (linear, with variable resistance or reactance) accounts for the differences between all types of converters and linearly-coupled circuits. As the characteristics of all transformer types can be specified by two simple and independent formulas only (transformation and power), all converter types can be calculated

Card 1/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

ACCESSION NR: AP4026150

by classical methods of coupled-circuit design. By using negative-resistance-circuit methods, all converters operating under regenerative conditions can also be calculated. The amplitude of the usable harmonic of variable-parameter oscillations, and, therefore, the coupling admittance, decreases with a higher number of the harmonic; losses and noise inserted by this parameter into the coupled circuits practically do not change. Hence, in the case of a combination conversion, the coupling between the low-Q circuits is weak which results in a substantial reduction of the transfer constant and an increase in the noise of the converter and the entire conversion circuit. Orig. art. has: 8 figures, 30 formulas, and 2 tables.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi (Scientific and Technical Society of Radio Engineering and Electrocommunication)

SUBMITTED: 16Mar63 DATE ACQ: 16Apr64 ENCL: 01

SUB CODE: EC NO REF SOV: 005 OTHER: 004

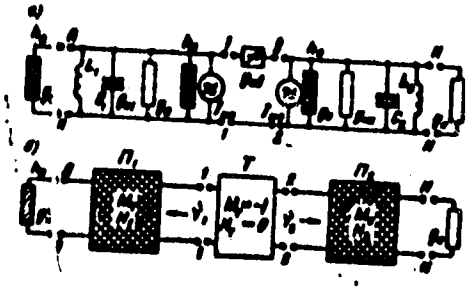
Card 2/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

ACCESSION NR: AP4026150

ENCLOSURE: 01



An equivalent circuit and a block diagram of the generalized two-pole frequency converter

Card 3/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 38602-65

ACCESSION NR: AP5005978 S/0108/65/020/002/0003/0013

AUTHOR: Aynbinder, I. M. (Active member)

14

B

TITLE: Cascading negative-resistance-type amplifiers

SOURCE: Radiotekhnika, v. 20, no. 2, 1965, 3-13

TOPIC TAGS: amplifier, parametric amplifier, tunnel diode amplifier, quantum amplifier, shf amplifier

ABSTRACT: Based on the general theory of negative-resistance circuits, single- and multistage circulator-type amplifiers are analyzed; shf parametric, tunnel-diode, and quantum amplifiers are covered. It is found that: (1) Cascading of several stages permits decreasing the variation V of amplifier parameters; the variation is minimum when the amplification is distributed uniformly over the stages; (2) As the number n of the stages increases, the stability M quickly approaches its limit $\frac{V_n}{V_0} \to \ln M$; the reasonable number of stages may be determined from $n \approx \frac{\ln M}{2}$; (3) The passband spread decreases with the increasing

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 38602-65
ACCESSION NR: AP5001978

number of stages according to this formula: $\frac{\ln M}{2n}$; (4) The noise-intensity spread only slightly depends on the variation of the regeneration factor; (5) Using the noise intensity as a universal fundamental quantity for evaluating noise levels in two-terminal networks (with positive or negative internal resistance) permits essential savings in the calculation work. Orig. art. has: 8 figures and 57 formulas.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi (Scientific and Technical Society of Radio Engineering and Electrocommunication)

SUBMITTED: 24Jun64 ENCL: 00 SUB CODE: EC

NO REF SOV: 002 OTHER: 000

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 4911-66 FBD/EWT(1)/EWA(h) GW/WS-2

ACC NR: AP5027023 SOURCE CODE: UR/0120/65/000/005/0120/0123

AUTHOR: Aynbinder, I. M.; Soloshek, L. K.; Zakharov, A. V.

ORG: none

TITLE: Modulating radiometer with parametric converter input

SOURCE: Pribory i tekhnika eksperimenta, no. 5, 1965, 120-123

TOPIC TAGS: radiometer, radio telescope

ABSTRACT: A low-noise radiometer intended for the study of weak radio emission from the Moon and Jupiter at 70.25 cm is described. The block diagram of the radiometer is shown in the figure. The antenna switch employs DGTs-27 diodes whose capacitances

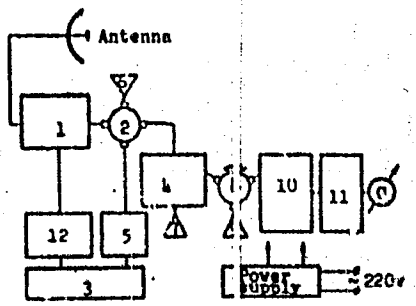


Fig. 1. Modulation radiometer

1 - Directional coupler; 2 - 3-way switch; 3 - noise generator; 4 - antenna switch; 5 - divider; 6 and 7 - cold noise temperature reference; 8 - ferrite coupler; 9 - balancing load; 10 - parametric amplifier; 11 - standard P-5-9 i.f. and lf amplifier.

Card 1/2 UDC: 621.317.63:621.317.794

0701 0818

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 4911-66

ACC NR: AP5027023

are compensated by inductances. In the off position, the transmission loss through the switch is 18 db; in the on position, it is 0.2—0.3 db; VSWR = 1.21:1. It has a 3-db bandwidth of 15%, and switching time is 15—20% of the modulating period. The ferrite directional coupler (8) is a Y-circulator with 1.6-db transmission loss in the forward direction and 17.3 db in the backward direction; VSWR = 1.12:1. In order to provide maximum sensitivity, additive noise is applied through the attenuator (12) to the antenna arm, balancing the temperature of the arms. The parametric amplifier design assures maximum sensitivity by maximizing the ratio of its noise temperature to the bandwidth, keeping the regeneration factor low (0.5—0.6). The parametric converter converts the input signal to the i.f. range with the aid of a klystron oscillator with a 9228-Mc pump frequency. An additional 398-Mc BFO and a balanced mixer form the output signal. Converter noise temperature is 150K with 15-Mc bandwidth; however, in order to assure proper coupling with coupler 8, the converter temperature (allowing for losses in the coupler) is 300K. Orig. art. has: 2 figures. [BD]

SUB CODE: EC, MW SUBM DATE: 14Jul64/ ORIG REF: 001/ ATD PRESS: 4136

BC

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

BOKHMAN, Ya.V. (Leningrad, K-105, Yakovlevskiy, d.6 kv. 78);
AYNBINDER, N.M. (Leningrad, S-36, ul. Vosstaniya, d.1/39, kv.33)

Mesodermal mixed tumors of the cervix uteri. Vop. onk. 9 no.6: 82-87 '63. (MIRA 17:8)

1. Iz ginekologicheskogo otdeleniya (zav. - prof. V.P. Tobilevich) Instituta onkologii AMN SSSR (dir. - deystvitel'nyy chlen AMN SSSR prof. A.I. Serebrov).

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, N.M.; DIL'MAN, V.M.; MUKHINA, Ye.P.; NECHAYEVA, I.D.; SHARKOVA, Zh.M.

Experience with the antibiotic 2703 in six patients with chorioepithelioma of the uterus. Vop. onk. 10 no.5:103-107 '64. (MIRA 18:8)

1. Iz Instituta onkologii AMN SSSR (dir. - prof. A.I.Serebrov). Adres avtorov: Leningrad, P-129, 2-ya Berezovaya alleya, 3, Institut onkologii AMN SSSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, N.M.; NEKHAYEVA, L.V.; PTOKHOV, M.P.

Cytologic examination of ascitic and pleural fluids in patients with malignant tumors of the ovaries for the purpose of diagnosis and prognosis. Vop. onk. 11 no.8:31-37 '65.

(MIRA 18:11)

1. Iz ginekologicheskogo otdeleniya (zav. - prof. V.P.Tobilevich) i tsitologicheskoy laboratorii (zav. - doktor med.nauk M.P. Ptokhov) Instituta onkologii AMN SSSR (direktor - deystvitel'nyy chlen AMN SSSR prof. A.I.Serebrov).

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

GRECHISHKIN, V.S.; AYNBINDER, N.Ye.

Quadrupole effects in the nuclear resonance spectrum of urea and sodium thiosulfate single crystals. Fiz. tver. tela 3 no.6:1821-1826 Je '61. (MIRA 14:7)

1. Permskiy gosudarstvennyy universitet im. A.M.Gor'kogo.
(Electric moments) (Sodium thiosulfate crystals--Spectra)
(Urea crystals--Spectra)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

S/181/61/003/010/011/036
B111/B138

AUTHORS: Grechishkin, V. S., and Aynbinder, N. Ye.

