

GORSKIN, Jevgenijs; ~~CHERKOVSKIS, P.~~[translators]; DIMDINS, J.
[translators]; ROZKALNE, V.[translator]; LIELPETERIS, P.,
red.; PASTARE, D., tekhn. red.

[Problems in the specialization of livestock raising in the
Latvian S.S.R.] Latvijas PSR lopkopibas specializācijas
problemas. Riga, Latvijas Valsts izdevniecība, 1961. 106 p.
Translated from the Russian. (MIRA 15:3)
(Latvia--Stock and stockbreeding)

FEDOROV, N.N., kand.tekhn.nauk; POPOV, I.V., kand.geogr.nauk; BORSUK, O.N.,
kand.geogr.nauk; GRUSHEVSKIY, M.S., kand.tekhn.nauk; VELIKANOV,
M.A., prof., doktor tekhn.nauk, red.(Moskva); URYVAYEV, V.A., otv.
red.; ALEKIN, O.A., red.; BLIZNYAK, Ye.V., red. [deceased];
BORSUK, O.N., red.; DAVYDOV, L.K., red.; DOMANITSKIY, A.P., red.;
KALININ, G.P., red.; KRITSKIY, S.N., red.; KUDELIN, B.I., red.;
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M.K., red.; VLADIMIROV, O.G., tekhn.red.

[Transactions of the Third All-Union Hydrological Congress] Trudy
III Vsesoiuznogo gidrologicheskogo s"ezda. Vol.5. [Section of
Hydrodynamics and River-Bed Evolution] Sektsia gidrodinamiki i
ruslovykh protsessov. 1960. 421 p.

(MIRA 13:11)

1. Vsesoyuznyy gidrologicheskii s"ezd. 3d, Leningrad, 1957.
2. Gosudarstvennyy gidrologicheskii institut (for Fedorov, Popov).
3. Chlen-korrespondent AN SSSR (for Velikanov).

(Hydrology--Congresses)

CHERNOMYR'YANOV, A.Ye. *Abstract*

Estimation of the accuracy of a chain of triangles between starting points in triangulation of mixed order areas adjustment by grid elements for coordinate conditions. 20. 1976. *ucheb. zaves. geod. i aerof. snitk. spets. ts. (MIRA 17s)*

1. Novosibirskiy institut inzh. i geod. i aerof. ts. (Sib. ts. ts. i kartografii).

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AUTHOR: Cherkoz'yanov, A. T. (Aspirant)

ORG: Institute of Engineers of Geodesy, Aerophotosurveying, and Cartography,
Novosibirsk (Novosibirskiy institut inzhenerov geodezii, aerofotosyemki, i kartografi)

TITLE: Evaluation of the accuracy in a triangulation net with measured sides and
intermediate angles run between fixed points

SOURCE: IVUZ. Geodeziya i aerofotos'yemka, no. 2, 1966, 81-94

TOPIC TAGS: adjacent isosceles triangle, bearing angle, weighed function, condition
equation, mean quadratic error, *triangulation, triangle geometry*

ABSTRACT: Errors in direct measurements of connecting elements in a system of adjacent
isosceles triangles are evaluated. Results of measurements yield a system of N side
equations, bearing angles, and coordinates. Formulas are developed for bearing-
angle increases and the shift of the link at point K . When the numbers of sides
and the shift points are odd, the system of equations is given in the form of
weighed functions, and the system of conditional equations is divided into two groups.
The first group contains conditions of sides and the second group conditions of
bearing angles and coordinates. Special formulas are developed for coefficients in
conditional equations of the second group and for weighed functions. The manner of
solution of the conditional equations is explained, and the system of transformed

Card 1/2

ACC NR: AP6031605

equations is given. Formulas for determining mean quadratic errors for the bearing angle and longitudinal and transverse shifts are given. The mean quadratic error of bearing angles changes with the change of angles. A table in the original article contains numerical values of mean quadratic errors at various angles of triangles. A formula is developed showing the mean quadratic error in the function which appears as a result of errors in the initial data of bearing angles and the length of the base line of the triangulation net. This formula is adapted to any side of the bearing angle and any shift point in the net. Orig. art. has: 5 figures, 3 tables, and 27 formulas.

SUB CODE: 08/3/SUBM DATE: 23Dec65/ ORIG REF: 004

CHERKSEOVA, S.V.

Nature of variability in *Liorhynchus biplicatus* Nelivkin.
Trudy NIIGA 111:42-51 '60. (MIRA 14:7)
(Brachiopoda, Fossil)

CHERKUN, V.Yu., inzh.-mekhanik

How to check lubricating system valves in operating engines.
Mekh. sil'. hosp. 9 no.10:7-8 0 '58. (MIRA 11:10)
(Lubrication and lubricants)

CHERKUNOV, V.

~~Binoculars as teleobjective.~~ Sov. foto 18 no.9:42-44 S '58.
(Cameras) (Field glasses) (MIRA 11:10)

CHERKUDINOV, S. A.

Cherkudinov, S. A. On the general theory of geometric loci in metric synthesis.

Akad. Nauk SSSR, Trudy Sem. Teorii Mašin i Mehanizmov 1, 181-216 (1947). (Russian)
The main achievement of the paper is a simple solution of the problem: Determine the four-bar linkages $ABCD$ (AD fixed) for which the ratio of angular velocities of AB and DC has given values at two positions, B_1C_1 and B_2C_2 , given by the magnitudes of the angles $B_1AB_2 = \beta$ and $C_1DC_2 = \gamma$. The loci of all B_1 and C_1 are described in terms of "graphical elimination": each position of B_1 is determined as an intersection of two circles defined by A, D, β, γ and another parameter. The solutions of the corresponding problems for three and four given positions of BC are easily derived. This study completes (and apparently supersedes) an investigation started by H. Ahl [Z. Angew. Math. Mech. 1, 373-398 (1921)].

