The Asymptotic Behavior of the Eigenfunctions of the Equation $\Delta u + k^2 u = 0$ With Boundary Conditions Along Equidistant Curves and the Scattering of Electromagnetic Waves in a Wave Guide

explicitly written down and may be considered to be a double asymptotic curve. This formula describes the asymptotic curve of the eigenfunctions of the initially given equation $\Delta\psi_k + k^2\psi_k = 0$ for $k \to \infty$. The proof for the formula given for the asymptotic curve is outlined. Case c) is also suited for the investigation of a plane curved tubular conductor. In this case the asymptotic curve at $k \to \infty$ corresponds to geometrical optics. The variant a) is suited for the investigation of the scattering of electromagnetic waves in a straight coaxial line with arbitrary cross section. The author thanks A. G. Sveshnikov and E. G. Poznyak for their advice and assistance.There are 4 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SOV/20-123-4-14/53

The Asymptotic Behavior of the Eigenfunctions of the Equation $\Delta u + k^2 u = 0$ With Boundary Conditions Along Equidistant Curves and the Scattering of Electromagnetic Waves in a Wave Guide

PRESENTED: July 2, 1958, by N. N. Bogolyubov, Academician

SUBMITTED: June 24, 1958

Card 3/3

21(1), 24(7) SOV/51-6-5-25/34

AUTHORS: Glasko, V.B., Maslov, V.P., Panikar, V.I. and Sokolov, N.D.

TITLE: On the Type of Correlation Function for the Helium Atom (O vide korrelyatsionnoy funktsii dlya atoma geliya)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 5, pp 698-700 (USSR)

ABSTRACT: In molecular calculations correlation in the motion of electrons is allowed for by introducing into the wave-function an additional factor dependent on inter-electron distance r_{ij} (Ref. 1).
In analogy with the first approximation in the helium atom calculations, carried out by Hylleraas (Ref 2), this multiplier can be written for a two-electron system in the form

$$f(r_{12}) = 1 + dr_{12} \qquad (1)$$

where d is a variational parameter. In the general case the correlation function should depend on three correlation variables and f can be then represented as a series in powers of these variables (Refs 2, 3). When only one correlation variable is used the choice of the function $f(r_{12})$ in the form given by Eq (1) is an arbitrary one. The question arises as to whether this choice is the best possible one. This question is answered by determining the correlation function $f(r_{12})$ for the helium

Card 1/2

On the Type of Correlation Function for the Helium Atom

atom by a variational method. The result is shown as curve I in a figure on p 700; curve II represents the Hylleraas function given by Eq (1). Both curves are plotted as functions of distance in atomic units. The figure shows clearly that the correlation function approximation in the form of Eq (1) is practically the best choice, at least for atoms. The paper is entirely theoretical. There are 1 figure and 6 references, 3 of which are Soviet, 1 English, 1 German and 1 mixed (Soviet, English and French).

SUBMITTED: November 29, 1958

16(1)
AUTHOR: Maslov, V.P.

SOV/42-14-3-11/22

TITLE: Applications of Functional Analytical Methods for the Construction of the Quasi-Classical Asymptotic Behavior of the Solution of the Schrödinger Equation

PERIODICAL: Uspekhi matematicheskikh nauk, 1959, Vol 14, Nr 3, pp 161-168 (USSR)

ABSTRACT: By the generalized solution of the Cauchy problem for

$$(1)\ L\psi = i\hbar\frac{\partial\psi}{\partial t} - H\psi = i\hbar\frac{\partial\psi}{\partial t} + \frac{\hbar^2}{2\mu}\frac{\partial^2\psi}{\partial x^2} - u(x)\psi$$

the author understands the function

$$\psi(x,t) = e^{\frac{i}{\hbar}Ht}\psi(x,0)$$

if $\psi(x,0)$ is the initial vector. Let $u(x)$ be three times differentiable, $u(+\infty) = u(-\infty) = \infty$; let the equation $u(x) = E$ have two roots $x_1(E)$, $x_2(E)$ for $E>0$. Let the initial condition be

Card 1/4

Applications of Functional Analytical Methods for the Construction of the Quasi-Classical Asymptotic Behavior of the Solution of the Schrödinger Equation

SOV/42-14-3-11/22

(2) $\psi(x,0) = p(x)^{-\frac{1}{2}} F(x)$, $F(x) = \varphi(x)e^{\frac{i}{h}S(x)}$;

where $p(x) = \sqrt{2\mu[E - u(x)]}$ is the classical impulse,

$S(x) = \int_{x_1}^{x_2} p\,dx$, $\varphi(x)$ an arbitrary function vanishing outside of $[x_1(E) , x_2(E)]$ and satisfying the condition

$$\int_{x_1}^{x_2} p^{-1} |\varphi(x)|^2 dx < \infty .$$

Theorem : The solution of (1) - (2) admits the representation:

$$\psi(x,t) = p^{-\frac{1}{2}}(x) F[X(x,t)] + z(h) ;$$

Card 2/ 4

Applications of Functional Analytical Methods for the Construction of the Quasi-Classical Asymptotic Behavior of the Solution of the Schrödinger Equation

30V/42-14-3-11/22

here $X(x,t)$ is the solution of $\mu\ddot{X} = -n'(X)$ which satisfies the initial condition $X|_{t=0} = x$, $\dot{X}|_{t=0} = \frac{p(x)}{\mu}$ and $\| z(h) \|_{L_2} \to 0$. The further details are valid for the case that H is defined on a finite interval $[a,b]$, whereby the eigenfunctions vanish in the final points of the interval. The author defines a space, on the functions of which the quantum mechanic operators change over into classical ones, so that the defined space is decomposed into two spaces which are invariant in the limit with respect to the direction of the impulses. In some similar cases the author gives asymptotic representations for the eigen values and eigenfunctions of H and for the solution of the Cauchy problem

Card 3/4

Applications of Functional Analytical Methods for the Construction of the Quasi-Classical Asymptotic Behavior of the Solution of the Schrödinger Equation SOV/42-14-3-11/22

for (1). Altogether there are 3 theorems. The author thanks A.N. Tikhonov, S.V. Fomin and M.I. Vishik for several valuable suggestions.
There are 8 references, 6 of which are Soviet, 1 American, and 1 Hungarian.

SUBMITTED: January 26, 1957

Card 4/4

16(1)

AUTHOR: Maslov, V.P. SOV/42-14-4-15/27

TITLE: On Some Methods of Functional Analysis in the Theory of Operator Equations and Partial Differential Equations With Parameters

PERIODICAL: Uspekhi matematicheskikh nauk, 1959,Vol 14,Nr 4,pp 179-186 (USSR)

ABSTRACT: Let T be a linear operator in the Hilbert space H with a dense region of definition D(T). Let there exist the closure $\overline{T}$ of T and let it be T^{**}. The author considers a sequence of such operators T_n, where $D(T_n)$ does not depend on n. Let there exist the strong limit value $T = \lim_{n\to\infty} T_n$ with the region of definition $D(T) = D(T_n)$.

Theorem: Let $T = \lim T_n$. 1) If there exist uniformly bounded inverse operators $\overline{T}_n^{-1}$, then there also exists $\overline{T}^{-1}$; it is defined on the orthogonal complement of the set of solutions of $T^*x = 0$. Here $\{\overline{T}_n^{-1}\}$ converges strongly to $\overline{T}^{-1}$ on this subspace. 2) If x_0 satisfies the equation $Tx_0 = 0$ and there exist operators $S_n \subset T_n$

Card 1/3

(i.e. $D(S_n) \subset D(T_n)$, $T_n S_n^{-1} = 1$), where the S_n^{-1} are uniformly bounded, then there exists a sequence $\{x_n\}$ of solutions of $T_n x_n = 0$ which converges strongly to x_0.

Theorem: Let $T = \lim T_n$. If there exists a bounded sequence $\{x_n\}$ of solutions of the equations $T_n^* x_n = f_n$, where $\{f_n\}$ converges weakly to an f, then there exists a sequence $\{y_n\}$ of solutions of $T^* y_n = f$ so that $\{x_n - y_n\}$ converges weakly to zero.

Let $T_n = \varepsilon(n)[A_1 + K_n A_2] + M_n$, $L_n = \varepsilon(n) A_1 + M_n$, where $\varepsilon(n)$ is a bounded number sequence and $\{M_n\}$, $\{K_n\}$ are uniformly bounded sequences of operators.

Theorem: Let $\lim_{n \to \infty} \|K_n\| = 0$, $D(A_2) \supseteq D(A_1)$.

1. If $\{L_n^{-1}\}$ is uniformly bounded, then

$$\| T_n^{-1} - L_n^{-1} \sum_{0}^{N} (-1)^k [\varepsilon(n) K_n A_2 L_n^{-1}]^k \| \leq [\alpha \| K_n \|]^{N+1} ,$$

Card 2/3

where α does not depend on n and N.

2. Let $\{x_n\}$ be the sequence of solutions of $L_n x_n = 0$. Let there exist operators $S_n \subset L_n$ so that $\{S_n^{-1}\}$ is uniformly bounded. Then for a sufficiently large n

$$y_n = \sum_{k=0}^{\infty} (-1)^k \left[\varepsilon(n) S_n^{-1} K_n A_2\right]^k x_n$$

are solutions of $T_n y_n = 0$, where

$$\left\| y_n - \sum_{k=0}^{N} (-1)^k \left[\varepsilon(n) S_n^{-1} K_n A_2\right]^k x_n \right\| \leq \left(\beta \| K_n \|\right)^{N+1},$$

where β does not depend on n and N.

Putting $\varepsilon(n) \equiv 1$, $M_n \equiv 0$, $K_n = \varepsilon$, then from this theorem it follows the existence of a solution of the equation $(A_1 + \varepsilon A_2)x_\varepsilon = 0$ which depends analytically on ε.

The author thanks A.N.Tikhonov, S.V.Fomin, and A.A.Dezin for discussions.

There are 7 references, 4 of which are Soviet, 1 German, and 2 Hungarian.

16.8100

77808
SOV/42-15-1-15/27

AUTHOR: Maslov, V. P.