TITLE: Relative intensities of nuclear resonance lines in single crystals in the presence of magnetic and quadrupole interactions

PERIODICAL: Fizika tverdogo tela, v. 3, no. 10, 1961, 2981 - 2986

TEXT: The present paper is a continuation of Ref. 1(V. S. Grechishkin, N. Ye. Aynbinder, FTT 3, no. 6, 1821, 1961), where formulas had been given for the energy levels of nuclear resonance in the case of quadrupole interaction (nuclear spin J = 1 and J = 3/2). For these spins, formulas are now derived for the relative integral intensities of the absorption lines. The external magnetic field is along the principal axis z of the gradient tensor of the crystal's electric field. The method of calculation has been provided by L. S. Maysnts (Ref. 3: Teoriya i raschet kolebaniy molekul. Izd. AN SSSR, M., 1960). The power absorbed by the specimen is proportional to $A^2\sin^2\theta_1\sin^2\varphi_1 + (B\sin\theta_1\cos\varphi_1 + C\cos\theta_1)^2$ (3).

1st case: J = 1. If $\theta = 0$ and $\varphi = 0$, $\theta_1 = \pi/2$, $\varphi_1 = 0$ (θ being the angle

Card 1/4

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

$$\left.\begin{aligned} A^2_{3,1} &= \frac{1}{2} - \frac{\eta}{2\sqrt{R^2+\eta^2}}; \\ A^2_{3,2} &= \frac{1}{2} + \frac{\eta}{2\sqrt{R^2+\eta^2}}; \\ A^2_{2,1} &= \frac{\eta}{R^2+\eta^2}. \end{aligned}\right\} \qquad (11).$$

Hence, if $\theta = \pi/2$ and $\varphi = 0$, the r-f coil axis will be directed along the x-axis, and the following will be valid: $B^2_{2,1} = \frac{(3+\eta)^2}{(3+\eta)^2 + 4R^2}$; $B_{3,2} = B_{3,1} = 0$. The position of the principal axes of the gradient tensor of the crystal's electric field may be determined from the spectra with different crystal positions. 2nd case: $J = 3/2$, is treated in a similar way. Formulas obtained are valid with the exception of the intersection points of the energy levels. If the r-f coil axis is directed along x, the transitions $\lambda_1 \to \lambda_2$ and $\lambda_3 \to \lambda_4$ will be forbidden. In general, all of the six possible transitions can be excited near the level intersection points by a rotation of the r-f coil. But some of them, and one at least, are

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

45625

S/141/62/005/006/009/023
E032/E414

24.7900

AUTHORS: Aynbinder, N.Ye., Grechishkin, V.S.

TITLE: Energy levels and relative line intensities in the case of nuclear spin resonance in single crystals

PERIODICAL: Izvestiya vysshikh uchebnykh zavedoniy. Radiofizika, v.5, no 6, 1962, 1123-1129

TEXT: One of the ways of approaching this problem is to determine the resonance frequencies experimentally for an arbitrary orientation of the crystal and estimate the polar angles of the external magnetic field relative to the principal axes of the crystal, and then adjust the crystal until the required direction of the external field relative to the crystal is achieved. A calculation was therefore carried out of the nuclear spin resonance energy levels in the case of $J = 3/2$ and small departures (of the order of 10°) of the direction of $\underline{H}_0$ from each of the principal axes of the electric field gradient tensor of the crystal. The specific substance taken for this calculation was $Na_2S_2O_3 \cdot 5H_2O$. The method of zero-splitting cone (C.Dean, Phys. Rev. v.96, 1954, 1053) is employed and extended to the case of an

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, N.Ye.; GRECHISHIN, V.S

Nuclear resonance energy levels in single crystals in the presence of magnetic and quadrupole interactions. Izv. vys. uchob. zav.; fiz. no.5:27-31 '63. (MIRA 16:12)

1. Permskiy gosudarstvennyy universitet imeni A.M.Gor'kogo.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

GRECHISHKIN, V.S.; AYNBINDER, N.Ye.

Quadrupo_ energy levels for certain spins. Izv. vys. ucheb. zav.; radiofiz. 6 no.4:729-737 '63. (MIRA 16:12)

1. Permskiy gosudarstvennyy universitet.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

ACCESSION NR: AP4039675 S/0181/64/006/006/1821/1824

AUTHORS: Aynbinder, N. Ye.; Grechishkin, V. S.

TITLE: A method of orienting monocrystals in quadrupole resonance

SOURCE: Fizika tverdogo tela, v. 6, no. 6, 1964, 1821-1824

TOPIC TAGS: nuclear quadrupole resonance, quadrupole coupling constant, asymmetry parameter, electric field gradient, spin Hamiltonian

ABSTRACT: A method is given for determining the orientation of the principal axes of the electric field gradient tensor in a monocrystal for spin I=5/2. The polar angle θ and azimuthal angle ϕ of the external magnetic field H_0 in the principal axis system are found from the equations

$$\cos\theta = \sqrt{\frac{AD+BC}{B+D}}$$

$$\cos 2\varphi = \frac{C-A}{B(1-C)+D(1-A)},$$

where

$$A = \frac{14R^2 - 1000R - 5(1-\eta^2)}{42R^2}; \quad B = -\frac{1}{5}; \quad D = -\frac{2\eta}{5-\eta^2}$$

$$C = \frac{196(3+\eta^2)^2 - 52(3+\eta^2)R^2 + 162R^2 - 259R^4 - 200R^6}{81(3-\eta^2)R^4},$$

$$R = \frac{4\mu H_0}{eQq_{zz}}$$

Card 1/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

ACCESSION NR: AP4039675

and μ is the nuclear magnetic moment. The quadrupole coupling constant eQq_{zz} and the asymmetry parameter η are found experimentally with no magnetic field. Diagonalizing the spin Hamiltonian matrix leads to a sixth order secular equation which can be written in the form

$$\lambda^6 + a_1\lambda^5 + a_2\lambda^4 + a_3\lambda^3 + a_4\lambda^2 + a_5\lambda + a_6 = 0,$$

This is also the expansion of

$$(\lambda - \lambda_1)(\lambda - \lambda_2)(\lambda - \lambda_3)(\lambda - \lambda_4)(\lambda - \lambda_5)(\lambda - \lambda_6) = 0,$$

where the energy eigenvalues can be expressed in terms of the experimentally observed resonance frequencies

$$\begin{aligned}
\lambda_1 &= \frac{1}{6}(\nu_1 + 2\nu_2 + 3\nu_3 + 4\nu_4 + 5\nu_5);\\
\lambda_2 &= \frac{1}{6}(\nu_1 + 2\nu_2 + 3\nu_3 + 4\nu_4 - \nu_5);\\
\lambda_3 &= \frac{1}{6}(\nu_1 + 2\nu_2 + 3\nu_3 - 2\nu_4 - \nu_5);\\
\lambda_4 &= \frac{1}{6}(\nu_1 + 2\nu_2 - 3\nu_3 - 2\nu_4 - \nu_5);\\
\lambda_5 &= \frac{1}{6}(\nu_1 - 4\nu_2 - 3\nu_3 - 2\nu_4 - \nu_5);\\
\lambda_6 &= \frac{1}{6}(-5\nu_1 - 4\nu_2 - 3\nu_3 - 2\nu_4 - \nu_5).
\end{aligned}$$

Card 2/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

ACCESSION NR: AP4019675

Thus the coefficients a_3 and a_4 can be found experimentally. It is concluded that θ and ϕ can be determined within 0.5°. Orig. art. has: 11 equations.

ASSOCIATION: Permskiy gosudarstvennyy universitet im. A. M. Gor'kovo (Permsk State University)

SUBMITTED: 25Nov63 DATE ACQ: 19Jun64 ENCL: 00

SUB CODE: NP,SS NO REF SOV: 001 OTHER: 003

Card 3/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, M.Ye.

Solution of the spin-Hamiltonian for triplet states. Zhur. strukt. khim. 5 no.4:634-635 Ag '64. (MIRA 18:3)

1. Permskiy gosudarstvennyy universitet.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 9182-66 EWT(1) IJP(c) GG/WW

ACC NR: AP6000117 SOURCE CODE: UR/0058/65/000/008/D054/D054

SOURCE: Ref. zh. Fizika, Abs. 8D439

AUTHORS: Aynbinder, M. Ye.; Beshina, I. N.; Grechishkin, V. S.; Kozlova, A. N.; Subbotin, G. I.