The title applies only to the remaining 72 per cent of the paper, a collection of abstract remarks about geometric loci, couched in logically questionable symbols. These remarks are exemplified in terms of "centers" of sets of corresponding points for n ($n=2, 3, 4$) positions of a rigid plane. Loci of such centers are the basic tools of the author's technique in "metric synthesis" (= kinematic design).

A. W. Wandheller (Chicago, Ill.)

SAW *221*

Source: Mathematical Reviews

CHERKUDINOV, S. A.

Cerkudinov, S. A. On the dead points of a driven member.

Akad. Nauk SSSR, Trudy Sem. Teorii Mašin i Mehanizmov 2, 143-149 (1947). (Russian)

Two mechanism design problems are solved by the method of geometric loci of "centers", i.e., points equidistant from several positions of the same particle of a moving plane [cf. the author, same Trudy 1, 181-216 (1947); these Rev. 12, 136]. Problem 1: Given (a) two positions S_1, S_2 of a driving member S ; (b) the corresponding positions of the driven member Q , and the instant center positions T_1, T_2 for S_1 and S_2 ; to find a connecting rod AB for S and Q so that Q_1, Q_2 are dead points for AB . Problem 2: Given (a) three positions S_1, S_2, S_3 of a driving member S ; (b) the corresponding positions of the driven member Q , and (c) the instant center T_1 for S_1 ; to find a connecting rod AB for S and Q so that Q_1 is a dead point for AB . These problems were solved by H. Alt [Maschinenbau, der Betrieb 19, 173-176 (1940)=Getriebetechnik, Reuleaux-Mitteilungen 8, 17-20 (1940); Z. Angew. Math. Mech. 5, 337-346 (1925)] by a reduction to a four-position problem and the theory of Barnester curves. The present paper reduces them, respectively, to the loci of (1) intersections O of T_1A_1 and T_2A_2 , with $OA_1=OA_2$, and arbitrary given T_1 and T_2 , and (2) centers O for three corresponding particle positions A_1, A_2, A_3 with O collinear with T_1 and A_1 , T_1 arbitrary given. Some simplified special cases are considered.

A. W. Windheiler (Chicago, Ill.)

Reviews,

Vol.

No.

C. HERKUDINOV, S. A.

Cerkudinov, S. A. On a family of double-crank four-hinge linkages. Akad. Nauk SSSR, Trudy Sem. Teorii Mashin i Mehanizmov 2, 150-155 (1947). (Russian)

The extreme angular velocities (a.v.) ω_1, ω_2 of the driven member O_2B of a four-hinge linkage (for a constant a.v. ω of the driving member O_1A) occur when the instant-center line TP is normal to the connecting rod $AB=b$ ($T=AB \times O_1O_2$; $P=O_1A \times O_2B$). This corrects some older erroneous statements [Kraus, Maschinenbau 18, 37-41, 93-94 (1939)]. A class of mechanisms is defined by the condition that the extremes occur when $AB \perp O_1O_2$, while $O_1A=O_2B$. If $O_1A=a, O_1O_2=l, a>l, AB=b$, then $l^2=H(H+2a), \omega_1\omega_2=\omega^2$. Both cranks turn through the same angle α between the extremes. A tabulation of the corresponding values of $a, l, b, l, \omega_1, \omega, \omega_2$, and ABO_2 is given. A. W. Wunderliker (Chicago, Ill.).

Mathematical Reviews,

Vol 17

CHERKUDINOV, S. A.

Cherkudinov, S. A. On the extremal velocities of slider-crank mechanisms. Akad. Nauk SSSR. Trudy Sem. Teorii Masin i Mechanizmov 2, 156-163 (1947). (Russian)

Continuing the paper reviewed above, the author studies the extrema i of the transmission ratio between the members of the turning-block linkage with an offset C ACO [O_a, O are fixed hinges; A a hinge sliding along AC ; $AC \perp CO$; CO the offset]. Let $AT \perp AC$, $T = AT \times OO_a$, $P = O_aA \times OC$, $Q = O_aO \times AC$ (the cross indicates intersection). Then, if $PT \parallel AC$, T is an extreme position of the instant center of AC relative to O_aA because its velocity is zero. If i is the corresponding transmission ratio, then $O_aQ = OO_a^2 / (i - 1)^2$. Constructions for a given i (max or min) are presented, and the relation $2i_{\max}i_{\min} = i_{\max} + i_{\min}$ derived. The value i of either i_{\max} or i_{\min} defines the linkage dimensions. For $i < \frac{1}{2}$ a quick-return mechanism (Whitworth), $O_aA < OO_a$, is obtained. For $i > \frac{1}{2}$ both members revolve. The case $i = \frac{1}{2}$ is singular since $i_{\max} = i_{\min}$ and the transmission ratio is constant. For $i < \frac{1}{2}$ the mechanism gets deadlocked if AC is the driving member. Other differences are noted in the transmission ratio, corresponding with an interchange of the driving and driven members.

A. W. Wundheiler (Chicago, Ill.).

Source: Mathematical Reviews.

Vol 12 No. 5

CHERKUDINOV, S. A.

Cherkudinov, S. A. On the curvature of conjugate profiles of circular wheels. Akad. Nauk SSSR. Trudy Sem. Teorii Mashin i Mekhaniki. 9: 52-54 (1947). (Russian)

Let two conjugate profiles P_1, P_2 of two circular gears of centers O_1 and O_2 have the curvature centers M_1 and M_2 corresponding to the instant point of contact C . The four-hinge linkage $O_1M_1M_2O_2$ is a linkage of the second order. The same relative motion of O_1M_1 and O_2M_2 as inst. of the planes P_1, P_2 . From this a simple proof is derived of the following theorem: The instant center of P_1 relative to P_2 is the foot of the perpendicular on M_1M_2 from $P = O_1M_1 \times O_2M_2$ (Bobillier). A. W. Wundheiler (Chicago, Ill.).