TITLE: On the Transition of Quantum Mechanics Into Classical in the Multidimensional Case

PERIODICAL: Uspekhi matematicheskikh nauk, 1960, Nr 1, pp 213-220 (USSR)

ABSTRACT: In application of methods of functional analysis in the construction of quasi-classical asymptotics of the solution of Schrödinger's equation Usp. mat. nauk, XIV, Nr 3 (87) (1959) 161-168), the author shows that in the one-dimensional case for $h \longrightarrow 0$, the quantum mechanics operators go into classical expressions. Here the unitary Schrödinger operator converges to the unitary operator corresponding to a dynamic system of fixed energy. In this paper the author extends some results of this study to the multidimensional case. For simplicity the two-dimensional case is considered.

Card 1/7

On the Transition of Quantum Mechanics Into Classical in the Multidimensional Case

77808
SOV/42-15-1-15/27

$$-ih\frac{\partial\psi}{\partial t} = -\frac{h^2}{2\mu}\Delta\psi + U(x, y)\psi = 0. \qquad (1)$$

where the potential energy U(x,y) is sufficiently smooth. Let $\Omega = (-s_1 \leqslant s \leqslant s_2 \times 0 \leqslant \tau \leqslant T)$ be a domain and L_2 be the a Hilbert space of functions for which the scalar is defined as

$$(f_1, f_2) = \int f_1 \cdot f_2 dx dy, \quad f_1, f_2 \in L_2, \qquad (4)$$

$L_2(\Omega)$, $\widetilde{L}_2(\Omega)$ are Hilbert spaces with scalar products given respectively by

Card 2/7

On the Transition of Quantum Mechanics Into Classical in the Multidimensional Case

77808
SOV/43-15-1-15/2

$$(f_1, f_2)_{L_2(\Omega)} = \int_{\Omega} f_1 \cdot f_2 \, dx \, dy, \quad f_1, f_2 \in L_2(\Omega),$$
$$(\tilde{f}_1, \tilde{f}_2)_{\tilde{L}_2(\Omega)} = \int_{\Omega} \tilde{f}_1 \cdot \tilde{f}_2 \, dx \, ds, \quad \tilde{f}_1, \tilde{f}_2 \in \tilde{L}_2(\Omega) \qquad (4)$$

Let $L_2(\Omega_t)$ be the Hilbert space defined on $\Omega_t = (-s_1 \leqslant s \leqslant s_2 \times 0 \leqslant \tau \leqslant T - t)$ with scalar product defined by

$$(\tilde{f}_1, \tilde{f}_2)_{\tilde{L}_2(\Omega_t)} = \int_{\Omega_t} \tilde{f}_1 \cdot \tilde{f}_2 \, dx \, ds, \quad \tilde{f}_1, \tilde{f}_2 \in \tilde{L}_2(\Omega_t). \qquad (5a)$$

Card 3/7

On the Transition of Quantum Mechanics Into Classical in the Multidimensional Case

77808
SOV/42-15-1-15/27

In L_2 consider the operators

$$p_x = -ih\frac{\partial}{\partial x}, \quad p_y = -ih\frac{\partial}{\partial y},$$

$$H = -\frac{h^2}{2\mu}\Delta + V(x, y) \quad \text{и} \quad e^{\frac{i}{h}Ht}.$$

The operators p_x, p_y, and H are defined everywhere in L_2 and vanish on the boundary with the necessary number of derivatives. The operator $e^{\frac{i}{h}Ht}$

Card 4/7

is defined everywhere in $L_2(\Omega)$. In $\widetilde{L}_2(\Omega)$ introduce the translation operator

$$Q_t f(s, \tau) = f(s, t+t)$$

with domains of definition in $L_2(\Omega_t)$. The measure

$$d\nu\, dt = \frac{D(\tau, s)}{D(x, y)} \left| \frac{p}{I(x, y)} \right| dx\, dy$$

$$= \frac{1}{I} \left| \frac{p}{I(x, y)} \right| dx\, dy = \varphi(x, y)\, dx\, dy \quad (6)$$

Where

$$J = \frac{D(\tau, s)}{D(x, y)}$$

will be invariant relative to the operator $\ldots$. Analogous to the one dimensional case introduce the operator

Card 5/7

$$M \{\varphi(x, y)\} = \ldots$$

On the Transition of Quantum Mechanics Into Classical in the Multidimensional Case

77808
SOV/42-15-1-15/27

Theorem: The operators $M^{-1} p_x M$, $M^{-1} p_y M$, $M^{-1} HM$, for $h \longrightarrow o$ converge respectively to the operators $\partial\theta/\partial x$, $\partial\theta/\partial y$, and E. The operator $M^{-1} (\frac{H-E}{h}) M$ converges to the operator $i \frac{\partial}{\partial t}$ and also

$$\| U_t - U(Q_t) \| \leq z(h) \qquad (7)$$

for all $f \in D(Q_t)$, where $z(h)$ converges strongly to zero in L_2 for $h \longrightarrow o$. Here

$$\eta = \int_0^t \| \partial U / \partial \tau - i Q(\tau) U \| d\tau$$

Card 6/7

is the classical action; $T = \frac{\partial \theta}{\partial e}$ is classical time; $\frac{\partial \theta}{\partial x}$ and $\frac{\partial \theta}{\partial y}$ are components of the classical impulse. A corollary of (7) is

where $e^{\frac{i}{h}Ht} f(q) e^{-\frac{i}{h}\theta} = f(q) e^{-\frac{i}{h}(\theta + Et)} Q_t f + z(h)$, (16)
$\| z(h) \|_{L_2} \to 0$, and $f \in L_2(\Omega_t)$.

The author expresses gratitude to S. V. Fomin for valuable comments. There are 8 references, 2 U.S., 6 Soviet, 1 Hungarian. The U.S. reference is: R. S. Phillips, Perturbation Theory for Semigroups of Linear Operators, Trans. Ames. Math. Soc., 74 (1953) 199-231.

SUBMITTED: June 8, 1959

MASLOV, V.P. (Moskva)

Quasi-classical asymptotic solutions of certain problems of mathematical physics. Zhur. vych. mat. i mat. fiz. 1 no.1:113-128 Ja-F '61. (MIRA 14:8)
(Asymptotes) (Mathematical physics) (Boundary value problems)

MASLOV, V.P. (Moskva)

Quasi-classical asymptotic method of solution of certain problems in mathematical physics. Zhur.vych.mat.i mat.fiz. 1 no.4:638-663 Jl-Ag '61. (MIRA 14:8)

(Boundary value problems) (Differential equations) (Mathematical physics)

24.1000

S/046/61/007/001/007/015
B104/B204

AUTHORS: Maslov, V. P., Tartakovskiy, B. D.

TITLE: The passage of bending waves through an intermediate rod

PERIODICAL: Akusticheskiy zhurnal, v. 7, no. 1, 1961, 67-72

TEXT: The passage of pure bending waves from a unilaterally unbounded rod into another via an arbitrary intermediate rod, which is firmly connected with the two afore-mentioned parts is studied. Two types of bending waves are known to exist: the traveling waves and the inhomogeneous waves. During passage through one of the two above-mentioned connections between the three rods, both types of waves are partly reflected, and partly they pass through. For calculating the reflection and transition coefficients of the intermediate rod, it is necessary that the system consisting of eight linear equations be solved. This system reads

$$1 + \mathfrak{R}_0 + R_0 = D_1 + \mathfrak{D}_1 + \mathfrak{R}_1 e^{-k_1 l} + R_1 e^{ik_1 l}$$

$$k_0 (l + \mathfrak{R}_0 - iR_0) = k_1 (iD_1 - \mathfrak{D}_1 + \mathfrak{R}_1 e^{-k_1 l} - iR_1 e^{ik_1 l})$$

Card 1/4

$$B_0 k_0^2 (-1 + \mathfrak{R}_0 - R_0) = B_1 k_1^2 (-D_1 + \mathfrak{D}_1 + \mathfrak{R}_1 e^{-k_1 l} - R_1 e^{ik_1 l})$$

$$B_0 k_0^3 (-i + \mathfrak{R}_0 + iR_0) = B_1 k_1^3 (-iD_1 - \mathfrak{D}_1 + \mathfrak{R}_1 e^{-k_1 l} + iR_1 e^{ik_1 l}) \quad (3)$$

The passage of ...

$$D_1 e^{ik_1 l} + \mathfrak{D}_1 e^{-ik_1 l} + \mathfrak{R}_1 + R_1 = D_2 + \mathfrak{D}_2$$

$$k_1 (iD_1 e^{ik_1 l} - \mathfrak{D}_1 e^{-ik_1 l} + \mathfrak{R}_1 - iR_1) = k_2 (iD_2 - \mathfrak{D}_2)$$

$$B_1 k_1^2 (- D_1 e^{ik_1 l} + \mathfrak{D}_1 e^{-ik_1 l} + \mathfrak{R}_1 - R_1) = B_2 k_2^2 (- D_2 + \mathfrak{D}_2)$$

$$B_1 k_1^2 (-iD_1 e^{ik_1 l} - \mathfrak{D}_1 e^{-ik_1 l} + \mathfrak{R}_1 + iR_1) = B_2 k_2^2 (- iD_2 - \mathfrak{D}_2).$$

Here, D and $\mathfrak{D}$ are the amplitudes of the direct, of the reflected traveling and inhomogeneous waves, R and $\mathfrak{R}$ are the amplitudes, the indices 0, 1, and 2 denote the corresponding rods; l is the length of the intermediate rod; B_i is the bending strength of the i-th rod; and k_i is the wave number. The determinant of this system is written down, and by means of the rule established by Sarrus, expressions are obtained, which become much too difficult for purposes of calculation. By introduction of the operators

$$R_{12} = \frac{i\mathcal{P}_{(q,b}}{\mathcal{P}_{q,b}}; \quad \mathfrak{R}_{12} = (1+i)\frac{M^{(-)}_{q,b}}{\mathcal{P}_{q,b}}; \qquad (11)$$

$$D_{12} = \frac{2q^3 bQ_{q,b}}{\mathcal{P}_{q,b}}; \quad \mathfrak{D}_{12} = -i\frac{2q^3 bQ_{(q,b}}{\mathcal{P}_{q,b}}.$$