ORG: none

TITLE: Relative intensities of EPR lines in crystals in the case of an effective spin 3/2

CITED SOURCE: Tr. Yestestv.-nauchn. in-ta pri Permsk. un-te, v. 11, no. 2, 1964, 147-151

TOPIC TAGS: electron paramagnetic resonance, EPR spectrum, transition probability, crystal structure

TRANSLATION: Formulas are given for the calculation of the energy levels and transition probabilities when the directions of the permanent magnetic field coincide with the axes of the crystalline electric field. The energy levels and the transition probabilities are obtained for the ion Cr^{3+} in $K_3CoCr(CN)_6$. The calculation was verified for strong intermediate fields. Good agreement with theory was obtained.

SUB CODE: 20

Card 1/1

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 61924-65 EWT(1)/EPF(c) Pi-4 IJP(c) WW/GG

ACCESSION NR: AP5014518 UR/0141/65/008/002/0416/0420

AUTHOR: Aynbinder, M. Ye.; Grechishkin, V. S.

TITLE: Energy levels and relative intensities of NQR lines for some integer spins

SOURCE: IVUZ, Radiofizika, v. 8, no. 2, 1965, 416-420

TOPIC TAGS: nuclear quadrupole resonance, line, integer spin, energy level, relative intensity

ABSTRACT: Earlier calculations of the energy levels and relative intensities of quadrupole resonance lines, in the case of integer spin, were carried out only for J = 1. When J ≥ 2, the quantum-mechanical calculations become very complicated. Since recent data have shown that nuclear quadrupole resonance in B^{10} (J = 3) has great practical significance, the author presents a table of the eigenvalues of the Hamiltonian of the quadrupole interaction in a zero magnetic field. From these eigenvalues it is possible to obtain the eigenvectors and consequently the relative intensities in a straightforward albeit time-consuming method. The formulas presented in the tables are valid for all single crystals and can be used to calculate the asymmetry parameter with the aid of the experimental data, and to identify the absorption lines. The results are also useful for studies involving the Mossbauer

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 61924-65

ACCESSION NR: AP5014518

effect. Orig. art. has: figure, 1 formula, and 2 tables.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm State University)

SUBMITTED: 14May64 ENCL: 00 SUB CODE: NP

NR REF SOV: 002 OTHER: 002

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, N.Ye.; GRECHISHKIN, V.S.; SUBBOTIN, S.I.

Electron paramagnetic resonance spectra of some charge-transfer complexes of biological importance. Opt. i spektr. 18 no.6:1081-1083 Je '65. (MIRA 18:12)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

ACC NR: AP6022076 SOURCE CODE: UR/0141/66/009/003/0507/0512

AUTHOR: Grechishkin, V. S.; Gordeyev, A. D.; Aynbinder, N. Ye.

ORG: Perm' State University (Permskiy gosudarstvennyy universitet)

TITLE: Quadrupole relaxation in a multilevel system [Report at the 12th Conference on Low-Temperature Physics, Kazan', 1965]

SOURCE: IVUZ. Radiofizika, v. 9, no. 3, 1966, 507-512

TOPIC TAGS: quadrupole ~~relaxation~~ moment, spin relaxation

ABSTRACT: The quadrupole relaxation is studied for a spin of $J = 7/2$ as this spin provides interesting possibilities for investigating the effect of initial conditions on the speed of relaxation. The method of kinetic equations is used; the operational Laplace method is used for solving the population equations. A relation between relaxation constants is derived; the relaxation process is complex and, in most cases, can be described by three relaxation constants. With small $\gamma = W_2/W_1$, the rate of approaching the equilibrium, in a multilevel system, can be controlled by varying the initial conditions (applying several r-f fields simultaneously). With

Card 1/2 UDC: 539.285

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

ACC NR: AP7007626

SOURCE CODE: UR/0386/67/005/003/0087/0090

AUTHOR: Grechishkin, V. S.; Aynbinder, N. Ye.

ORG: Perm' State University. Problem Laboratory for Radiospectroscopy (Permskiy gosudarstvennyy universitet problemnaya laboratoriya radiospektroskopii)

TITLE: Two-frequency excitation of quadrupole spin echo

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 5, no. 3, 1967, 87-90

TOPIC TAGS: spin echo, quadrupole moment, forbidden transition, transition probability, quantum resonance phenomenon

ABSTRACT: The authors describe a new physical phenomenon, which comes into play when radiofrequency pulses with suitable carrier frequencies excite several transitions simultaneously, for example $|\pm 1/2\rangle \rightarrow |\pm 3/2\rangle$ and $|\pm 3/2\rangle \rightarrow |\pm 5/2\rangle$. It is shown that under two-frequency excitation, additional echo signals appear, whose positions depend on the magnitude of the electric-field-gradient asymmetry parameter. Such a perturbation induces cascaded spin transfer from the lowest level to the uppermost energy level via the intermediate state ($|\pm 3/2\rangle$). It is precisely this change in the character of the perturbation operator which leads to the new mechanism of spin-echo signal production. The authors have calculated the instants of time at which the additional echo signals appear, and checked their calculations with experiments on $SbCl_3$ and $BiCl_3$. According to calculations, the echo was expected to be observed at $t = 2\tau$,

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, R.M.

Incidence of silicosis among mine openers in the Kuznetsk Basin. Gig. truda i prof. zab. 4 no.12:40-41 D '60. (MIRA 15:3)

1. Novosibirskiy nauchno-issledovatel'skiy sanitarnyy institut.
(KUTNETSK BASIN—LUNGS—DUST DISEASES)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER,S.[Ainbinders,S.](Riga); GLUDE,R.(Riga)

Cold welding of steel. In Russian. Vestis latv ak no.4:77-82 '60. (MEAI 10:7)

1. Akademiya nauk Latviyskoy SSR, Institut mashinovedeniya.
(Welding) (Steel)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 26105-65 EWP(e)/EWT(m)/EWP(v)/T/EPR/EWP(t)/EWP(k)/EWI(b) Pf-4/Pg-4 IJP(c)
ACCESSION NR: AP4047015 JD/HM S/0135/64/000/010/0028/0031

AUTHOR: Aynbinder, S.B. (Candidate of technical sciences); Loginova, A. Ya. (Engineer); Makarov, V.I. (Engineer); Rastrigina, E.F. (Candidate of technical sciences)

TITLE: Cold welding of metals using solid finely divided particles

SOURCE: Svarochnoye proizvodstvo, no. 10, 1964, 28-31

TOPIC TAGS: cold welding, spot welding, metal treatment, metal impurity, metal powder, aluminum base alloy, aluminum welding, copper welding

ABSTRACT: This article presents the results of investigations concerning the development of a method of cold spot welding which does not require special surface treatment of the metal and which is relatively insensitive to impurities. A layer of iron, sand, emery, nickel, or aluminum powder was applied to the surface of aluminum and copper specimens 3X30X80 mm in dimensions. It was determined from these tests that the powder must be harder than the specimens being welded, and that powder from reduced iron produced the best results. The effect of the particle size of the powders was also investigated. As shown in Fig. 1 of the Enclosure, increasing the dimensions of the powder particles increases the strength of the welded spot to a certain limit, after which subsequent en-

Card 1/5

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

26105-65
ACCESSION NR: AP4047015

largement of the particle size produces no increase in strength. As shown in Fig. 2 of the Enclosure, however, the strength of a welded spot is less when coarse powder is used. The effect of the density of the powder layer was investigated on aluminum specimens for iron powder 100 - 160 μ in diameter. The specimens were also tested for sensitivity to impurities. As shown in Fig. 3 of the Enclosure, the presence of a lubricant on the surface somewhat reduced the strength of the weld. The authors concluded that the dimensions of the powder should be no less than 150 - 200 microns; the density of the layer of powder should be approximately 0.5 mm; and the relative depth of the punch impressions should be 70 - 75% for aluminum and 85-87% for copper (not taking into account the density of the layer of powder). Orig. art. has: 1 table and 7 figures.

RELEASE: 06/06/2000

SA AYN E
Sed. A

Chestnut Strength

530.312

6857. On determination of the dynamic strength of metals. [illegible] Abramov. Lett. PSR Zin. Akad. Vist., No. 1, 137-48 (1951) in Russia.