Source: Mathematical Reviews.

Vol. 19 No. 1

CHERKUDIMOV, S. A.

Cherkudinov, S. A. The angle of transmission in four-hinge linkages. Akad. Nauk SSSR. Trudy Sem. Teorii Mashin i Mekhaniz. 3, no. 9, 55-59 (1947). (Russian)

If O and C are the fixed hinges of a four-hinge linkage OAB^*C , and OA is a crank, the angle $ABC = \mu$ is the "transmission angle." Grashof's "crank condition" is refined to express μ ($\mu = 180 - \mu_0$, $\mu_0 = \arcsin(20^\circ)$) in terms of $r_1 = OB/OC$, $r_2 = CB/OC$, $r_3 = AB/OC$. For a given r_1 , the point (r_2, r_3) is confined to an arc at the top of an ellipse. This arc reduces to a point when $r_1 \leq r_2 + r_3 - (r_2 - r_3) \sin \mu_0$. This is the maximum of r_3 for a given r_2 . The case $\mu_0 = 0$ ($0 < \mu < 180^\circ$) defines a single-crank linkage is examined in some detail (the crank must be the smallest member). A (r_2, r_3) -graph for linkages of $\mu = 30^\circ$ and a set of r_1 values ($C = 0.58$) is given.

A. W. Woodheller (Chicago, Ill.).

Source: Theoretical Reviews,

Vol

No. 4

CHERKUDINOV, S. A.

AIK

Mechanics, (Dynamics, Statics/Kinematics)

3470. Cherkudinov, S. A., On the design of four-hinge linkages generating approximately uniform motion (in Russian), *Ugol. Nauch. Issled. Trud. Ser. Tekhn. Nauk. M. 14*, 3, 9, (2) 11, 1917.

A point B of the coupler rod AB of a turning block linkage (O_1A , O_1O_2 fixed, O_1A -crank, A -pivot, O_2 -slider crank) can be made to trace a near circle. [Of a few pertinent references, we shall mention only the most recent one: Z. S. Blokh, see Rev. 3473 in this issue.] The author observes that if the center C of this circle is on the frame bar O_1O_2 , the motion of M will be uniform. The four-hinge linkage O_1ABC with O_1C fixed will then yield approximately uniform circular motion of C if O_1A rotates uniformly. The Blokh solution is used for the dimensioning of this four-hinge in terms of the transmission ratio, which must be between 0.5 and 2. Either both cranks revolve, or they both oscillate. A linkage is determined for which C has instantaneously zero accelerations of the first and second orders. The locus of the corresponding positions of A for a given i is a circle symmetric about O_1O_2 .
A. W. Wundtoller, URA

AS 254 METALLURGICAL LITERATURE CLASSIFICATION

CHERKODINOV, S.A.

Cherkodinov, S. A. On some general questions of the synthesis of link mechanisms. *Mosk. Nauch. Issled. Inst. Priklad. Mekh.* 1964, no. 3, pp. 10-11.

The author discusses the concept of a mechanism (the kinematic assembly) of a multibody system. The work is devoted to properties of closed kinematic chains subject to the same slider on the ground (to the slider), and angular outlets (outlets) between adjacent sliders. The maximum number of moving links (dimension) is $3n - n - 5$, where $n + 1$ is the number of links and n the number of sliders. In this regard, the design is given an input (I) and output (O) link. Since the design is given are not invariant under a transformation of the parameters defining the dimensions, an interpretation of the paper seems in order. For a standard input motion, the output need not depend essentially on all the dimensions. Transform the dimensions so that the out-

put depends on some new parameters q essentially and only; the remaining ones must be chosen arbitrarily, and the output will then "primarily" depend on them. The given output will then depend on relations between the q 's. From them the author concludes that these relations must be of the form $q_i = q_j^k$ (see Eq. 1.4). The author also notes that the design problem and its solution are not unique. The solution will be all their dimensions (actual design parameters). This may be varied by another variable specifying the associated positions of (I) and (O) (the author sees two new variables here). This ends the count of the unknowns involved in the design problem. The remaining half of the paper consists of highly obvious remarks on the number and kind of conditions that may be imposed on the input-output relationship in the attempt to approximate a given performance (higher order contacts, etc.).

A. W. Wautke (Chicago, Ill.).

Source: Mathematical Reviews,

Vol. 28 No. 2

CHERKVDINOV, S. A.

Čerkudinov, S. A. The method of best approximation in the synthesis of mechanisms. *Izvestiya Akad. Nauk SSSR. Otd. Tehn. Nauk* 1948, 1517-1530 (1949). (Russian)

The problem proposed is to approximate a curve (1) $g(x, y) = 0$, where g is a polynomial, by the trajectory $x = x(z)$, $y = y(z)$, z and y polynomials in z , of a point D of the connecting rod of a four-bar linkage. If the curve (1) is embedded into a family $Q(x, y; t) = 0$, where Q is a polynomial in x, y and $Q(x, y; 0) = g(x, y)$, the equation (2) $g(x, t) = Q(x(z), y(z); t) = 0$ arises, where g is a polynomial in z and depends also on the dimensions of the linkage. If the latter are so chosen that equation (2) is satisfied "as nearly as possible," the author regards the problem as solved. The definition of the best possible approximate compliance with the equation $g(z, t) = 0$, for $z_0 \leq z \leq z_1$, and $|t| \leq L$, claimed to be superior to that of Čebyšev, is the following.

(a) The extrema of t shall all have the same absolute value L . (b) The number m of the extrema shall be a maximum for all the possible dimensions of the linkage. (c) At the endpoints of the interval (z_0, z_1) the t values are $-L$ and L .