Card 2/4

The passage of ...

in which x may assume the values $i^n p$, $i^n q$ ($n = 0, 1, 2, 3$), and y the values a and b, the expressions for the four coefficients may be considerably simplified. In this way, the relations

$$R_{02} = i \frac{\sum_{n=0}^{3} \mathcal{P}_{i^{n-1}p,\,a} P_{i^n} - 4M^{(-)}_{p,a} M^{(-)}_{q,b}}{\sum_{n=0}^{3} \mathcal{P}_{i^n p,\,a} P_{i^n} - 4M^{(-)}_{p,a} M^{(-)}_{q,b}}; \qquad (6)$$

$$\mathfrak{R}_{02} = -(1+i) \frac{M^{(-)}_{p,a} \sum_{n=0}^{3} P_{i^n} - 4M^{(+)}_{p,a} M^{(-)}_{q,b}}{\sum_{n=0}^{3} \mathcal{P}_{i^n p,a} P_{i^n} - 4M^{(-)}_{p,a} M^{(-)}_{q,b}}; \qquad (7)$$

$$D_{02} = \frac{\frac{4q^2 b}{p} \sum_{n=0}^{3} i^n Q_{i^n p,\,a} Q_{i^n q,\,b} e^{i^n \varphi}}{\sum_{n=0}^{3} \mathcal{P}_{i^n p,\,a} P_{i^n} - 4M^{(-)}_{p,a} M^{(-)}_{q,b}}; \qquad (8)$$

$$\mathfrak{D}_{02} = -\frac{\frac{4q^2 b}{p} \sum_{n=0}^{3} i^{n+1} Q_{i^n p,a} Q_{i^{n+1} q,\,b} e^{i^n \varphi}}{\Sigma \mathcal{P}_{i^n p,\,a} P_{i^n} - 4M^{(-)}_{p,a} M^{(-)}_{q,b}}. \qquad (9)$$

Card 3/4

The passage of ...

are obtained, which, in the case of a suitable selection of the parameters permit calculation of the corresponding coefficients. Equation (6) may further be used for determining the conditions at which bending waves are not reflected from the intermediate rod. It is shown that with a certain material of the intermediate rod, by suitable selection of its thickness, a total reflection-free passage of the bending waves may be attained. In the same way, the condition for the lack of a reflection of the inhomogeneous waves on the intermediate rod is formulated. There are 6 references: 1 Soviet-bloc.

ASSOCIATION: Akusticheskiy institut AN SSSR Moskva (Institute of Acoustics of the AS USSR, Moscow)

SUBMITTED: May 29, 1960

MASLOV, V.P.; TARTAKOVSKIY, B.D.

Transit of flexural waves across an intermediate rod, involving losses. Akust.zhur. 7 no.2:224-227 '61. (MIRA 14:7)

1. Akusticheskiy institut AN SSSR, Moskva.
(Sound--Transmission)

MASLOV, V.

Comments on the asymptotic nature of the eigenfunctions of Schrödinger's equation. Usp. mat. nauk 16 no.4:253-254 Jl-Ag '61. (MIRA 14:8)

(Eigenfunctions) (Wave mechanics)

S/046/62/008/002/006/016
B104/B138

AUTHORS: Maslov, V. P., Tartakovskiy, B. D.

TITLE: Propagation of flexural vibrations in several inhomogeneous rods

PERIODICAL: Akusticheskiy zhurnal, v. 8, no. 2, 1962, 194 - 198

TEXT: The problem is the propagation of transverse waves in a series of rods, connected by butt joints. Each rod satisfies the conditions of pure bending and has arbitrary elasticity parameters and cross section. No rod is less than one and a half times the lengths of a transverse wave. Using this condition, the coefficients of reflection and transmission of the transverse wave potentials through n intermediate rods can be calculated with the aid of recurrence formulas:

$$R_{0,n+1} = \frac{R_{0n} + (D_{0n}D_{n0} - R_{0n}R_{n0})R_{n,n+1}e^{i2\varphi_n}}{1 - R_{n0}R_{n,n+1}e^{i2\varphi_n}}, \quad (1) - (2).$$

$$D_{0,n+1} = \frac{D_{0n}D_{n,n+1}e^{i\varphi_n}}{1 - R_{n0}R_{n,n+1}e^{i2\varphi_n}},$$

Card 1/3

Propagation of flexural vibrations...

The transmission and reflection coefficients of the entire system of rods can be calculated from

$$R_{0,\,n+1} = Q_n / S_n, \qquad D_{0,\,n+1} = N_n / S_n, \qquad (8) - (9)$$

where

$$S_n = 1 - \sum_{q=1}^{n}\sum_{p=1}^{q} P_{pq} + \sum_{s=1}^{n-2}\sum_{r=1}^{s}\sum_{q=1}^{r}\sum_{p=1}^{q} P_{r+2,\,s+2}P_{pq} -$$

$$- \sum_{u=1}^{n-4}\sum_{t=1}^{u}\sum_{s=1}^{t}\sum_{r=1}^{s}\sum_{q=1}^{r}\sum_{p=1}^{q} P_{t+4,\,u+4}P_{r+2,\,s+2}P_{pq} + \ldots,$$

$$Q_n = \sum_{p=1}^{n+1} T_{p-1} - \sum_{r=1}^{n-1}\sum_{q=1}^{r}\sum_{p=1}^{q} P_{q+1,\,r+1}T_{p-1} + \qquad (10) - (12)$$

$$+ \sum_{o=1}^{n-3}\sum_{u=1}^{m}\sum_{r=1}^{u}\sum_{q=1}^{r}\sum_{p=1}^{q} P_{u+3,\,o+3}P_{q+1,\,r+1}T_{p-1} - \ldots,$$

$$N_n = \prod_{i=0}^{n} D_{i,\,i+1}\, e^{i\sum_{k=1}^{n}\varphi k}.$$

Card 2/3

and выражениях (10) — (12) приняты сокращения:

$$P_{pq} = R_{p,\,p+1}R_{q,\,q-1}e^{i2\sum_{k=1}^{q}\varphi_k}, \quad T_p = R_{p,\,p+1}e^{i2\sum_{k=1}^{p}\varphi_k}.$$

Despite the above restrictions, results obtained from these formulas for rods only half the wavelength, deviate from the experimental results by only 10%.

ASSOCIATION: Akusticheskiy institut AN SSSR Moscow (Acoustics Institute AS USSR, Moscow)

SUBMITTED: April 26, 1961

MA... V. V. T.

L 45809-65 EWT(d)/T IJP(c)

ACCESSION NR AM4043734 BOOK EXPLOITATION

8/ 30 B11

Vilenkin, N. YA.; Gorin, YE. A.; Kostyuchenko, A. G.; Krasnosel'skiy, M. A.; Kreyn, S. G.; Maslov, V. P.; Mityagin, B. S.; Petunin, YU. I.; Rutitskiy, YA. B.; Sobolev, V. I.; Stetsenko, V. YA.; Faddeyev, L. D.; Tsitlandze, E. S.

Functional analysis (Funktsional'nyy analiz), Moscow, Izd-vo "Nauka", 1964, 424 p. biblio., index. Errata slip inserted. 17,500 copies printed. Series note: Spravochnaya matematicheskaya biblioteka.

TOPIC TAGS: functional analysis, mathematics, operator equation, quantum mechanics, Hilbert space, Banach space, linear differential equation

PURPOSE AND COVERAGE: This issue in a series of Handbooks of the Mathematical Library contains much material grouped basically around the theory of operators and operator equations. It presents the basic concepts and methods of functional analysis, theory of operators in Hilbert space and in conical space, the theory of nonlinear operator equations, the theory of standard rings applied to equations in partial derivatives, to integral equations. A separate chapter is devoted to the basic operator of quantum mechanics. Citing of the theory of generalized functions takes up a large part of the book. The book explains mathematical facts; theorems and formulas, as a rule, are given

Card 1/2

L 45809-65
ACCESSION NR AM4043734

without proofs. Main attention is given to concepts without excessive detail. The book is intended for mathematicians, mechanical engineers, and physicists. It contains much of value for students and graduate students.

TABLE OF CONTENTS [abridged]:

SUBMITTED: 06Feb64 SUB CODE: MA

NO REF SOV: 038 OTHER: 012

Card 2/2

MASLOV, V.P.; FOMIN, S.V., red.

[Perturbation theory and asymptotic methods] Teoriia vozmushchenii i asimptoticheskie metody. Moskva, Izd-vo Mosk. univ., 1965. 549 p. (MIRA 19:1)

MASLOV, V.P.

Behavior in the large of the solutions to equations in mathematical physics and the Morse index. Usp. mat. nauk 20 no.4:193 Jl-Ag '65. (MIRA 18:8)

MASLOV, V.P.

Asymptotic behavior of eigenvalues of the Schrödinger operator. Usp. mat. nauk 20 no.6:134-138 N-D '65. (MIRA 18:12)

1. Submitted June 13, 1963.

L 36538-66 EWT(d)/EWT(l)/EWT(m)/EWP(w) IJP(c) EM/WW

ACC NR: AP6016825 (N) SOURCE CODE: UR/0046/66/012/002/0167/0172

AUTHOR: Bobrovnitskiy, Yu. I.; Maslov, V. P.

ORG: State Scientific Research Institute of the Science of Machines, Moscow (Gosudarstvennyy n.-i. institut mashinovedeniya)

TITLE: Propagation of flexural waves along a rod with periodic concentrated load

SOURCE: Akusticheskiy zhurnal, v. 12, no. 2, 1966, 167-172

TOPIC TAGS: flexural vibration, wave propagation, periodic system, dispersion equation, acoustic effect

ABSTRACT: In view of the fact that earlier investigations were restricted to specific systems and their results cannot be readily generalized, the authors solve the problem of propagation of flexural waves in an infinite rod with arbitrary periodic concentrated load by using a method in which a general dispersion equation is obtained in a form convenient for analysis. In this method the propagation of the flexural wave is treated as the interaction of a homogeneous rod and a load by means of forces and moments of the reaction forces. This makes it possible to express the harmonic motion of the homogeneous rod under the influence of these forces and moments, as well as the motion of the load, in terms of a certain second-order matrix, so that the rod and the load can be treated like two-port networks, and the dispersion equation is the equation for the natural frequencies of the coupling of these two-port networks. Cases of zero load and of inertial and elastic loads are considered.