The available experimental data [illegible] qualitatively [illegible] only by considering the mechanics of deformation on application of a dynamic load. [illegible] be obtained from the theory of propagation of plastic deformation [illegible]. Similarly [illegible] can only be [illegible] by the equality of

the [illegible] of the ratios of the wavelengths to the cross-sectional areas of the [illegible] plates.

A. [illegible]

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, S. B.

1. S. B. AYNBINDER, D. I. GOLUBEV.

2. USSR (600)

4. Cast Iron

7. Investigation of fatigue strength of samples made of graphitized malleable cast iron. Latv. PSR Zin. Akad. Vestis no. 8. 1951.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, S.B.

USSR.

Mechanism of bond formation in cold welding of metals. S. B. Ainbinders and E. [illegible] Klokova. *Zaiavlas PSR Zinatnu Akad. Vestis* 1954, No. 10 (Whole No. 67), 113-28 (in Russian).—Steel brushing of metal surfaces increased the surface microhardness of Al, Cu, Armco Fe, and brass 2-5 times. Photomicrographs of the welding zone after cold-pressure welding of the steel-brushed metals indicated that during the welding this hard surface layer was broken into fragments, and the weld arose by mol. cohesion of the soft metal underneath the hard layer. In pressure welding it is necessary to crush both the oxide film and the hard surface layer before bond can take place. There was approximate inverse correlation between the degree of deformation necessary for bonding and the hardness ratio oxide:metal. This is explained by less energy consumed in crushing of harder and brittler oxides. Andrew Draynieks

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

SOV/112-57-9-18969

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1957, Nr 9, p 139 (USSR)

AUTHOR: Aynbinder, S. B.

TITLE: Type KUS-53 Universal Tongs for Cold-Pressure Welding of Wires, Buses and Electric Contacts (Suggestion by S. B. Aynbinder) (Universal'nyye kleshchi dlya kholodnoy svarki davleniyem provodov, shin i elektricheskikh kontaktov tipa KUS-53 /Predlozheniye S. B. Aynbindera/)

PERIODICAL: Sb. rats. predlozheniy. M-vo elektrotekhn. prom-sti SSSR, 1955, Nr 55, pp 35-36

ABSTRACT: Bibliographic entry.

Card 1/1

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDERS S.

AYNBINDERS, S.

3

Preparation of surfaces for cold-welding. S. Ainbinder and E. Kokova. U.S.S.R. 101,886, Sept. 25, 1955. To eliminate cleaning and degreasing of surfaces to be cold-welded, they are coated with a layer of a hard metal e.g. Ni. M. Hosh

2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYBINDER, S.B.

AID P - 4817

Subject : USSR/Engineering

Card 1/1 Pub. 107-a - 3/13

Author : Aybinder, S. B.

Title : Certain problems in cold pressure-welding of metals

Periodical : Svar. proizv., 3, 8-11, Mr 1956

Abstract : The author describes some technical aspects of cold pressure welding, such as preparation of surfaces for welding, welding of sheet metal and thin plates (non-ferrous) and welding of wires and cables (aluminum and copper wires). Some hand tools specially designed for cold pressure-welding are also mentioned and illustrated. Four macrographs, 5 photos and 4 drawings. 17 references including 9 Russian (1934-55).

Institution : Institute of Physics of the Latvian Academy of Sciences

Submitted : No date

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

SOV/137-58-9-19337

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 170 (USSR)

AUTHOR: Aynbinder, S.B.

TITLE: A Report Presented at the Conference on the Theory of Friction and Wear (Vystupleniye na soveshchanii po voprosam teorii treniya i iznashivaniya)

PERIODICAL: V sb.: Razvitiye teorii treniya i iznashivaniya. Moscow, AN SSSR, 1957, pp 142-144

ABSTRACT: During cold pressure-welding operations it is imperative that the components which are to be joined be subjected jointly, after their surfaces have been thoroughly cleaned, to plastic deformation under the action of large static pressures. Optimal welding results are obtained if the surfaces of the components are cleaned by means of a rotary steel brush. In that process the surface of the metal becomes coated with a thin brittle layer which is 3-4 times harder than the parent metal. During plastic deformation such a surface layer disintegrates readily, its particles being carried away by the flowing layers of metal thus facilitating direct contact between clean metal surfaces and favoring the creation of a strong bond. By employing

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, S. B.

SOV-135-58-9-10/20

AUTHOR: Khrenov, K.K., Academician, AS UkrSSR

TITLE: Ar Interesting Book (Interesnaya kniga)

PERIODICAL: Svarochnoye proizvodstvo, 1958, Nr 9, pp 44-45 (USSR)

ABSTRACT: This is the critical review of a book by S.B. Aynbinder, entitled "Cold Welding of Metals", published in 1957 by the Latvian Academy of Sciences.

1. Welding--USSR

Card 1/1

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AUTHOR: Aynbinder, S. B., Candidate of Technical Sciences SOV/32-24-7-62/65

TITLE: On the Measurement of the Dynamic Hardness of Metals (Ob izmerenii dinamicheskoy tverdosti metallov) With Reference to the Article by Ye.I.Timofeyev and L.A.Urvantsov Published in Zavodskaya Laboratoriya, 1957, Nr 11 (Po povodu stat'i Ye.I.Timofeyeva i L.A.Urvantsova, opublikovannoy v No 11 zhurnala "Zavodskaya laboratoriya" za 1957 g.)

PERIODICAL: Zavodskaya Laboratoriya, Vol. 24, Nr 7, 1958
pp. 906 - 907 (USSR)

ABSTRACT: The above mentioned article describes a measuring method using a tensometric apparatus and a ballistic impact test stand; the technique of the measurement consists in the fact that the impact force is directly determined, and the hardness is calculated from the ratio between impact force and impression area. It is pointed out that already in 1952 the author of the present paper described a simpler and more convenient apparatus for the determination of the dynamic hardness and of the impact force. The apparatus consists of a stand on which the sample is mounted, a bracket with the electromagnet, and the striker

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

S/686/61/000/000/003/012
D207/D303

AUTHORS: Ayntinler, S. B. and Klokova, E. F.

TITLE: On the theory of adhesion of metals during simultaneous plastic deformation

SOURCE: Soveshchaniye po voprosam teorii sukhogo treniya i obrazovaniya chastits iznosa pri sukhom trenii. Riga, 1959, 41-53

TEXT: The authors develop a qualitative theory of adhesion of metals and simultaneous plastic deformation under the action of purely normal loads; the case of combined normal and tangential loads will be dealt with in a separate publication. Adhesion is taken to mean formation of metal bonds between two metal surfaces separated by distances smaller than those between atoms in a lattice. The authors allow for the effect of surface microroughness and of surface films (cold-worked layers, absorbed films, oxides, etc.). The following conclusions are arrived at: 1) Formation of metal "bridges" occurs simply because two metal surfaces are very close to one another

Card 1/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

S/686/61/000/000/003/012
D207/D303

On the theory of ...

(distances less than atomic) and it is not necessary to assume supplementary processes such as diffusion, recrystallization, formation of amorphous structure, etc.); 2) the "bridges" may be broken by internal stresses on removal of external loads; 3) if the films present on the surface are soft, the "bridges" are not easily formed except when the films are very thin or when very high loads are applied; 4) if the surface films are brittle, the "bridges" are formed easily. The main part of the paper is concerned with refuting arguments of those, who reject the theory outlined by the present authors. There are 6 figures and 16 references: 12 Soviet-bloc and 4 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: I. M. Parks, British Welding Journal, no. 8, 1953; W. B. Hardy and I. K. Hardy, Note on static friction and on the lubricating properties of certain chemical substances, Cambridge; F. Bowden and D. Tabor, The friction and lubrication of solids, Oxford, 1954; L. R. Vaidyanath, M. G. Nicholas and D. R. Milner, British Welding Journal, 1, 1959.

Card 2/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

S/686/61/000/000/004/012
D207/D303

AUTHORS: Aynbinder, S. B. and Pranch, A. S.