The determination of the "best approximation" proceeds by successive attempts to make m equal to $n, n-1, \dots$. If $m = n$ is attempted, t_0, \dots, t_{n-1} must exist satisfying

$$g(z, L) = (z - z_1)^2(z - z_2)^2 \dots (z - z_{n-1})^2$$

and

$$g(z, -L) = (z - z_0)^2(z - z_2)^2 \dots (z - z_{n-1})^2$$

Familiar formulas then establish a set of expressions of the values of the coefficients of g at $t = \pm L$ as polynomials in z_0, \dots, z_{n-1} . Since these values depend on the linkage parameters, elimination of the z 's results in a set of equations for these parameters. If these equations are not compatible, $m = n - 1$ is tried, and so forth. Examples are given and applications to Watt's linkage and crankshaft curves presented with numerical illustrations. *A. W. Wunderliker.*

Source: **Mathematical Reviews,** Vol 10 No. 6

CHEKUDINOV, S. N.

ANK

Mechanics (Dynamics
Statics, Kinematics)

23

1100. Chekudinov, S. A. On the design of slider-crank mechanisms generating approximately uniform motion (in Russian). *Trudy SSSR Fizi. Sem. Fiz. Math. Nauk* 5, 18, 5-23, 1918.

This paper further exploits the idea of the preceding one: If the point *B* of the coupler *A* of a turning-block linkage moves on a perpendicular γ to the frame *OT*, its motion is almost uniform. The author hence applies Chebichev's method to solve the problem of rectilinear guidance for the turning block linkage. If now *B* is connected with γ by means of a slider crank, and the turning block is suppressed, a slider-crank linkage is obtained with almost uniform slider motion. The dimensioning (in terms of the lengths of crank and slider travel and the velocity error) is discussed in detail. It is shown that the linkage crank cannot be a revolving one. A. W. Wundheiler, USA

18/1/51

ASST. SEA METALLOGICAL LITERATURE CLASSIFICATION

1100-50417
1100-50417

CHERKUDINOV, S. A.

Cherkudinov, S. A. On a method of approximation in the synthesis of mechanisms. *Izv. Akad. Nauk SSSR, Tekhn. Sem. Teoriya Mashin i Mehanizmov* 5, no. 20, 34-77 (1948). (Russian)

The paper expands a previous version [Izvestiya Akad. Nauk SSSR Otd. Tekhn. Nauk, 1948, 1512-1530; these Rev. 10, 409]. The present version consists of: (1) utilization of Descartes' rule, (2) more complete treatment of special cases ($m = n = 2, 3, 4$); see the original for details, and (3) more detail in the construction of approximate ellipses and hyperbolas by a slider crank and a "lambdoid" four-bar linkage ($OO_1AB, O_1O_2AB, O_2B = B_1 = B_2, D$ the tracing point). There are some problems with Bode's modified Chebyshev method [Izv. Akad. Nauk SSSR, Otd. Tekh. [Izvestiya Akad. Nauk SSSR, 1946, 683-696; these Rev. 8, 100], the method of assuming that no singularity of $q(x, y)$ guarantees that the curve is close to the curve $q(x, y) = 0$. In the author's method a maximum of true intersections with the general curve is required.

A. W. Wundtneiler (Chicago, Ill.).

Source: Mathematical Reviews,

Vol 12 No. 5

CHERKUDINOV, S. A.

Cerkudinov, S. A. Design of some mechanisms approximating uniform motion. Akad. Nauk SSSR. Trudy Sem. Teorii Mašin i Mehanizmov 6, no. 21, 5-26 (1949). (Russian)

In the original Chebyshev method the approximating function is given explicitly as a linear combination of an appropriate sequence of functions. The author proposed a modification of the method in which the approximating function is defined as an implicit function of the form $F(z, \theta) = 0$, F being a polynomial in z . If θ is a constant, Chebyshev's criterion requires a maximum number of oscillations at constant amplitude for the best approximation (the author does not discuss the case of variable θ). The procedure was described in previous papers [Izvestiya Akad. Nauk SSSR, Old. Tehn. Nauk 1948, 1517-1530; same Trudy 5, no. 20, 34-77 (1948); these Rev. 10, 409; 12, 363]. Here it is applied

to generation of nearly uniform motion by means of the turning block linkage. O_1A , OB fixed, OA is the crank, B, I slides through A with the following generated functions: (1) $r = \tan ABO$, (2) $r = \sin ABO$ and also to the motion of the slider of the slider-crank linkage with offset. The maximum deviations and range of approximation are computed. A. H. H. *Washburn* (Chicago, Ill.)

Source: Mathematical Reviews,

Vol. 12 No. 7

SMW
ABZ

CHERKUDINOV, S. A.

Cherkudinov, S. A. "Some applications of the method of rotating motion," Trudy Seminara po teorii mashin i mekhanizmov (Akad. nauk SSSR, In-t mashinovedeniya), Vol. VI, Issue 24, 1949, p. 45-47, - Bibliog: 9 items.

SO-U-4630, 16 Sept. 53, (Letopis 'Zhurnal 'nykh Statey, No. 23, 1949).

CHERKUDINOV, S.A.

Mathematical Reviews
May 1954
Mechanics

(2)
Cherkudinov, S. A. Method of multiple interpolation in the
synthesis of mechanisms. Akad. Nauk SSSR. Trudy
Sem. Teori Mashin i Mehanizmov 10, no. 40, 5-18 (1951).
(Russian)

NET

CHEKUDINOV, S. A. and SPERANSKIY, N. V.

"Synthesis of Flat, Hinged Mechanisms with Stops," Trudy Sem. teor. mash.,
11, No.43, 1951

SOV/124-58-1-158
Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 1, p 18 (USSR)

AUTHORS: Levitskiy, N. I., Cherkudinov, S. A.