Card 1/2 UDC: 534.113

L 36538-66

ACC NR: AP6016825 2

A discrete model of the homogeneous and loaded rods is presented on the basis of the results. The authors thank A. V. Rimskiy-Korsakov and M. D. Genkin for continuous interest. Orig. art. has: 1 figure and 11 formulas.

SUB CODE: 20/ SUBM DATE: 22Sep64/ OTH REF: 007

Card 2/2 mlp

MASLOV, V.S.

Development of production and use of new equipment at the "Belka" Factory. Kozh.-obuv. prom. no.3:31-32 Mr '59.
(MIRA 12:6)

(Fur)

MASLOV, V.S.; GORYACHEV, A.G.; SUVOROV, V.N.

Device for cutting irregularly shaped windshields. Stek.i ker. 17 no.4:37-38 Ap '60. (MIRA 13:8)
(Glass cutting)
(Automobiles—Windows and windshields)

NETREBKO, P.G., inzh.; RABINOVICH, G.B., inzh.; SUKONNIK, M.A., inzh.; MASLOV, V.S., inzh.; LISHIN, I.I., inzh.

Experimental use of conveyor feeding of the charge mixture to powerful blast furnaces. Stal' 23 no.5:397-400 My '63. (MIRA 16:5)

(Blast furnaces) (Conveying machinery)

MASLOV, V. V.

Maslov, V. V. — "Investigationof the Process of Combustion in a High-speed Ship Stoker." Min River Fleet USSR, Leningrad Inst of Engineers of Water Transport, Leningrad, 1955 (Dissertation for the Degree of Candidate in Technical Sciences)

SO: Knizhnaya Letopis', No 24, 11 June 1955, Moscow, Pages 91-104

SOV/124-58-7-7562

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 7, p 34 (USSR)

AUTHOR: Maslov, V.V.

TITLE: Results of Tests of a High-heat-release Anthracite Combustion Chamber and Prospects of its Use on River Vessels (Rezul'taty ispytaniy topki skorostnogo goreniya dlya antratsita i perspektivy yeye vnedreniya na rechnom flote)

PERIODICAL: Tr. Tsentr. n.-i. in-ta rechn. flota, 1957, Nr 35, pp 63-89

ABSTRACT: The theoretical analysis given in the article and the results obtained from an experimental investigation of the high-heat-release process of anthracite combustion occurring inside the fire chamber confirm the correctness of its basic design principles. The process is shown to depend on maintaining an even permeability of the bed of the high-heat-release fire chamber relative to the air---which can be done by scattering the fuel over the bed with the aid of a rotary stoker. This chamber, of the high-thermal-stress type, burns anthracite efficiently and is equal to the demands made on modern power units.

Card 1/1 1. Combustion chambers--Design 2. Coal --Combustion 3. Combustion--Theory R.P. Vorontsov

MASLOV, V.

Under operational conditions. Mor. flot 18 no.12:19 D '58.
(MIRA 12:1)

1.Zamestitel' nauchal'nika sluzhby sudovogo khozyaystva "Kaspnefteflota" Ministerstva neftyanoy promyshlennosti AzerSSR.
(Marine diesel engines)

MASLOV, V.V., kand. tekhn. nauk

Use on ships of the mechanical atomizing system in the burning of highly viscous M80-100 mazuts. Inform. sbor. TSNIIMG no.44 Tekh. ekspl. mor. flota no.2:55-65 '59. (MIRA 16:10)

MASLOV, V.

Employment of internal combustion engine with reduced clearance in the crank bearings. Mor.flot 19 no.9:32-33 S '59. (MIRA 12:11)

1. Zamestitel' nachal'nika sluzhby sudovogo khozyaystva upravleniya "Kaspnefteflot."

(Marine diesel engines)

GOL'DENFON, Aleksandr Kel'manovich; BABADZHANYAN, Levon Arakelovich; MASLOV, V.V., kand. tekhn. nauk, retsenzent; GERLOVIN, L.I., inzh., retsenzent; KITVID, L.V., nauchnyy red.; OZEROVA, Z.V., red.; TSAL, R.K., tekhn. red.

[Performance and operation of marine boilers]Rabochie protsessy i ekspluatatsiia sudovykh kotlov. Leningrad, Sudpromgiz, 1962. 423 p. (MIRA 15:11)

(Boilers, Marine)

MASLOV, V.V., kand.tekhn.nauk

Analysis of the present state and prospects for the development of marine engine auxiliaries. Inform. sbor. TSNIIMF no.73. Tekh. ekspl. mor. flota no.13:18-40 '62. (MIRA 16:3)
(Marine engineering)

MASLOV, V.V., kand. tekhn. nauk

Certain aspects of outfitting the power plant of the motorship "Poltava" with auxiliary equipment. Inform. sbor TSNIIMF no.96. Tekh. ekspl. mor. flota no.23:40-56 '63 (MIRA 18:1)

ACC NR: AR6028516 (N) SOURCE CODE: UR/0398/66/000/005/V016/V016

AUTHOR: Maslov, V. V.

TITLE: Compressed air systems for ships with slow speed engines and fitting them out with auxiliary equipment

SOURCE: Ref. zh. Vodnyy transport, Abs. 5V72

REF SOURCE: Inform. sb. Tsentr. n.-i. in-t morsk. flota, vyp. 40 (139), 1965, 3-23

TOPIC TAGS: marine equipment, engine compressor system, high pressure compressor, compressor design, cargo ship, ship component, diesel engine, marine engine, engine auxiliary equipment

ABSTRACT: The main compressed air installations in motorships of the Beloretsk, Poltava and Volgoles types are described. The differences in the requirements imposed on compressed air systems by the rules of classification societies are reviewed. The compressed air systems installed in ships built in recent years both in the Soviet Union and abroad are analyzed and a table listing the units contained in the systems is presented. Suggestions for rational outfitting of a compressed air system are made. A proposed arrangement envisages the installation of a main booster compressor, which will make possible doing away with two compressors, the cylinder for typhoons, the cylinder for domestic needs, and a reduction in the number of

Card 1/2

UDC: 696.5

ACC NR: AR6028516

cylinders for the diesel generators. The installation also proposes doing away with the cooling pumps attached to the compressor. 8 figures, 5 tables. [Translation of abstract]

SUB CODE: 13

Card 2/2

MASLOV V. V.

USSR

537.226.2 : 548.736.3

7011. Dielectric characteristics and structure of polycrystals of the system $ZnO.TiO_2$–$1{\cdot}5MgO.TiO_2$. G. I. SKANAVI AND V. V. MASLOV. *Zh. Eksper. Teor. Fiz.*, 27, No. 6(12) 735–41 (1954) In Russian.

The experimental findings show that the dielectric constant of the system $ZnO.TiO_2$–$1{\cdot}5MgO.TiO_2$ in a wide range of concentrations remains practically constant when the second component is partly replaced by the first (70–75% by weight of $ZnTiO_3$). This may be explained by the fact that the electronic polarizability of the Zn and Mg ions is equal and that the radii of the Zn^{2+} and Mg^{2+} ions are also nearly equal. The crystal lattice has thus always roughly the same structure, as is confirmed by X-ray investigations. The temperature coefficient of the dielectric constant increases slightly with $ZnTiO_3$ concentration. The differences in the dielectric characteristics between mixed titanates of the spinel and perovskite types are discussed with reference to their differing structures which permit of a perfect interpretation of the empirical data.

H. F. KRAUS

61

1

Physics Institute P.N. Lebedev, AS USSR

SOV/110-59-9-19/22

AUTHORS: Bayev, V.A., Maslov, V.V. and Orzhakhovskiy, M.L. (all Engineers)

TITLE: The Principles of Humidity Test Conditions on Products Intended for Tropical Service

PERIODICAL: Vestnik elektropromyshlennosti,1959,Nr 9,pp 72-77 (USSR)

ABSTRACT: A great many different recommendations are made about humidity testing of products for tropical service. It is desirable to compare the different methods, to see how products may be most realistically evaluated. Tests should be of short duration but should not damage the product. Electrical qualities may be assessed by measurements of the insulation resistance or the capacitance of the insulation before and after testing. Both types of measurement were made in the present work. The ratio of the capacitance at a frequency of 2 c/s to that at a frequency of 50 c/s was also measured. The recommended procedure is to measure the capacitance of the insulation during the process of humidification and to determine the relative increase in permittivity of the insulation. Graphs are then constructed of the increase in permittivity as a function of humidification time and

Card 1/6

The Principles of Humidity Test Conditions on Products Intended for Tropical Service

the graphs for machines of normal and tropical design are compared. The humidity testing recommendations of the International Electrotechnical Commission (IEC) are discussed and it is considered that they are of limited value and applicable only to a narrow range of radio components. Accordingly, the objects of the present work were: to determine the best duration of test; to determine the best temperature and duration of accelerated test conditions; and to determine the best cycle of temperature and humidity testing. The tests were made on induction motors types A06 of 10 kW and A04 of 2.8 kW of both normal and tropical constructions. The tropical 10 kW motors had silicone insulation and the normal motors class B insulation. The tropical 2.8 kW motors used glass cloth and flexible micanite as slot insulation, whilst cotton and pressboard were used in the normal motors. Tests were also made on other types of equipment, such as contactors. The humidity and temperature chamber is described. Electrical equipment in the chamber was exposed to a relative humidity of 98-100% at temperatures of 20, 40, 55 and 70 °C for 10-30 days.