TITLE: The effect of relative mechanical properties of metals on the formation and rupture of adhesion bridges at low sliding velocities

SOURCE: Soveshchaniye po voprosam teorii sukhogo treniya i obrazovaniya chastits iznosa pri sukhom trenii. Riga, 1959, 65-79

TEXT: The authors describe studies of adhesion of sliding metal surfaces, using a technique similar to that described by B. I. Kostetskiy (Ref. 6: 'Skhvatyvaniye pri trenii metallov' (Seizure on the Friction of Metals), Sbornik: Povysheniye iznosostoykosti i sroka sluzhby mashin (Collection: Increase of Wear Resistance and Working Life of Machines), Kiyev-Moscow, 1953). Two plates (5 x 20 x 60 and 5 x 30 x 30 mm) were used; one of them was sliding under a normal load over the surface of the other at the rate of 5 mm/min. The tangential stresses F, necessary to move the upper plate were

Card 1/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

measured and plotted against the distance d, transversed by sliding. Four series of experiments were carried out (1) on like pairs of plates made of aluminum, copper or iron; (2) on like pairs made of zinc or cadmium; (3) on unlike pairs of metals of different hardness: aluminum and iron, aluminum and copper, silver and copper, copper and iron; (4) on unlike pairs of the same hardness, obtained by annealing one metal and cold-working the other: iron and copper, silver and copper. For series (1) the F(d) curves showed (a) an initial rapid rise, followed by (b) flattening with F nearly constant. In stage (a) the adhesion bridging between the two metal plates tended to lift the upper plate so that in stage (b) the new bridges were not formed but the existing ones increased in size. The presence of bridges was confirmed by the fact that the tangential stresses F under zero normal loads were nearly equal (85-90%) to F under a normal load of 0.1 - 1 kg/mm^2. Series (2) metals behaved differently: F(d) curves had initial maxima followed by nearly flat portions with F = constant. This was due to hardening of zinc and cadmium at low deformations followed by softening at higher deformations: The metal in the adhesion bridges first hardened

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

BARANOV, Isaak Bentsianovich; AYUBINDER, S.B., kand.tekhn.nauk, retsenzent; SARAFANOV, kand.tekhn.nauk, red.; SIMONOVSKIY, N.Z., red.izd-va; DLUGOKANSKAYA, Yo.A., tekhn.red.

[Cold welding of plastic metals] Kholodnaia svarka plastichnykh metallov. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1959. 115 p. (MIRA 12:12)

(Cold welding)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

PHASE I BOOK EXPLOITATION SOV/5249

Aynbinder, Semen Borisovich

Novyye sposoby svarki davleniyem (New Pressure-Welding Methods) Riga, Izd-vo AN Latviyskoy SSR, 1960. 114 p. 4,000 copies printed.

Sponsoring Agency: Akademiya nauk Latviyskoy SSR. Institut avtomatiki i mekhaniki.

Ed.: Ye. Savel'yeva; Tech. Ed.: Ye. Piladze.

PURPOSE: This book is intended for technical personnel in various branches of industry.

COVERAGE: Theoretical and physical bases are reviewed for three new types of pressure welding: cold-pressure, friction, and ultrasonic welding. Practical examples of their application are given. No personalities are mentioned. There are 41 references: 32 Soviet, and 9 English.

Card 1/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

PHASE I BOOK EXPLOITATION SOV/5053

Vsesoyuznaya konferentsiya po treniyu i iznosu v mashinakh. 3d, 1958.

Iznos i iznosostoykost'. Antifriktsionnyye materialy (Wear and Wear Resistance. Antifriction Materials) Moscow, Izd-vo AN SSSR, 1960. 273 p. Errata slip inserted. 3,500 copies printed. (Series: Its: Trudy, v. 1)

Sponsoring Agency: Akademiya nauk SSSR. Institut mashinovedeniya.
Resp. Ed.: M. M. Khrushchov, Professor; Eds. of Publishing House: N. Ya. Klebanov, and S. L. Orpik; Tech. Ed.: T. V. Polyakova.

PURPOSE: This collection of articles is intended for practicing engineers and research scientists.

COVERAGE: The collection, published by the Institut mashinovedeniya, AN SSSR (Institute of Science of Machines, Academy of Sciences USSR) contains papers presented at the III Vsesoyuznaya konferentsiya po treniyu i iznosu v mashinakh (Third All-Union Conference on Friction and Wear in Machines) which was held April 9-15, 1958. Problems discussed were in 5 main areas: 1) Hydrodynamic Theory of Lubrication and Friction Bearings (Chairmen: Ye. M. Gut'yar, Doctor of Technical Sciences, and A. K. D'yachkov, Doctor of Technical Sciences); 2) Lubrication and Lubricant Materials (Chairman: G. V. Vinogradov, Doctor of Chemical Sciences); 3) Dry and Boundary Friction (Chairmen: B. V. Deryagin, Corresponding Member of the Academy of Sciences USSR, and I. V. Kragel'skiy, Doctor of Technical Sciences); 4) Wear and Wear Resistance (Chairman: M. M. Krushchov, Doctor of Technical Sciences); and 5) Friction and Antifriction Materials (Chairmen: I. V. Kragel'skiy, Doctor of Technical Sciences, and M. M. Krushchov, Doctor of Technical Sciences). Chairman of the general assembly (on the first and last day of the conference) was Academician A. A. Blagonravov. L. Yu. Pruzhanskiy, Candidate of Technical Sciences, was scientific secretary. The transactions of the conference were published in 3 volumes, of which the present volume is the first. This volume contains articles concerning the wear and wear resistance of antifriction materials. Among the topics covered are: modern developments in the theory and experimental science of wear resistance of materials, specific data on the wear resistance of various combinations of materials, methods for increasing the wear resistance of certain materials, the effects of friction and wear on the structure of materials, the mechanism of the seizing of metals, the effect of various types of lubricating materials on seizing, abrasive wear of a wide variety of materials and components under many different conditions, modern developments in antifriction materials, and the effects of finish machining on wear resistance. Many personalities are mentioned in the text. References accompany most of the articles.

Yankevich, V. P. Increasing the Wear Resistance of Steel by Means of Treatment by a Flow of Compressed High-Temperature Gases 93

2. Seizing of Metals. Structural Changes in Metals Due to Friction. Mechanical Properties of Metals.

Ambinder, S. B., and A. S. Franch. On the Mechanism of the Formation and Breakdown of Gripping in the Case of Friction of Metals 99

Vinogradov, Yu. N. Effect of Sulfides on the Friction and Wear of Metals 105

Genkin, M. D., N. F. Kuz'min, and Yu. A. Misharin. Investigation of the Seizing of the Surfaces of Steel Rollers 115

Genkin, M. D., and Yu. A. Misharin. Method for Testing the Antiseizing Capacity of Oils in a Gear Box 122

Card 6/13

7

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, Somen Borisovich; SAVKL'YEVA, Ye., red.; PILADZE, Ye., tekhn.red.

[New methods of pressure welding] Novye sposoby svarki davleniem. Riga, Izd-vo Akad.nauk Latviiskoi SSR, 1960. 114 p.

(Welding) (MIRA 15:2)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, S.B., kand. tekhn. nauk, red.

[Transactions of the First Baltic Region Scientific and Technical Conference on Welding] Trudy Pribaltiiskoi nauchno-tekhnicheskoi konferentsii po svarke, 1st, Riga, 1959. Pod red. S.B. Ainbindera. Riga, TSentr. biuro tekhn. informatsii, 1960. 115 p. (MIRA 15:2)

1. Pribaltiyskaya nauchno-tekhnicheskaya konferentsiya po svarke. 1st, Riga, 1959.

(Welding—Congresses)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, S.B., red.; SAVEL'YEVA, Ye., red.; LEMBERGA, A., tekhn. red.

[Nonlubricated friction; collected articles] Sukhoe trenie; sbornik trudov. Pod red. S.B.Ainbindera. Riga, Izd-vo Akad. nauk Latviiskoi SSR, 1961. 203 p. (MIRA 14:11)

1. Soveshchaniye po voprosam teorii sukhogo treniya i obrazovaniya chastits iznosa pri sukhom trenii, Riga, 1959.
(Friction)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYBINDER, S.B.

Mechanical properties of roughness on metal surfaces. Trudy Sem.po kach.poverkh. no.5:12-20 '61. (MIRA 15:10)
(Surfaces (Technology))

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, S.B. (Riga)

Energy dissipation in a friction contact area during vibration. Izv.AN SSSR.Otd.tekh.nauk.Mekh. i mashinostr. no.4:120-121 Jl-Ag '62. (MIRA 15:8)

(Vibration)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, S.B. (Riga)

Contact area between rubbing bodies. Izv.AN SSSR.Otd.tekh.nauk,Mekh.i mashinostr. no.6:172-174 N-D '62. (MIRA 15:12)
(Friction)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, S.B., kand.tekhn.nauk; TIKHOMIROVA, Ye.K., inzh.