TITLE: Modern Trends in the Development of the Theory of Synthesis of
Mechanisms for Automatic Machinery (Sovremennyye napravleniya
v razvitii teorii sinteza mekhanizmov mashin-avtomatov)

PERIODICAL: Sessiya AN SSSR po nauchn. probl. avtomatiz. proiz-va, 1956,
Vol 6. Moscow, AN SSSR, 1957, pp 81-92

ABSTRACT: Bibliographic entry

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CHERKUDINOV, S.A. ; SPERANSKIY, N.V.

Suggested type for maltese cross gear. Trudy Sem.po teor.mash.
15 no.60:28-44 '56. (MLRA 9:11)
(Gearing)

CHERKUDINOV (Cand. Tech. Sci.) Levitskiy N.I. (Dr. Tech. Sci.)

Basic tasks of planning mechanisms of automatic machines.

paper read at the Session of the Acad. Sci. USSR, on Scientific Problems of
Automatic Production, 15-20 October 1956
Avtomatika i telemekhanika, No. 2 p 182-192, 1957

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CHERKUDINOV, S.A.; SPERANSKIY, N.V.

Using the method of multiple interpolative approximation for
the synthesis of four-link transmission mechanism. Trudy Inst.
mash.Sam. po teor. mash. 17 no.67:46-77 '57. (MIRA 11:2)
(Mechanical movements)

CHERKUDINOV, S. A.

S. A. Cherkudinov, "On the Theory of the Burmester Curves and Points."

paper presented at the 2nd All-Union Conf. on Fundamental Problems in the Theory of Machines and Mechanisms, Moscow, USSR, 24-28 March 1978.

C H E R K A D I N O V , S . A .

85(2) PAGE 1 BOOK EXPLANATION 807/263

Abstrakty nauki SSSR. Institut mashinovedeniya. Seminar po teoriu mashin i mekhaniki
Sob. 10, vyp. 71 (Transactions of the Institute of Mechanical Engineering,
Academy of Sciences, USSR. Seminar on the Theory of Machinery and Mechanisms,
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A.Ye. Khrinitskiy, Doctor of Technical Sciences; S.I. Levitskiy, Doctor of
Technical Sciences, Professor; P.P. Ryzhenko, Candidate of Technical Sciences;
L.S. Maslov, Doctor of Technical Sciences, Professor; and M.A. Shuridin,
Doctor of Technical Sciences, Professor.

PURPOSE: This collection of articles is intended for scientific research workers
and engineers.
COVERAGE: This collection of articles deals with the following topics: three-
control in textile machines, pneumatic devices with diaphragm, resonances in
centrifugal pumps, the dynamics of electrically driven machinery, synthesis
of four-link transmission mechanisms, and the design of link mechanisms. No
personalities are mentioned. References follow several of the articles.

Contributors: S.A. and N.Y. Svyatskiy, Synthesis of Four-bar Linkage Mechanisms
by the Method of Interpretive Approximation With One Mode of High Multiplicity 69
by the Method of Interpretive Approximation With One Mode of High Multiplicity 69
Volume 1, Number 67, 1971, under the same title. Methods developed in the
first part are applied to the synthesis of the slider-crank mechanism.

Grodzinskiy, L.S. Design of Linkage Mechanisms for a Given Time of Dwell of
The Follower Link 69
Methods for designing link mechanisms with a dwell in the extreme position
(Cebrysher mechanisms) are discussed.

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CHERKUDINOV, S.A.; SPERANSKIY, N.V.

Using the method of interpolative approximation with a single high-multiplicity unit for the synthesis of four-link transmission mechanisms. Part 2. Trudy Inst.mash.;Sem.po teor. mash. 18 no.71:60-68 '58. (MIRA 12:1)
(Mechanical movements)

PHASE I BOOK EXPLOITATION

SOV/3574

Cherkudinov, Sergey Aleksandrovich

Sintez ploskikh sharnirno-rychazhnykh mekhanizmov; zadachi o vosproizvedenii nepreryvnoy funktsii na zadannom otrezke (Synthesis of Planar Linkages; Problems of Reproduction of Continuous Function on a Given Interval) Moscow, Izd-vo AN SSSR, 1959. 321 p. (Series: Problemy teorii mashin) Errata slip inserted. 2,200 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut mashinovedeniya.

Ed.: A. A. Blagonravov, Academician; Ed. of Publishing House: A. I. Kudashev; Tech. Ed.: G. A. Astaf'yeva; Editorial Board of Series: I. I. Artobolevskiy, Academician (Resp. Ed.), A. A. Blagonravov, Academician, N. G. Bruyevich, Academician, V. I. Dikushin, Academician, S. V. Serensen, Academician, UkrSSR, S. V. Pinegin, Doctor of Technical Sciences, Professor, N. I. Levitskiy, Doctor of Technical Sciences, Professor, F. M. Dimentberg, Doctor of Technical Sciences, A. Ye. Kobrinskiy, Doctor of Technical Sciences, N. P. Rayevskiy, Candidate of Technical Sciences, and A. P. Bessonov, Candidate of Technical Sciences (Scientific Secretary).

Card 1/15

Synthesis of Planar Linkages (Cont.)

SOV/3574

PURPOSE: This book is intended for engineers interested in the theory of linkage design.

COVERAGE: This book presents analytic and graphoanalytic methods of solving link mechanism problems based on Burmester's theorem. Chapters I and II provide a general statement of the problem of approximate synthesis of link mechanisms and a brief survey of literature pertaining to the method of approximate synthesis. Chapters III and IV cite necessary data from kinematic geometry. Some problems of the synthesis of four-bar linkages by positions are presented which make use of these data in solving problems of the synthesis of mechanisms by the reproduction of a function on a given interval. In Chapters V - VIII the analytic and graphoanalytic methods of computing all parameters of the kinematic design of a four-bar linkage, crankgears, and gear mechanisms by the conditions of the interpolated approximation with double nodes are presented. Chapters IX and X are devoted to a search for the parameters of a kinematic design of these mechanisms according to the conditions of the best approximation. In Chapters XI - XIII a solution is given for problems of the synthesis of 4-link and 6-link mechanisms according to a partial number of the parameters of kinematic design. Decreasing the number of parameters of a kinematic design reduces the accuracy of the reproduction of the function on the given interval but it simplifies the location of constructively usable results. The solutions of all problems are illustrated by ex-

Card 2/15

Synthesis of Planar Linkages (Cont.)