The Principles of Humidity Test Conditions on Products Intended for Tropical Service

Moreover, at 40 and 55 °C the equipment was exposed to humidity cycles for 10-20 days. Each cycle lasted 24 hours and consisted of 6 or 18 hours at 98-100% humidity at the test temperature with subsequent cooling for 18 or 6 hours. These cycles were called 6 - 18 and 18 - 6 respectively. Similar equipment was also exposed under natural conditions at Shanghai in the wet season. The climatic conditions are described. Graphs of changes in permittivity against time during tests in the tropical testing chamber at various temperatures are given in Figs 1 to 3. It will be seen that humidity testing for 13 days at 40 °C does not differentiate between tropical and normal insulation. However, at 55 °C there is an appreciable difference from the fifth day onwards. The difference is revealed even more quickly at 70 °C but at that temperature even the tropical insulation deteriorates so quickly that the difference diminishes again. It appears, therefore, best to make the test at 55 °C for seven days. The temperature at which the equipment is maintained at 98-100% relative humidity affects the rate

of change of electrical characteristics and is of considerable interest. Figs 4 and 5 show graphs of the increase in permittivity as function of time on continuous exposure to humidity at various temperatures. The curves in Fig 6 show the degree of acceleration of the tests made at high temperature as compared with those made at 20 °C. At 70 °C acceleration is by a factor of about 30, at 55 °C by a factor of 10, and at 40 °C by a factor of 2.5-3. It is accordingly recommended that the best test duration at 40 °C is 21-28 days, assuming that the best test time at 55 °C is 7 days. Continuous and cycled humidity tests are then compared. It will be seen from the curves given in Figs 7 and 8 that the conditions of 18 hours humidity followed by 6 hours cooling are the most severe. The recommendation that the humidity tests should be cyclic and not continuous is confirmed by the attitude of the Indian Delegation to the Stockholm Session of the I.E.C. in 1958 and by other published work. In addition to test-chamber results the curves of Figs 4 and 5 show also changes in permittivity during exposure under natural conditions in Shanghai. It is concluded that,

The Principles of Humidity Test Conditions on Products Intended for Tropical Service

approximately, a tropical chamber test of 21 days at 40°C with the 16 - 8 cycle is 20-25 times more severe than natural exposure. Thus the chamber test of 21 days is approximately equivalent to 1-1½ years' natural tropical exposure. The factors that influence the rate of humidification of insulation are briefly discussed. The tests may be made at constant relative humidity but different temperatures. In this connection curve 1 of Fig 6 indicates that as the temperature is raised the rate of humidification increases more rapidly than does the total humidity present. Tests may also be made at different total humidity at various temperatures, and in this case the lower the temperature the higher the relative humidity. Also, humidification is then more rapid at the lower temperature. This was confirmed by tests on stators of normal and tropical construction; test results are plotted on Figs 9 and 10, to show change of

The Principles of Humidity Test Conditions on Products Intended for Tropical Service

permittivity as a function of exposure time at given absolute but variable relative humidity.
There are 10 figures and 3 Soviet references.

BAYEV, V.A., inzh.; MASLOV, V.V., inzh.; ORZHAKHOVSKIY, M.L., inzh.

Performance of electrical equipment designed for operation in tropical climates. Vest. elektroprom. 33 no.7:30-35 Jl '62. (MIRA 15:11)

(Electric apparatus and appliances)

BAYEV, V.A., inzh.; MASLOV, V.V., inzh.

Polymer synthetic materials should be used on a wider scale. Vest. elektroprom. 34 no.5:1-3 My '63. (MIRA 16:5)
(Polymers)

MASLOV, V.V.; [illegible], M.I., [illegible], Ye.I., red.

[Manufacture of machinery industry equipment for countries with tropical climates] Izgotovlenie mashinostroitel'nogo oborudovaniia dlia stran s tropicheskim klimatom. Moskva, Mashinostroenie, 1964. 270 p.
(MIRA 18:)

MASLOV, V. YA. (Senior researcher)

"Philosophy as a Sphere of Action of Ideology on the Development of Natural Sciences."

report presented at the 13th Scientific Technical Conference of the Kuybyshev Aviation Institute, March 1959.

MASLOV, V. YA.

The Committee on Stalin Prizes (of the Council of Ministers USSR) in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1952 and 1953. (Sovetskaya Kultura, Moscow, No. 22-40, 20 Feb - 3 Ap. 1954)

Name	Title of Work	Nominated by
Petrosyan, A. A. Maslov, V. Ya.	"Local Types of Fruit Crops of Moldavia"	Institute of Fruit Growing, Viticulture and Viniculture of the Moldavian Affiliate Academy of Sciences USSR

SO: W-30604, 7 July 1954

MASLOV, Vasiliy Yakovlevich; SMYKOV, Vladimir Karpovich; KHRAMOV, Yevgeniy Sergeyevich; FITOVA, L., red.; KURMAYEVA, T., tekhn.red.

[Best stone fruit varieties for Moldavia] Luchshie sorta kostochkovykh porod dlia Moldavii. Kishinev, Gos.izd-vo "Kartia moldoveniaske," 1961. 62 p. (MIRA 14:6)
(Moldavia--Stone fruit--Varieties)

SOV/96-58-6-13/24

AUTHORS: Maslov, V.Ye., Engineer and Marshak, Yu.L., Cand.Tech.Sci.

TITLE: An investigation of the separation of solid suspended particles on to a liquid film with a swirling gas flow. (Issledovaniye separatsii tverdykh vzveshennykh chastits na plenku zhidkosti pri vikhrevom dvizhenii potoka).

PERIODICAL: Teploenergetika, 1958, vol 5, No.6. pp. 63 - 70. (USSR)

ABSTRACT: It is difficult to study the way that slag is separated and trapped in cyclone furnaces under normal operating conditions. Accordingly, it is of interest to study cold models in which the liquid slag surface is represented by a film of viscous liquid and the drops of liquid slag by solid particles in suspension. Tests in the cold are, however, not entirely representative because of the effects of combustion on the aerodynamics of the process. This work attempts a more careful study of the separation of suspended particles from a swirling flow on to a film of viscous liquid, applying the theory of similarity. The equipment used in the experiments was a horizontal section of tube, fitted with various measuring instruments and attached to the discharge side of a fan. The various separator models shown in fig.1. were connected to the open end of the tube. The inside of the models was lined with cloth coated with vaseline. The dusty-particles, obtained by winnowing, were fed into the inlet tube at a suitable distance from

Card 1/5

An investigation of the separation of solid suspended particles on to a liquid film with a swirling gas flow.

the inlet to the model. The dust consisted of crystals of $K_2Cr_2O_7$ with a specific gravity of 2.69×10^3 kg/m^3. There is not complete agreement about the criteria that govern the separation of dut in cyclones. Some consider that when the resistance of the particles follows Strokes' law, the governing criteria are those of Stokes and Froude; others consider that the process of separation is governed only by the Stokes criterion. A special study of this point was accordingly made. A number of effects that occur in dry cyclones were absent, because once a particle of dust touched the sticky wall it was trapped. The tests were made on geometrically similar models installed vertically with tangential flow inlet as shown in fig.1. The diameter of the models ranged from 50 to 400 mm, and the length was four diameters. Separation was improved by increasing the size of particles and the rate of flow, and by decreasing the diameter of the model. The results are plotted as functions of Stokes' criterion in fig.2., and it is shown that this criterion is the governing one.

Card 2/5

An investigation of the separation of solid suspended particles on to a liquid film with a swirling gas flow.

Change in Froude's criterion over very wide limits has no influence on the process of separation. A plot of the change in the coefficient of dust distribution along the length of the chamber with tangential inlet is given in fig.3. Most of the dust is deposited in the first section of the chamber, and the character of the curves alters very little with changes in the Stokes' criterion. In an actual cyclone, combustion reduces the swirling of the flow. To study the effect of changes in swirl upon dust separation, tests were made in a cylindrical chamber 100 mm diameter and 400 mm long, with various swirlers having blades set at different angles. The resultant relationship between the degree of separation and Stokes' criterion is plotted in fig.4. The change in degree of separation along the length of the chambers with bladed swirlers is plotted in fig.5, which shows that if the swirl of the flow is increased more dust is deposited in the early stages. It follows that to get good separation in short chambers, good swirling is required, and that if the chamber is long the reduction in swirl that results from combustion will be less damaging than if the chamber is short. To study the influence of the shape of the chamber, tests were made with cylindrical chambers having various ratios of chamber to swirler diameter, and on square and rectangular chambers. The same swirler

was used in all tests. The results are plotted in figs. 4 and 5. The transition from round to square to rectangular shape reduces the separation of dust, the effect being most marked in long chambers. Reduction in the diameter of the swirler relative to that of the separator reduced the separation, particularly in long chambers. Analysis of the experimental data yields a generalised relationship that may be used to determine the degree of separation of dust in variously-proportioned chambers with bladed swirlers with various amounts of swirl. Tests were made on a 1/5 - scale model geometrically similar to a cyclone pre-furnace of the All Union Thermotechnical Institute. The three burner arrangements depicted in fig.7. were used. The graphs in fig.8. show the relationship between the total degree of separation and the flow of air in the chamber. Dust is trapped best when all the air is passed through the bladed burner, and worst when 80% of the air passed through the tangential nozzle and the rest through the bladed burner. Thus, it may be supposed that with an equipment of given resistance to flow, the best burner arrangement, when the fuel is

An investigation of the separation of solid suspended particles on to a liquid film with a swirling gas flow. SOV/96-58-6-13/24

of high volatiles content, is one in which all the fuel dust and air are passed through the bladed burner. When the fuel is of low volatiles content, ash is best removed by a construction in which only the fuel/air suspension is passed through the bladed burner and the rest is passed through the tangential nozzle. This improves the combustion conditions by increasing the time that the fuel particles are in the pre-furnace before reaching the walls. There are 8 figures and 15 literature references (11 Soviet, 2 German and 2 English)

ASSOCIATION: All Union Thermotechnical Institute. (Vsesoyuznyy Teplotekhnicheskiy Institut)