Mechanism of joint formation in ultrasonic welding.
Svar. proiz. no.9:34-37 S '62. (MIRA 15:12)

1. Institut avtomatiki i mekhaniki AN Latviyskoy SSR.
(Ultrasonic welding)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

39758
S/126/62/014/001/017/018
E202/E192

1.2300

AUTHORS: Aynbinder, S.B., and Semenova, G.A.

TITLE: Study of the bonding zone during the pressure welding of metals

PERIODICAL: Fizika metallov i metallovedeniye, v.14, no.1, 1962, 150-151

TEXT: Results are given of metallographic studies of bonded zones resulting from pressure welding of Al-Al (13 x 30 x 5 mm), Cu-Cu (15 x 30 x 3 mm), and steel Ст.1-Ст.1 (St.1-St.1) (15 x 15 x 2 mm). The welding was carried out by compressing with cylindrical dies. The surface of the samples was very carefully cleaned with a rotating brush under strictly controlled conditions. Dies of 8, 6 and 4 mm respectively were used on the above samples, and the relative depth of forcing of the dies was 62, 67 and 75% respectively. After welding, the samples were cut across the weld zone, ground, polished and etched in the case of copper and steel, and electro-polished in the case of aluminium. The investigation included microscopic studies of the weld zone and the measurement of micro-hardness using Vickers pyramid method.

Card 1/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

Afterwards the samples were subjected to recrystallising annealing and had their micro-hardness measured again. The annealing was at 400° for Al, 650° for copper and 840 °C for steel, and the time of holding was 10 min. The cooling was in air, in water and in furnace, respectively. The microscopic observations gave well-defined and detailed picture of the flow of metal and also the extent of weld in a given cross-section, together with the location and quantity of inclusions in the bonding zone of the metal. The weld zone showed characteristic sequence of bonding regions and inclusion regions, the flowing metal surrounding the inclusions. The inclusions were derived from the hard particles formed during the preliminary cleaning with the brush, and it was found that these particles were subjected to a very small deformation pressure. The bond in the case of Al was retained along all its planes of action after the removal of load, and in the case of copper and steel it was retained in its centre only, i.e. in the region of maximal flow. These metallographic studies confirmed the mechanism of cold pressure welding as given by S.B. Aynbinder (Kholodnaya svarka metallov ("Cold welding of

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

Study of the bonding zone during.... S/126/62/014/001/017/018
E202/E192

metals"), Izd. AN Latv.SSR, 1957. Izv. AN Latv. SSR, no.6, 1955, 87. Izv. AN Latv. SSR, no.10, 1954, 113).

There are 4 figures and 2 tables.

ASSOCIATION: Institut avtomatiki i mekhaniki AN Latv. SSR (Institute of Automation and Mechanics, AS Latvian SSR)

SUBMITTED: October 31, 1961.

X

Card 3/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, S.B.; KLOKOVA, E.F.

Determining the adhesion forces between solids. Dokl. AN SSSR 146 no.5:1058-1060 O '62. (MIRA 15:10)

1. Predstavlono akademikom P.A.Rebinderom.
(Adhesion) (Friction)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

S/125/63/000/002/007/010
A006/A101

AUTHOR: Aybinder, S. B.

TITLE: All-Union Conference on cold and ultrasonic welding

PERIODICAL: Avtomaticheskaya svarka, no. 2, 1963, 89

TEXT: The Conference took place in September 1962 in Riga. The following reports were delivered. S. B. Aybinder on new cold welding methods; I. B. Baranc on development of machines for cold welding and necessary measures for introducing this method; A. P. Semenov on problems in the clamping theory; R. K. Glude on the effect of residual stresses and texturation on the strength of joints produced by cold welding; A. S. Pranch on the theory and practice of skew welding; A. Ya. Loginova on the preparation of surfaces for cold welding using carbide powder; Zh. P. Upit and Ya. Yu. Maniks on the welding mechanism; I. M. Stroyman, N. S. Roginskaya, A. G. Markin on the design of new machines and experimental cold welding; V. S. Sedykh and M. P. Voydarov on solid-phase explosion welding; O. V. Syskol'skiy, Yu. V. Kholopov, A. F. Kuybyshev, M. V. Bruk, V. I. Khekalov, Ye. P. Kalinin and others on the design of ultrasonic welding machines. The Conference

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

All-Union Conference on cold and ultrasonic welding

S/125/63/000/002/007/010
A006/A101

decided that the organization of welding machines and tools was a major problem. The lack of ultrasonic welding machines assuring high-quality welds joints was stated.

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, S.B., kand. tekhn. nauk; RASTRIGINA, E.F., kand. tekhn. nauk

Cold spot welding of thin sheet metal. Svar. proizv. no.7: 20-21 Jl '63. (MIRA 17:2)

1. Institut avtomatiki i mekhaniki AN latviyskoy SSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

ACCESSION NR: AP3006765 S/0190/63/005/009/1398/1403

AUTHORS: Aynbinder, S. B.; Rastrigina, E. F.

TITLE: Flow and cohesion of spatially cross-linked polymers

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 5, no. 9, 1963, 1398-1403

TOPIC TAGS: polymer materials, polymer flow, polymer cohesion, spatially structured polymers, Ag 4 plastic, K 17 2 carbolite, M 1 monolith, polystrene, aminoplastic

ABSTRACT: It is commonly accepted that spatially cross-linked polymers do not flow during deformation. However V. A. Kargin, T. I. Sogolova, G. L. Slonimskiy, and Ye. V. Reztsova (Zh. fiz. khimii 30, 1903, 1956) have shown that a certain type of "chemical flow" does occur under a complex stress caused by nonuniform overall compression exerted on an object. Because some machine parts operate under such conditions, a study was undertaken on the flow and cohesion processes in a number of polymer materials, and the article presents the results of this study. The materials tested were: AG-4 plastic, K-17-2 carbolite, M-1 monolith, polystyrene, and aminoplastic. The experimental results showed that plasticity of spatially

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

ACCESSION NR: AP3006765

cross-linked polymers increased sharply under complex stresses, that the strengths of the tested materials diminished due to the appearance of internal defects during deformation, and that the increase of deformation temperature led to the increase in plasticity. Two simultaneously deformed pieces adhered to one another, and the strength of adhesion was about equal to that of a whole sample. The "chemical" flow of spatially cross-linked materials was explained by the healing of defects under the influence of all-sided compression. "K. I. Alksne participated in the experimental work." Orig. art. has: 5 figures.

ASSOCIATION: Institut avtomatiki i mekhaniki AN Latviyskoy SSR (Institute of Automation and Mechanics AN Latvian SSR)

SUBMITTED: 12Mar62 DATE ACQ: 30Sep63 ENCL: 00

SUB CODE: PH, CH NO REF SOV: 006 OTHER: 000

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, S.B.; PRANCH, A.S.

Effect of chemical affinity on the cohesion of metals during friction. Fiz. met. i metalloved. 16 no.5:760-763 N '63. (MIRA 17:2)

1. Institut avtomatiki i mekhaniki AN Latviyskoy SSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

S/0020/64/155/002/0320/0322

ACCESSION NR: AP4022715

AUTHOR: Aymbinder, S. B.; Grinshteyn, A. M.

TITLE: Concerning the carrying capacity of a lubrication film

SOURCE: AN SSSR. Doklady*, v. 155, no. 2, 1964, 320-322

TOPIC TAGS: lubrication film, lubricant, lubrication, lubrication theory, lubricant carrying capacity, plastic film compression

ABSTRACT: The authors give a simple mechanical explanation for the observation that good lubricants have a high resistance to compression of thin lubrication films, and at the same time, a small shear resistance, without the assumption of an anisotropic molecular structure of the film. Under usual conditions of boundary friction, the diameter of individual areas of actual contact is of the order of scores of microns and the thickness of the lubrication film is tenths or thousandths of a micron. Therefore, the authors considered a model in which the compression of a plastic film occurs between two rigid

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

ACCESSION NR: AP4022715

plates. For normal loads, the problem was investigated by L. Prandtl. A formula derived by the authors in a similar way for the axial-symmetric case is compared with the experimental data obtained by Fuks (Coll. Clock Mechanisms, No. 1, 1955). Orig. art. has: 1 figure and 1 table.