SOV/3574

amples. The author thanks Academicians I. I. Artobolevskiy and A. A. Blagonarov for their interest and N.V. Speranskiy for making the calculations. There are 166 references: 96 Soviet, 61 German, 2 French, and 7 English.

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3. Examples of using link mechanisms in machine tool production for the reproduction of a continuous function on a given interval	10
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5. Transmission and control mechanisms	16

~~Card 3/15~~

CHERKUDINOV, S.A.

25(1) PHASE I BOOK EXPLOITATION SOV/2383

Akademiya nauk SSSR. Komissiya po tekhnologii mashinostroyeniya Avtomatizatsiya mashinostroyeniya. t. III. Privedeniye v uporyadok... (Automation of Machine-Building Processes. Vol. 3. Drives and Control Systems for Process Machinery) Moscow, Izdat AN SSSR, 1959. 370 p. Errata slip inserted. 5,000 copies printed.

Ed. i V.I. Dikushin, Academician; Ed. of Publishing House: Dr. Ioffe; Tech. Ed.: I.P. Kuz'min.

PURPOSE: This book is intended for engineers dealing with automation of various machine-building processes.

COVERAGE: This is the second volume of transactions of the second Conference on Special Mechanization and Automation of Manufacturing Processes, held September 25-29, 1956. The present volume contains three parts, the first dealing with automation of measuring methods. The subjects discussed include automatic control of dimensions of machined parts, inspection methods for automatic production lines, in-process inspection devices, application of electronics in automating linear measuring processes, and machines for automatic inspection of bearing races. The second part deals with automatic control and control systems for process machinery; including application of digital computers in the control of metal cutting machine tools, reliability of relay systems, application of gas-tube frequency converters, and control of induction motor speeds, magnetic amplifiers, and their use in automatic systems, hydraulic drives, and ultrasonic vibrators. Part three deals with mechanisms of automatic machines and automatic production lines. The subjects discussed include linkage, indexing, and Geneva-wheel-type mechanisms, friction drives, automatic loading devices, diaphragm-type pneumatic drives, various auxiliary devices for automatic production lines, and methods of design and accuracy of cams. No personalities are mentioned. There are no references.

Makharadze, Ya. G. Dynamics and Type of Wear of Geneva-wheel Mechanisms 210

Shekhvits, E.I. Study of Indexing Mechanisms for Tables and Drums of Automatic Machines 222

Cherkudinov, S.A. Linkage Mechanisms of Heavy-duty Drawing Presses 253

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Prav, V.P. Some Problems in the Theory of Loading and Positioning Devices 278

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Kamyshnyy, M.I. Vibratory Loaders for Machine Tools 311

Rubtsov, P.I. Experience Gained by the Avtozavod Izmertilicheskaya in Developing Standard Mechanisms for Automating Auxiliary Operations in Metal-cutting Machine Tools 326

Gajda, Ye. N. Designing Diaphragm-type Pneumatic Drives 336

Bron, L.S. Standard Auxiliary Devices for Automatic Lines 352

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CHERKUDINOV, S.A.

25(2)

PHASE I BOOK EXPLOITATION

SOV/2285

Artobolevskiy, Ivan Ivanovich, Nikolay Ivanovich Levitskiy, and
Sergey Aleksandrovich Cherkudinov

Sintez ploskikh mekhanizmov (Synthesis of Planar Mechanisms)
Moscow, Fizmatgiz, 1959. 1084 p. 10,000 copies printed.

Ed.: A. Ye. Kobrinskiy; Tech. Ed.: N. Ya. Murashova.

PURPOSE: The book is intended for scientific research workers,
engineers, designers, Lecturers, and students in advanced courses
at schools of higher technical education.

COVERAGE: The book discusses exact and accurate methods of the
synthesis of mechanisms. Problems solved by algebraic methods
are distinguished from problems solved by geometrical methods.
In some cases suggestions are made for the application of the method
being discussed to particular space mechanisms. The uses of
general methods of synthesis are illustrated by examples. A
list of basic literature is presented. It includes works
published up to 1957. The Introduction contains historical and
bibliographical information on the development of the theory

Card 1/10

Synthesis of Planar Mechanisms

SOV/2985

of the synthesis of mechanisms. The authors thank Professor Ya. L. Geronimus, Doctor of Physical and Mathematical Sciences, and A. Ye. Kobrinskiy, Doctor of Technical Sciences, for their comments and suggestions. There are 285 references: 172 Soviet, 81 German, 19 English, 12 French, and 1 Latin.

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2. Four-link mechanisms	44
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CHERKUDINOV, S.A.; MAYSYUK, L.B.

Synthesis of an intermittent hinged-pair mechanism. Trudy Inst.mash.
Sem. po teor.mash. 21 no.81/82;93-118:160. (MIRA 13:11)
(Mechanical movements)

CHERKUDINOV, S.A.; SPERANSKIY, N.V.

Design of a balancing spring mechanism. Trudy Inst.mash. Sem. po teor.
mash. 21 no.81/82:4-11 '60. (MIRA 13:11)
(Balancing of machinery)

S/014/62/000/005/006/072
C111/C333

AUTHOR: Cherkudinov, S.A.