1. Slags--Separation 2. Gas flow--Applications

Card 5/5

MASLOV, V. Ye., Candidate Tech Sci (diss) -- "Investigation of the mechanism of separation of solid suspended particles from an isothermic cyclone stream on a sheet of viscous liquid". Moscow, 1959. 15 pp (Min Construction of Electric Power Stations USSR, All-Union Order of Labor Red Banner Heat-Engineering Sci Res Inst im F. E. Dzerzhinskiy), 135 copies (KL, No 24, 1959, 138)

SOV/96-59-12-10/20

AUTHORS: Marshak, Yu. L., Candidate of Technical Sciences, and Maslov, V. Ye., Engineer

TITLE: The Arresting of Suspended Particles Flowing Isothermally Through a Bundle of Tubes Coated with Viscous Fluid

PERIODICAL: Teploenergetika, 1959, Nr 12, pp 55-62 (USSR)

ABSTRACT: Published data on the separation of suspended particles in a flow of gas by a bundle of tubes are not very suitable for design purposes. Tests were accordingly made to study the influence of tube bundle geometry, rate of gas flow, particle size distribution and other factors on the process of ash-arresting. The tests were made in a vertical duct of 100 x 100 mm containing model tube bundles and connected to an extraction fan. The tubes were smeared with petrolatum to represent molten slag. The dust used was potassium bichromate, and the quantity trapped was determined by iodometric methods of analysis. The various models of bundles of tubes that were tested are shown in Fig 1. In the main test the tubes were 5 mm diameter, which is about 1/20th of the diameter used in practice. The efficiency of arresting was evaluated by Eq (2) which is in terms of

Card 1/6

The Arresting of Suspended Particles Flowing Isothermally Through a Bundle of Tubes Coated with Viscous Fluid

the ratio of the quantity of material trapped to the average content of the material in the flow at inlet to the bundle. The tests made with different constructions of tube bundles were carried out with dust of 12 to 18 microns at a rate of flow of 16 m/sec. The distribution of the effectiveness of dust-arresting by tubes in different rows is plotted in Fig 2. The second row of tubes was always the most effective because of the local increase in the particle content of the flow immediately ahead of them. The increase was due to the passage of the flow over the first row. In general, the second, third and presumably successive rows are approximately as effective as the first one. In order to determine the influence of the main physical factors on the process of dust separation, tests were made with the first model. It had three bundles, each comprising four rows of tubes; the rates of flow ranged from 2 to 30 metres per second, with particle sizes ranging from 0 - 12 to 75 - 90 microns, and tube diameters of 5 and 10 mm. Test results obtained at various rates

The Arresting of Suspended Particles Flowing Isothermally Through a Bundle of Tubes Coated with Viscous Fluid

of flow are plotted in Fig 3. It will be seen that within the range of 8 to 30 m/sec there is very little increase in the efficiency of separation of dust by the first two rows, but a somewhat greater improvement in the third and fourth rows. The influence of dust particle size on the effectiveness of separation at various rates of flow is plotted in Fig 4. The curves show that larger particles promote separation, particularly by tubes in the first two rows. The relative effectiveness of successive rows with different particle sizes is discussed. Doubling the diameter of the tube was found to slightly decrease the amount trapped by the tubes of the first and second rows. The resistance of the bundles of tubes related to the rate of flow in the narrow section between tubes for various values of Reynolds number, number of rows and pitch of tube, are plotted in Fig 5. The relationship between the resistance and Reynolds number is not clearly expressed. The factors governing the resistance are discussed. It is

The Arresting of Suspended Particles Flowing Isothermally Through a Bundle of Tubes Coated with Viscous Fluid

usually considered that the Stokes' number alone determines the process of separation when a dusty flow passes over a cylinder. It is here shown that the Froude number also has an effect, particularly for the first two rows. Fig 6 indicates that all the experimental points can be plotted on a single curve if the efficiency of arresting is plotted as function of a complex that includes the Stokes, Froude and Reynolds numbers in the correct proportions. It will be seen from Fig 7 that the process of separation on the third and fourth rows can be described with sufficient accuracy by the Stokes' number. Fig 8 shows curves of the efficiency of arresting for various rates of flow. This graph may be used to make calculations on slag-arresting by tube bundles with a square arrangement; there can be any number of rows of tubes, their spacing across the flow being 2 - 4 diameters, and in line with the flow 2 - 3 diameters. The efficiency of arresting is given by expression (5), for particles of a particular size; when the flow

Card 4/6 contains a wide range of particle sizes, expression (7)

The Arresting of Suspended Particles Flowing Isothermally Through a Bundle of Tubes Coated with Viscous Fluid

should be used. Ash-removal factors for various two- and four-row arrangements of tube bundles are plotted in Fig 9 as functions of gas speed and tube arrangement. This graph also can be used for practical calculations. The ash-removal by various tube arrangements was calculated for a flow of air containing dust of the particle size distribution found at the inlet to the induced-draught fan of a power station burning Zakamsk coal. In this case there is no evident advantage to be gained by leaving a clear space between successive bundles of tubes. It is concluded that twin tubes should not be used in this type of ash arrester. In general, these ash arresters can be very effective in a cyclone furnace, and cause only a small increase in the head of draught. In particular, if four bundles, each comprising two rows, are fitted beyond the cyclone chamber the ash-removal factor can be increased from 80 to 88.5%, or from 85 to 91.4% with a draught increase of approximately 45 mm of

Card 5/6

The Arresting of Suspended Particles Flowing Isothermally Through a Bundle of Tubes Coated with Viscous Fluid

water. Still better results are obtained when the ash is coarse and there is less separation in the chamber. There are 9 figures, 1 table and 11 references, 8 of which are Soviet and 3 English.

ASSOCIATION: VTI - Vostochnyy filial VTI (All-Union Thermo-Technical Institute. Eastern Branch All-Union Thermo-Technical Institute)

Card 6/6

28(5) 05757

AUTHORS: Maslov, V. Ye., Marshak, Yu. L. SOV/32-25-10-46/63

TITLE: On the Initial Quantity of Dust in Working With Models of Dust Collectors

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 10, pp 1258-1259 (USSR)

ABSTRACT: For the purpose of investigating a separation of aerosols in models of various dust-collecting devices a simple and reliable method was worked out, in which the dust-collecting surface is coated with a viscous liquid (e.g. vaseline). The quantity of dust deposited on this surface may be determined according to various physico-chemical methods (Ref 1). As the minimum size of the dust particles absorbed by a device is determined by the dimension of the latter, experiments must be carried out with the finest particles in order to attain greater efficiency of the device. Several experiments (Ref 2) showed that greater quantities of fine dust may be absorbed on a viscous surface than was stated in a paper by N. F. Dergachev (Ref 1). In order to solve this problem experiments were carried out with a model with a tube having a diameter of 50 mm and a length of 200 mm with various

Card 1/2

05757

On the Initial Quantity of Dust in Working With Models of Dust Collectors SOV/32-25-10-46/63

quantities of a fine (0-12 μ) dust of $K_2Cr_2O_7$ at a tangential air flow velocity of 7 m per second. It was found that a variation of the quantities of dust from 9.6 to 205 mg (Fig, diagram) influences neither the total degree of separation nor the distribution of the deposited particles along the model. Thus, when working with fine dust (0-12 μ), the initial quantity may be much higher than previously stated. There are 1 figure and 3 Soviet references.

ASSOCIATION: Vsesoyuznyy teplotekhnicheskiy institut (All-Union Thermal Engineering Institut)

Card 2/2

MASLOV, V.Ye., kand.tekhn.nauk

Heat of combustion of the volatile matter of Kuznetsk Basin open pit mine coals and its effect on the mechanical underburning. Teploenergetika 9 no.5:20-22 My '62. (MIRA 15:4)

1. Vostochnyy filial Vsesoyuznogo teplotekhnicheskogo instituta.
(Kuznetsk Basin--Coal) (Combustion)

MASLOV, V.Ye., kand.tekhn.nauk; SAL'KOV, P.G., kand.tekhn.nauk; PROTSAYLO, M.Ya., inzh.; SMORGUNOV, M.P., inzh.; KROTOV, V.I., inzh.; OSTROMOV, A.M., inzh.; SHESTAKOV, V.M., inzh.

Experience in burning brown coals in wet-bottom furnaces with shaft-type impact mills. Teploenergetika 10 no.2:15-19 F '63. (MIRA 16:2)

1. Vostochnyy filial Vsesoyuznogo teplotekhnicheskogo instituta, Chelyabinsk, Krasnoyarskenergo i Vsesoyuznyy nauchno-issledovatel'skiy teplotekhnicheskiy institut.
(Boilers) (Furnaces) (Lignite)

MASLOV, V.Ye., kand. tekhn. nauk; PROTSAYLO, M.Ya., inzh.; OSTROUMOV, A.M., inzh.

Study of dust currents in the embrasure of a shaft mill operating on Kansk-Achinsk lignite. Teploenergetika 11 no.11:34-39 N '64. (MIRA 17:12)

1. Vostochnyy filial Vsesoyuznogo teplotekhnicheskogo instituta, Chelyabinsk, i Krasnoyarskaya TETs-1.

MASLOV, Ye., inzh.

How to plow under the stubble remnants of corn. Zemledelie 25 no. 10:77 O '63. (MIRA 16:11)

1. Korochanskoye ob"yedineniya "Sel'khoztekhnika", Belgorodskoy oblasti.

L 57117-65 EWT(1)/EWA(h) Peb

ACCESSION NR: AP5015496 UR/0286/65/000/008/0027/0028
521.3.072

AUTHOR: Klyuchantsev, S. V.; Maslov, Ye. A.

TITLE: A regulator for the collector current and for the voltage at the collector-emitter junction in a transistor. Class 21, No. 170087

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 8, 1965, 27-28

TOPIC TAGS: voltage regulator, junction transistor

ABSTRACT: This Author's Certificate introduces a regulator for the collector current and for the voltage at the collector-emitter junction in a transistor. The device is designed for use in industrial installations for measuring the parameters of transistors connected in a common emitter circuit. The unit contains a voltage

device is designed for use in industrial installations for measuring the [illegible] of transistors connected in a common emitter circuit. The unit contains a voltage regulator and an automatic control unit for the collector current. The device is designed for improved regulating accuracy. The automatic collector current regulator contains a pulse generator which is connected to two controlled rectifiers. These rectifiers are connected to the addition and subtraction inputs of an *n*-place reversible counter. The counter is connected through an analog converter and a

Card 1/3

L 51417-65
ACCESSION NR: AP5015496

power amplifier to the base of the transistor being tested. Two relay elements are connected in the collector circuit of the transistor which is fed from a voltage-regulated power supply. The outputs of the relay elements are connected to the control rectifier.