ASSOCIATION: Institut mekhaniki polimerov Akademii nauk LatvSSR (Institute for Mechanics of Polymers, Academy of Sciences LatvSSR)

SUBMITTED: 30Oct63 DATE ACQ: 08Apr64 ENCL: 00

SUB CODE: PH NO REF SOV: 003 OTHER: 003

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 24826-65 EPA(s)-2/EWT(m)/EPF(c)/EPR/EWP(j)/T Pc-4/Pr-4/Ps-4/Pt-10 AFWL
RDWA

ACCESSION NR: AP5001979 S/0020/64/159/006/1244/1246

AUTHOR: Aynbinder, S. B.; Laka, M. G.; Mayors, I. Yu.

TITLE: Effect of hydrostatic pressure on the deformation resistance and strength of polymers

SOURCE: AN SSSR. Doklady, v. 159, no. 6, 1964, 1244-1246

TOPIC TAGS: polymer strength, polymer property, hydrostatic pressure

ABSTRACT: The effect of hydrostatic pressure on properties of polymers such as poly(vinyl chloride), plexiglass, amino resin, and ebonite has been studied. Compression and tensile tests at atmospheric and 2000 kg/cm^2 pressure showed that the hydrostatic pressure substantially increases the strength and Young's modulus of all indicated polymers, but has an insignificant effect on elongation, with the exception of amino resin, whose elongation increases from 22% under atmospheric pressure to 35% under a pressure of 2000 kg/cm^2.

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 21826-65

ACCESSION NR: AP5001979

In certain cases the hydrostatic pressure changes the character of fracture. In tensile tests, plexiglass and ebonite failed in a brittle manner at both atmospheric and 2000 kg/cm^2 pressure. However, in the first case the fracture surface was rough and in the second, smooth and perpendicular to the specimen axis. The hardness dropped as a result of deformation regardless of pressure. The ratio of hydrostatic pressure to the Young's modulus was 0.12 for poly(vinyl chloride), 0.097 for plexiglass, 0.116 for ebonite, and 0.05 for amino resin generally higher than that for metals, 0.05 max. Thus the strength potentials of polymers appear to be higher than those of metals. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: Institut Mekhaniki polimerov AN LatvSSR (Institute of Polymer Mechanics, AN LatvSSR)

SUBMITTED: 26May64 ENCL: 00 SUB CODE: OC, MT

NO REF SOV: 003 OTHER: 002 ATD PRESS: 3167

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

AYNBINDER, S.B., kand.tekhn.nauk; LOGINOVA, A.Ya., inzh.; MAKAROV, V.A., inzh.; RASTRIGINA, E.F., kand.tekhn.nauk

Cold welding of metals using hard, finely dispersed particles. Svar. proizv. no.10:28-30 O '64. (MIRA 18:1)

1. Institut avtomatiki i mekhaniki AN Latviyskoy SSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 55047-65 EWT(m)/EPF(j)/EPF/EWP(j)/T Pc-4/Pr-4/Ps-4 RPL WW/RM

ACCESSION NR: AP5011989 UR/0374/65/000/001/0065/0075
678:539.4.01

37
36
B

AUTHORS: Aymbinder, S. B. (Riga); Laka, M. O. (Riga); Mayors, I. Yu. (Riga)

TITLE: Effect of hydrostatic pressure upon the mechanical properties of polymer materials

SOURCE: Mekhanika polimerov, no. 1, 1965, 65-75

TOPIC TAGS: hydrostatic pressure, polymer, tensile strength, modulus of elasticity

15

ABSTRACT: The effect of hydrostatic pressure on the tensile strength of polymethylmethacrylate, vinyl plastics, polystyrene, polycaprolactam, teflon, polyethylene, aminoplastics, K-17-2, VFKP-1, and ebonite was determined. The experimental setup is shown in Fig. 1 on the Enclosure. The modulus of elasticity and the strength limit increase for all materials with increase in hydrostatic pressure. The modulus of elasticity for amorphous plastics and crystalline plastics increases almost linearly with pressure, increasing at a slightly lesser rate at higher pressures. For three-dimensional structural polymers or thermosetting plastics, the modulus of elasticity increases rapidly up to 500 kg/cm^2 and shows a much smaller pressure dependence for higher pressures. From the experimental

Card 1/4

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 35047-65
ACCESSION NR: AP5011989

data it is concluded that the increase in Young's modulus with increase in pressure is due to two reasons: decrease in the specific volume and finiteness of deformation. For thermosetting plastics, the initial rapid increase in Young's modulus is attributed in part to consolidation of the molecular structure. For crystalline and amorphous polymers, E may be calculated with sufficient accuracy for practical purposes by the expression

$$\frac{\Delta E}{E_0} = \frac{\sigma g}{E_0} f(\nu)$$

$$E = E_0 \left(1 + \frac{\sigma g}{E_0} f(\nu)\right),$$

where Eo is the initial value of Young's modulus, g is the hydrostatic pressure in kg/cm^2, and f(ν) is an empirical function of Poisson's coefficient ν. For the high elasticity region, the elastic limit for these types of polymer may be calculated by

$$\sigma_s = \sigma_{s_0}\left[1 + c\,\frac{\sigma_g}{E_0}\right],$$

where σ_s is the elastic limit at the hydrostatic pressure σ_g, σ_0 the initial elastic limit, E_0 initial value of Young's modulus and C an experimental constant.

Card 2/4

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 55047-65
ACCESSION NR: AP5011989

Orig. art. has: 2 tables, 9 graphs, and 7 equations.

ASSOCIATION: none

SUBMITTED: 02Sep64 ENCL: 01 SUB CODE: MT, ME

NO REF SOV: 006 OTHER: 004

Card 3/4

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 55047-65
ACCESSION NR: AP5011989

ENCLOSURE: 01

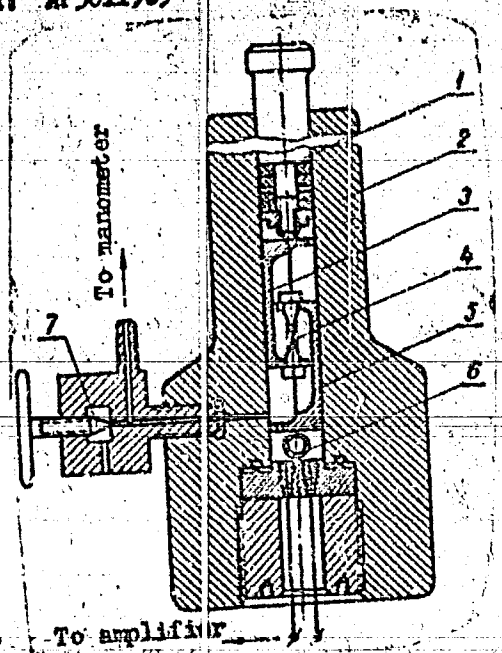


Fig. 1. Schematic of the high pressure chamber used in the determination of the $\sigma|\varepsilon|$ curve as a function of the hydrostatic pressure

Card 4/4

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 58296-65 EWT(d)/EWT(m)/EWP(w)/EPF(c)/EWA(d)/EWP(v)/EPR/EWP(j)/T/EWP(t)/EWP(k)/EWP(b)/EWA(c) Pc-4/Pf-4/Pr-4 JD/HM/HW/EM/RM

ACCESSION NR: AP5009908 UR/0371/65/000/001/0091/0101 50 45 B

AUTHORS: Ainbinder, S. (Aynbinder, S. B.); Glude, R. (Glude, R. K.)

TITLE: Effect of heat treatment and test temperature on the strength of cold-pressure welds

SOURCE: AN LatSSR. Izvestiya. Seriya fizicheskikh i tekhnicheskikh nauk, no. 1, 1965, 91-101

TOPIC TAGS: welding, cold welding, pressure welding, heat treatment, test temperature, rupture strength

ABSTRACT: The cold pressure welded joints were tested essentially for rupture. The characteristics measured were the relative strength [illegible]

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 58296-65
ACCESSION NR: AP5009968

vertex angle of approximately 60°. The strength of the welded stack of discs was tested by tearing one disc away from the other with special clamps. The shear strength of the joint was tested with apparatus described elsewhere (Izv. AN LatvSSR, 1960, No. 4). The results show that cold plastic deformation used to produce cold-pressure welded joints leads to considerable disturbances to the structure of the metal, to the appearance of texture, of oriented defects, residual stresses, etc. Under these conditions the strength of the joints depends to a considerable degree on the sensitivity of the welded material to stress concentration (to notching). When the welds of such materials are heat treated to eliminate the structural defects and the residual stresses, the strength of the joints increases noticeably. Original article has: 5 figures and 1 table.