TITLE: The Burmester curves for the case where three positions of a plane figure are infinitesimally close

PERIODICAL: Referativnyy zhurnal, Matematika, no. 5, 1962, 66-67, abstract 5A422. ("Tr. In-ta mashinoved. AN SSSR. Seminar po teorii mashin i mekhanizmov". 1961, 21, no. 83-84, 133-162)

TEXT: As Burmester curves the author designates the curve of the circular points as well as the curves of the centers which are connected with the examination of the four positions of a plane figure S being moved in its plane. The known case where three of the four positions of S are infinitesimally close to each other is used to graphically determine the parameter of a six link hinge-mechanism with a fixed point. The author obtains the equations of Burmester curves for this case, finds new properties of these curves and gives a method for their construction. A family of curves of the centers is determined through

Card 1/1

The Burmester curves for the case ...

3/04-07/000/005/006/072
0111/0333

three nodes are considered, of which two are the points of tangency of these curves and one is their intersection. This family of curves is used in the synthesis of a six link hinge-mechanism with fixed point, which consists of four link hinge mechanisms joined together, and in particular the precision of the fixed point of the guiding link of this mechanism is estimated.

extractor's note : Complete translation.

Card 2/2

CHERKUDINOV, S. A. (Moscow)

"The use of electronic analogue and digital computers in kinematic synthesis of mechanisms".

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 January - 5 February 1964.

LEVITSKIY, N.I., doktor tekhn. nauk prof., otv. red.; BLAGONRAVOV, A.A., akademik, red.; BESSONOV, A.P., doktor tekhn. nauk, red.; DIMENTBERG, F.M., doktor tekhn. nauk, prof., red.; ZINOV'YEV, V.A., doktor tekhn. nauk, prof., red.; KOBRINSKIY, A.Ye., doktor tekhn. nauk, red.; CHERKUDINOV, S.A., doktor tekhn. nauk, red.

[Current problems in the theory of machines and mechanisms] Sovremennye problemy teorii mashin i mekhanizmov. Moskva, Nauka, 1965. 342 p. (MIRA 19:1)

1. Moscow. Gosudarstvennyy nauchno-issledovatel'skiy institut mashinovedeniya.

KAL'YANOV, T.A., inzhener; BREZHNEV, Ya.I., inzhener; RUDNITSKIY, L.S.,
inzhener; KOTESHOV, N.P., inzhener; YEZERSKIY, B.B., inzhener;
CHERKUN, N.A., inzhener; SUSLOVICH, Z.I., inzhener; ZABELIN, N.K.,
inzhener.

Improving the quality of cast-iron rolls for shape rolling.
Stal' 16 no.7:647-649 J1 '56. (MLRA 9:9)

1. Zavod imeni Dzerzhinskogo, Dnepropetrovskiy chugunoval'-
tsedelatel'nyy zavod i Dnepropetrovskiy metallurgicheskiy
institut.

(Rolls (Iron mills)--Quality control)

SOV/137-58-8-16868

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 92 (USSR)

AUTHOR: Cherkun, N.A.

TITLE: Quality and Rational Selection of Merchant-mill Rolls (Kachestvo i ratsional'nyy podbor sortoprokatnykh valkov)

PERIODICAL: Tr. Nauchno-tekhn. o-va chernoy metallurgii. Ukr. resp. pravl., 1957, Vol 2, pp 228-234

ABSTRACT: Soviet industry today produces 50 different types of rolls. The rolls fall into the following categories relative to metal quality: Chilled alloyed, semi-hard unalloyed, chilled magnesium alloy, semihard magnesium alloy, and unalloyed. It is recommended that the selection of the type of roll be based on the curve of hardness drop across its section in relation to the depth of groove incision. If this is small (depths up to 20 mm) it is necessary to use chill rolls chill-cast with smoothing. When groove depths reach 50 mm, the rolls should be of Mg ductile iron chill-cast with smoothing. If the depth of groove is even greater and it is not possible to cast in a shaped chill it is necessary to use rolls chill-cast with smoothing with loam.

Card 1/2

Note is taken of the increase in the use of rolls made of ductile

SOV/137-58-8-16868

Quality and Rational Selection of Merchant-mill Rolls

iron inoculated with Mg. USSR industry has recently perfected the casting of rolls in shaped chills. This increases roll life by 2-5 times.

M.Z.

1. Rolling mills--Equipment
2. Rolling mills--Materials
3. Rolling mills--Design

Card 2/2

KRIVOSHEYEV, A.Ye.; RUDNITSKIY, L.S.; BELAY, G.Ye.; NIKOLAYEV, N.A.;
Prinimali uchastiye: PARSHIN, A.I.; KNYAZHANSKIY, M.U.; BELYY, N.I.;
CHERKUN, N.A.; NECHAYEVA, Z.A.; LEV, I.Ye.; BUNINA, Yu.K.

Iron mill rolls of cerium cast iron. Stal' 23 no.3:278-282 Mr
'63. (MIRA 16:5)

1. Dnepropetrovskiy metallurgicheskiy institut (for Krivosheyev,
Rudnitskiy, Belay, Nikolayev, Lev, Bunina). 2. Dnepropetrovskiy
chugunoval'nyy delatel'nyy zavod (for Parshin, Knyazhanskiy, Belyy,
Cherkun, Nechayeva).

(Rolls (Iron mills))

KIPER, Ye.V., kand.tekhn.nauk; CHERKUN, V.Ye., kand.tekhn.nauk; MOROZOV, V.I.,
inzh.; BOGAYEVSKIY, V.A.

Precision in machining holes on the body of hydraulic distributors
by various methods. Trakt. i sel'khoz mash. no.9:41-42 S '65.
(MIRA 18:10)

1. Melitopol'skiy institut mekhanizatsii sel'skogo khozyaystva
(for Kiper, Cherkun, Morozov). 2. Glavnyy tekhnolog Melitopol'skogo
agregatnogo zavoda (for Bogayevskiy).