ASSOCIATION: none

SUBMITTED: 01Jul63 ENCL: 01 SUB CODE: EC

NO REF SOV: 000 OTHER: 000

Card 2/3

L 5717-65
ACCESSION NR: AP5015496

ENCLOSURE: 01

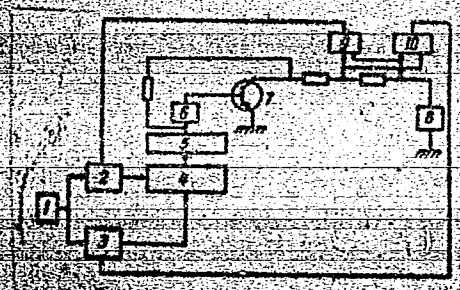


Fig. 1. 1--pulse generator; 2 and 3--controlled rectifiers; 4--reversible counter; 5--analog converter; 6--amplifier; 7--transistor being tested; 8--voltage-regulated power supply; 9 and 10--relay elements

Card 3/3

MASLOV Ye. F

137-58-1-18/33

AUTHOR: Esibyan, E.M., Engineer, and Maslov, Ye.F.

TITLE: A Clamping Device for the Welding Regulator (Fiksator k svarochnomu regulyatoru)

PERIODICAL: Svarochnoye Proizvodstvo, 1958, Nr 1, p 40 (USSR)

ABSTRACT: Regulators of welding devices for alternating current, type ASTE and STAN, often lose their core-screw during the working process. This fact explained by vibration, has a negative effect on the welding process, causing changes in the welding current. This deficiency was eliminated with the aid of a clamping device fixed on the regulator handle, fastening the handle in a desired position. At present nearly all welding regulators at the Baku plant imeni Oktyabr'skaya Revolyutsiya are equipped with clamping devices of this design. There is 1 figure.

ASSOCIATION: Bakinskiy zavod imeni Oktyabr'skoy revolyutsii (The Baku Plant imeni Oktyabr'skaya Revolyutsiya).

AVAILABLE: Library of Congress

Card 1/1 1. Welding-Regulators-Control

MASLOV, Ye. I., DOCENT DOC TECH SCI

Dissertation: "Fundamentals of the Grinding Theory of Metals."

25 May 49
Moscow Machine Tool Inst imeni I.V. Stalin.

SO Vecheryaya Moskva
Sum 71

SHVEDOV, V.P.; MASLOV, Ye.I.

Determination of the composition and stability constants of complex compounds by the electromigration method. Part 1: Determination of the compositions and stability constants of oxalate complexes of zirconium. Radiokhimia 4 no.4:427-434 '62. (MIRA 15:11)
(Zirconium compounds)
(Oxalates)

MASLOV, Ye. N., Docent

Candidate of Technical Sciences

Review of N. F. Baranets, Shlifoval'nyy krug i ego vybor (The Grinding Wheel and Its Selection), Moscow, 1943. Stanki I Instrument, 15, No. 6, 1944.

BR 52059019

MAS'OV, E. N.

Zuboreznoe delo. Moskva, Mashgiz, 1947. 370 p. illus.

(Gear-cutting.)

DLC: TJ187.M28

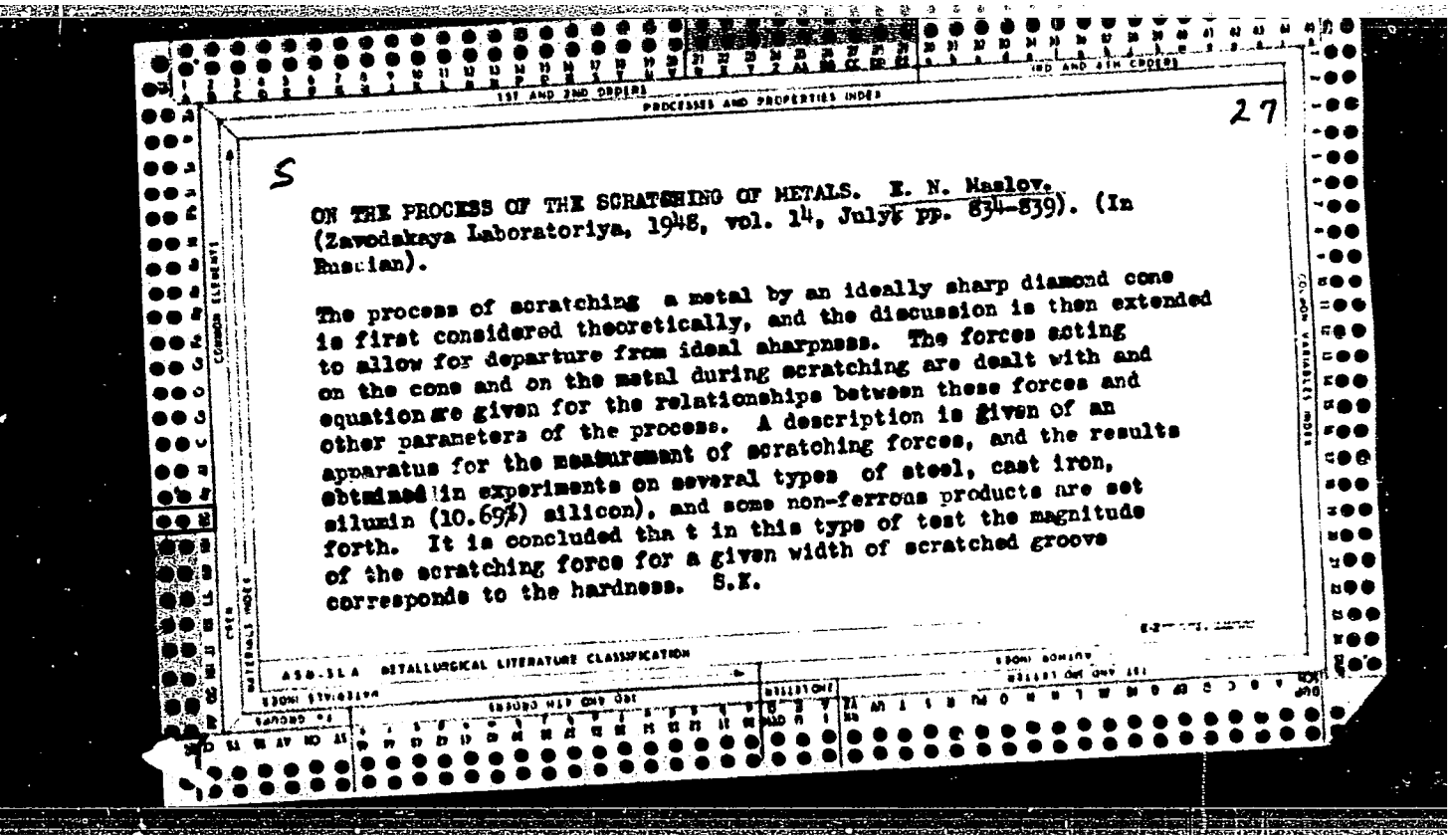
SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

1. MASLOV, E. N.

2. USSR (600)

7. Physical Nature of Specific Pressure of Cutting, Machine Tools and Instruments, No. 9, Sep 1948

9. Compilation of Information of the USSR Machine and Machine Tools Industry Contained in Soviet Publications. ATIC. Restricted.



PROCESSES AND PROPERTIES INDEX

27

S

ON THE PROCESS OF THE SCRATCHING OF METALS. E. N. Maslov. (Zavodskaya Laboratoriya, 1948, vol. 14, July, pp. 834-839). (In Russian).

The process of scratching a metal by an ideally sharp diamond cone is first considered theoretically, and the discussion is then extended to allow for departure from ideal sharpness. The forces acting on the cone and on the metal during scratching are dealt with and equations are given for the relationships between these forces and other parameters of the process. A description is given of an apparatus for the measurement of scratching forces, and the results obtained in experiments on several types of steel, cast iron, silumin (10.6%) silicon), and some non-ferrous products are set forth. It is concluded that in this type of test the magnitude of the scratching force for a given width of scratched groove corresponds to the hardness. S.K.