ASSOCIATION: Institut mekhaniki polimerov AN LatvSSR (Institute of Mechanics of Polymers AN LatvSSR)

SUBMITTED: 12Jun64 ENCL: 00 SUB CODE: MM, AS

NR REF SOV: 013 OTHER: 002

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 69972-65 EWP(k)/EWA(c)/EWT(d)/EWT(m)/EWP(b)/T/EWA(d)/EWP(w)/EWP(v)/EWP(t) Pf-4 EM/JD/HW

ACCESSION NR: AR5017428 UR/0137/65/000/006/E009/E009

SOURCE: Ref. zh. Metallurgiya, Abs. 6E61

AUTHOR: Aynbinder, S. B.; Glude, R. K.

TITLE: The joining of metals which are sensitive to notching

CITED SOURCE: Izv. AN LatvSSR. Ser. fiz. i tekhn. n., no. 6, 1964, 91-99

TOPIC TAGS: cold welding, plastic deformation, material deformation, rupture strength

TRANSLATION: Plastic deformation in cold welding leads to the formation of structural defects in the deformed material; with sensitivity of the metal to notching, these defects bring about a lowering of strength. This effect, in cold welding, brings about the existence of a notch at the point of transition between penetration and no penetration. The strength of cold welded joints in metals sensitive to notching is low. V. Fomenko

SUB CODE: MM ENCL: 00

Card 1/1

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 00788-67 EWP(j)/EWT(m)/T IJP(c) RM/WW

ACC NR: AP6023393 SOURCE CODE: UR/0374/66/000/003/0337/0349

35
B

AUTHOR: Aynbinder, S. B.; Laka, M. G.

ORG: Institute of Mechanics of Polymers, Academy of Sciences Latvian SSR, Riga (Institut mekhaniki polimerov Akademii nauk Latviyskoy SSR)

TITLE: Hardness of polymer materials

SOURCE: Mekhanika polimerov, no. 3, 1966, 337-349

TOPIC TAGS: hardness, polymer

ABSTRACT: Hardness of polymer materials must be estimated by the depth or diameter of nonrestored indentation. The ratio of the diameter of indentation and the diameter of the ball must be larger than 0.8 when balls are used as indentors. Using a pyramid or cone, the angle at the apex must be 60—65°. The hardness of polymer materials was studied, and the relationship between the hardness and the strength and elastic properties was established. Orig. art. has: 9 figures, 12 formulas, and 2 tables. [Based on authors' abstract] [NT]

SUB CODE: 11/ SUBM DATE: 31Dec65/ ORIG REF: 013/ OTH REF: 002/

Card 1/1 UDC: 678.539.53.541.3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 04960-67 EWT(m)/EWP(j) IJP(c) WW/DJ/RM

ACC NR: AP6023395 (A) SOURCE CODE: UR/0374/66/000/003/0355/0358

AUTHOR: Alksne, K. I.; Ayabinder, S. B.; Slonimskiy, G. L.

ORG: Institute of Polymer Mechanics, Academy of Sciences, Latvian SSR, Riga (Institut mekhaniki polimerov Akademii nauk Latviyskoy SSR)

41
B

TITLE: Effect of hydrostatic pressure on the density of certain polymer materials

SOURCE: Mekhanika polimerov, no. 3, 1966, 355-358

TOPIC TAGS: hydrostatic pressure, material deformation, thermoplastic material

ABSTRACT: Compression tests were performed on (1) amorphous thermoplastics which are in the vitreous state at room temperature (organic glass and vinyl plastic), (2) crystalline thermoplastics (kapron and high-pressure polyethylene) and (3) space-network thermoplastics (ebonite and FKP-1). The tests were carried out at atmospheric pressure (1 kg/cm^2) and hydrostatic pressures of 500, 1000 and 1500 kg/cm^2. The average deformation rate was 5 mm/min. The application of hydrostatic pressure was found to cause an increase in the density of ebonite and caused virtually no change in the density of the other materials. At sufficiently high deformations, uniaxial compression decreased the average density of all the polymers; the rate of decrease in density falls off when the materials are simultaneously acted upon by hydrostatic pressure. In the compression of vinyl plastic, organic glass and ebonite, a considerable increase in density is observed as the deformation increases up to values of the order

Card 1/2 UDC: 678:531.424

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 04960-67

ACC NR: AP6023395

of 23%, i. e., until the height (h) of the specimens becomes equal to their diameter (d); this is attributed to a change in the stress condition, which changes when $\frac{d}{h} = 1$. Orig. art. has: 6 figures.

SUB CODE: 11/ SUBM DATE: 07Dec65/ ORIG REF: 010

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 46964-66 EWP(e)/EWT(m)/EWP(t)/ETI/EWP(k) IJP(c) JD/JH

ACC NR: AT6024929 (P,N) SOURCE CODE: UR/2981/66/000/004/0192/0201

AUTHOR: Aynbinder, S. B.; Andreyeva, N. G.; Rastrigina, E. F.

ORG: none

TITLE: Preparation of finely divided aluminum powder by electroerosion

SOURCE: Alyuminiyevyye splavy, no. 4, 1966. Zharoprochnyye i vysokoprochnyye splavy (Heat resistant and high-strength alloys), 192-201

TOPIC TAGS: electroerosion, aluminum powder

ABSTRACT: The object of the work was to obtain aluminum powder of maximum dispersity and minimum oxide content. To this end, use was made of one of the methods of electroerosion, viz., spraying in a high-frequency spark discharge in liquid media. Distilled water, ethanol, CO_2-saturated ethanol, benzene, and glycerin were tested as the dispersion media at 0, 20, and 3-40°C. The maximum aluminum content of the powder was 82%. Ethanol was found to be the best dispersion medium. The temperature of the medium and the time spent by the particles in the discharge zone determine the degree of oxidation of the powder. The content of carbon in the powder obtained from ethanol was 3%, that of hydrogen, 1.5%, and that of nitrogen, 0.5%. The bulk of the particles formed as a result of condensation processes, and their size ranged from 0.01 to 0.2 μ. Approximately 20% of the particles formed by dispersion processes, and their size was

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 45954-66

ACC NR: AT6024929

0.2 to 15 μ. Orig. art. has: 5 figures and 1 table.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 010/ OTH REF: 001

Card 2/2 mt

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 46965-66 EWT(m)/EWP(t)/ETI IJP(c) JD/JH

ACC NR: AT6024931 (A,N) SOURCE CODE: UR/2981/66/000/004/0208/0213

AUTHOR: Aynbinder, S. B.; Loginova, A. Ya.; Rastrigina, E. F.

ORG: none

35
B+1

TITLE: Preparation of a surface layer similar to SAP

SOURCE: Alyuminiyevyye splavy, no. 4, 1966. Zharoprochnyye i vysokoprochnyye splavy (Heat resistant and high-strength alloys), 208-213

TOPIC TAGS: sintered aluminum powder, metal surface, surface finishing

ABSTRACT: A mechanism is proposed to account for the formation of a layer of SAP (sintered aluminum powder) on the surface of aluminum during its treatment with a rotating wire brush. The properties of this layer (hardness, chemical composition, oxidation resistance at high temperatures) were studied. It is shown that the hardness of the surface layer increases from 145 kg/mm^2 to 200 kg/mm^2 as the diameter of the brush wire decreases from 0.4 to 0.12 mm. It is also shown that the increase in the hardness of the layer with decreasing wire diameter is in accord with the increased oxide content of the layer. It is pointed out that by treating the surface of metals with a rotating wire brush and suitably selecting the brush material, one can alloy the surface layer of some metals. Thus, for example, a 1-min treatment of nickel and gold with a brush having steel wires 0.3 mm in diameter and rotating at 28 m/sec produces a layer containing 1-10% Fe. No iron is observed on aluminum and very little is

Card 1/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

L 46963-66

ACC NR: AT6024931

found on copper. Orig. art. has: 5 figures.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 007/ OTH REF: 004

Card 2/2 mt

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8

REEL #26

AVERBUKH, S.S.
to
AYNBINDER, S.B.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102630001-8"