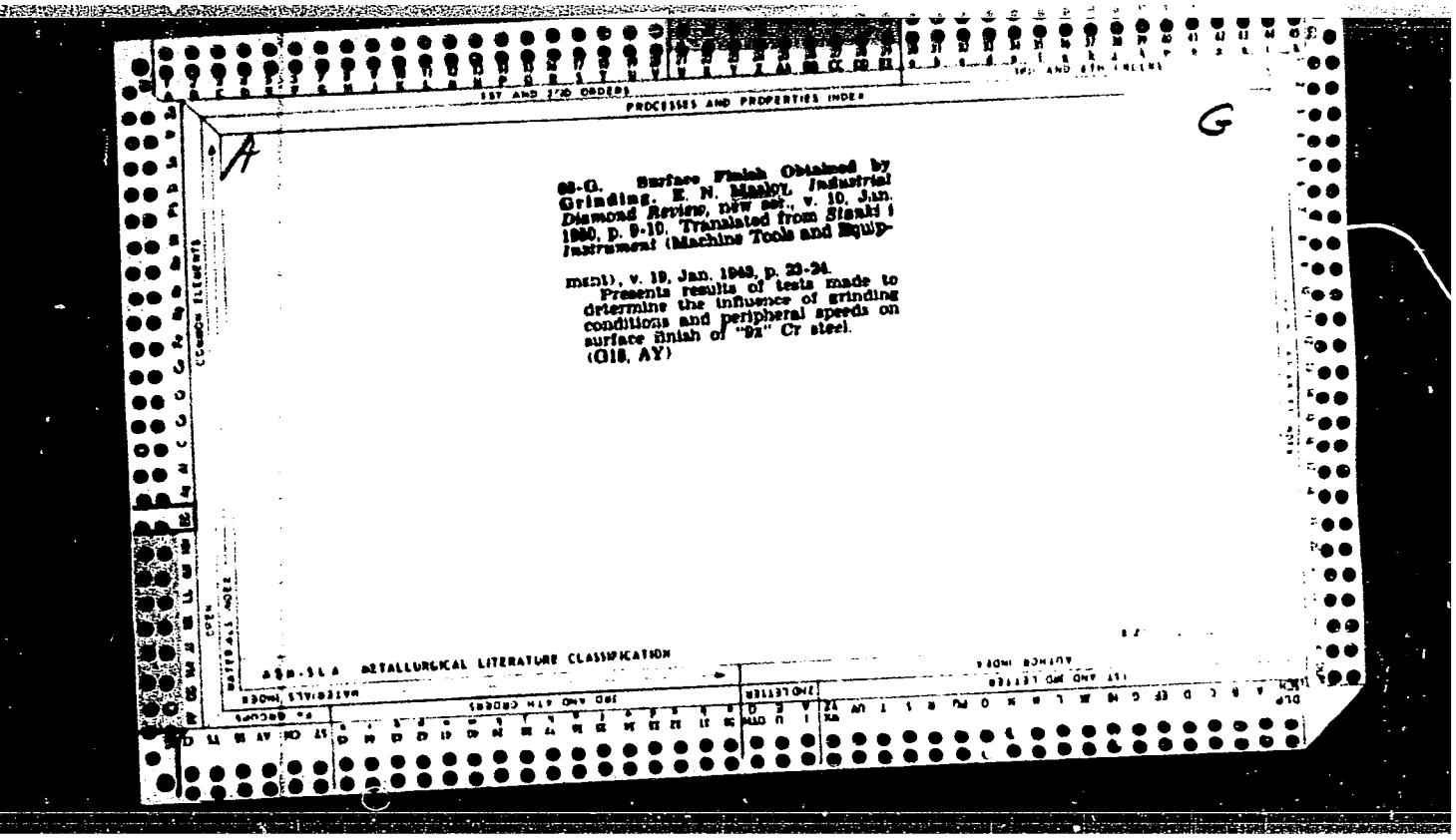
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

M

19

The Physical Nature of the Specific Pressure of Cutting. E. N. Maslov. (*Stanki i Instrument*, 1948, 19, (9), 12–15).—[In Russian]. The edge of a cutting tool always has a finite radius of curvature C. Therefore, for a thickness of chip a of the same order of magnitude as C, the real angle of attack δ is always greater than the nominal (for $a = 0$, $\delta = 180°$; for $a = C$, $\delta = 90°$; and for $a > C$, $\delta < 90°$). The specific pressure of cutting is therefore very considerably increased for thin chips, while for thick ones the influence on the total work of deformation is small. When $a < C$ the metal may be crushed and the cutting tool may slide off, causing vibrations or making cutting impossible. The blunting of cutting tools is an important factor, as the radius of curvature of the cutting edge increases rapidly (e.g. $C = 18\ \mu$ initially, 37 μ after 1 min., 80 μ after 10 min.).—T. O. L.

Dec. 1950



1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

A

G

68-G. Surface Finish Obtained by Grinding. E. N. Manlov. *Industrial Diamond Review*, new ser., v. 10, Jan. 1950, p. 9-10. Translated from *Stanki i Instrument* (Machine Tools and Equipment), v. 19, Jan. 1948, p. 23-24.

Presents results of tests made to determine the influence of grinding conditions and peripheral speeds on surface finish of "9x" Cr steel.

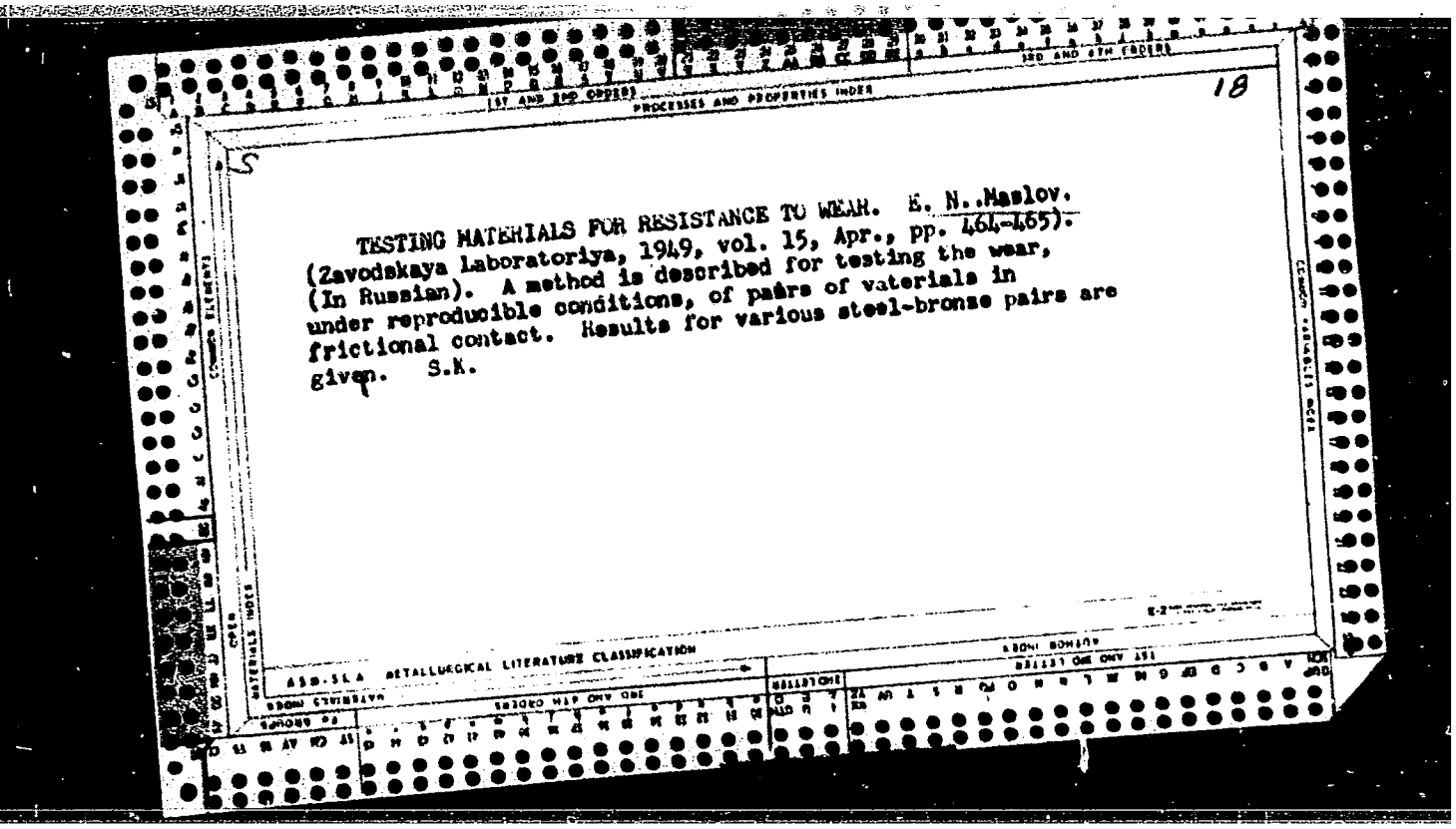
(G18, AY)

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

MASLOV, E. N.

No. 37348-- A. V. Gadolin--osnovopolozhnik teorii metallorezlusloliki stankov. (k 120-letiyu so dnya rozloeniya). Stanki i instrument, 1949, No. 12, s. 25-26, s portr.

So: Letopis' Zhurnal'nykk Statey, Vol. 7, 1949



TESTING MATERIALS FOR RESISTANCE TO WEAR. E. N. Maslov. (Zavodskaya Laboratoriya, 1949, vol. 15, Apr., pp. 464-465). (In Russian). A method is described for testing the wear, under reproducible conditions, of pairs of materials in frictional contact. Results for various steel-bronze pairs are given. S.K.

MASLOV, E.N.

Russkie uchenye-osnovopolozhniki i sozdateli nauki o rezanii metallov.

(Vestn. Mash., 1950, no. 5, p. 53-58; no. 6,p. 62-66; no. 8, p. 63068; no. 11, p. 63-71; 1951 no. 2, p. 69-78.)
Includes bibliographies.

Russian men of science founders and originators of metal-cutting studies.

DLC: TN4.V4

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

MASLOV, Ye. N. PA 164T71

USSR/Physics - Friction Jul 50

"Coefficient of Friction in Sliding and Scratching of Metals," Ye. N. Maslov

"Zhur Tekh Fiz" Vol XX, No 7, pp 888-891

Studies mu (0.1 to 0.22) vs P (normal force, 10 to 100 kg) for various metals: 80% Pb, 20% Sn, silumin, Cu, cast iron, bronze, etc. Also studies critical normal pressure (0 - 3,800 kg/sq mm) vs mu for same metals. Submitted 18 Mar 49.

164T71

MASLOV, E. N.

Osnovy teorii shlifovaniia metallov. Moskva, Mashgiz, 1951. p.(3) p. illus. Bibliography: p. 176-(178)

Fundamentals of the theory of metal grinding and polishing.

DLC: TJ1280.M3

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

MASLOV, E. N.

Vliianie temperaturno-skorostnogo faktora na protsess tonkogo resaniia metallov. (Vestn. Mash., 1951, no. 6, p.37-38)

Influence of the temperature and high speed factors upon thin cutting of metals..

DLC: TN4.V4

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953

MASLOV, E. N., PROF., IGNATOV, B. A. , ENG.

GRINDING AND POLISHING

Dependence of the smoothness of polished surface on the setting of polishing wheels. Vest. mash. 32 No. 5, 1952.

Monthly List of Russian Accessions. Library of Congress, October 1951. UNCLASSIFIED.