CHERKUN, V.Ye. [Cherkun, I.V.], inzh.-mekhanik

Repairing locking devices of tractor hydraulic systems. Mekh.
sbl'.hosp. 11 no.3:24-25 Mr '60. (MIRA 13:6)
(Tractors--Hydraulic equipment)

CHERKUN, V.Ye., inzh.-mekhanik

How to prevent the overloading of engines during the running-
in process. Mekh. sil'. hosp. 11 no.10;15-16 0 '60.

(MIRA 13:9)

(Tractors--Engines)

UDALOV, Iosaf Petrovich; SMELOV, Aleksandr Petrovich [Smielov, O.P.];
CHERKUN, Vladimir Yefimovich; OLEFIRENKO, G.A. [Olifirenko, H.A.],
red.; NEMCHENKO, I.Yu., tekhn. red.

[Repairing checking and measuring devices for tractors] Remont
avtotraktornykh kontrol'no-vymiriival'nykh pryladiv. Kyiv, Derzh-
sil'nospyday URSS, 1961. 39 p. (MIRA 15:6)
!! (Tractors--Maintenance and repair)

CHERKUN, V. Ye.

"An Investigation of the Process of the Control Test of
Overhauled Tractor Diesel Engines of Limited Horsepower";

dissertation for the degree of Candidate of Technical Sciences
(awarded by the Timiryazev Agricultural Academy, 1962)

(Izvestiya Timiryazevskoy Sel'skokhozyaystvennoy Akademii, Moscow, No. 2,
1963, pp 232-236)

CHERKUN, V.Ye. [Cherkun, V.IE.], kand. tekhn. nauk

Hydraulic intensifier in the power steering of the T-40
tractor. Mekh. sil'. hosp. 14 no.9:21-22 S '63.
(MIRA 17:1)

KIPER, Ye.V., kand. tekhn. nauk; CHERKUN, V.Ye., kand. tekhn. nauk;
MOROZOV, V.I., inzh.; BOGAYEVSKIY, V.A.

Errors in machining the body-slide valve pair of hydraulic
distributors. Trakt. i sel'khoz mash. 33 no.11:40-42 N '63.
(MIRA 17:9)

1. Melitopol'skiy institut mekhanizatsii sel'skogo khozyaystva
(for Kiper, Cherkun, Morozov). 2. Glavnyy tekhnolog Melito-
pol'skogo agregatnogo zavoda (for Bogayevskiy).

CHERKUN, V.Yu. [Cherkun, IU.]

Testing oil coolers and oil pipes on the USIN-1 stand. Mekh.sil'.
hosp. 9 no.3:16-17 Mr '58. (MIRA 11:4)

1. Melitopol's'kiy institut mekhanizatsii sil's'kogo gospodarstva.
(Tractors--Engines--Testing)

CHERKUN, V.Yu., kand.tekhn.nauk; DOROFEYEV, A.L. [Dorofeiev, A.L.], inzh.-mekhanik

For reliable operation of hydraulic systems. Mekh. sil'. hosp. 14
no.6:17-19 Je '63. (MIRA 17:3)

CHERKUNOV, B.F., aspirant

New modification of an operation in ectropion palepebrae and
eversion of the lower lacrimal punctum. Oft. zhur. 16 no.4:
245-247 '61. (MIRA 14:7)

1. Iz glaznoy kliniki (zav. - prof. T.I. Veroshevskiy) Kuybyshevskogo
meditsinskogo instituta.

(LACRIMAL ORGANS—SURGERY)

DIDENKO, N.A.; CHERLENEVSKAYA, I.Ye.

Nature of the Pelcha and Rava-Russkaya dislocations. Geol. sbor.
[Lvov] no.4:163-170 '57. (MIRA 13:2)

1. Ukrnefterasvedka, L'vov.
(Russian Platform--Geology, Structural)

DZ'UBENKO, M.G.; CHERLINKA, N.G.; YAKOVLEVA, L.A., red.

[Transportation and delivery system of opening deposits in the Krivoy Rog Basin; report at the All-Union Conference of Coal Industry Planners] Transportno-vydachnaia skhema vskrytiia mestorozhdenii Krivorozhskogo basseina; doklad na Vsesoiuznom soveshchanii projektirovshchikov v ugol'noi promyshlennosti. Moskva, Inst. gornogo dela im. A.A. Skochinskogo, 1964. 26 p. (MIRA 18:3)

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S/661/61/000/006/056/081
D267/D302

AUTHORS: Shnobl', L., Chermak, I. and Dvorzhak, M.

TITLE: Evaluating the activity of silicon-copper alloys used for the direct synthesis of methyl-chlorosilanes

SOURCE: Khimiya i prakticheskoye primeneniye kremneorganicheskikh soyedineniy; trudy konferentsii, no. 6: Doklady, diskussii, resheniye. II Vses. konfer. po khimii i prakt. prim. kremneorg. soyed., Len. 1958. Leningrad, Izd-vo AN SSSR, 1961, 235-239

TEXT: The following results were obtained by the authors from an X-ray diffraction investigation of 10 specimens of these alloys: (1) The value of the lattice constant does not depend on Cu content and coincides with the constant for pure Si. (2) Since the alloying components cannot be identified as independent phases or as a compound, they must be present in the form of solid solution, both types of which are present in all alloys. (3) The presence of Cu and other impurities is manifested in the arising of satellite-

Card 1/2

X

Evaluating the activity ...

S/661/61/000/006/056/081
D267/D302

lines which accompany the main reflexions, whose arrangement can be explained quantitatively by the modulation of the constant of the Si crystal lattice. Since the calculated positions of satellites agree well with experimental values, it is concluded that the alloy presents pure Si with thin streaks of the hole-type solid solutions of the impurity atoms in Si. If there are fewer than 4 impurity atoms (in holes) in 11 cells, the inter-streak distance is 55 Å. When the number of atoms increases, this distance decreases down to 13.4 Å. It was found that such alloys were virtually inactive. Alloys containing not more than 4 atoms in 11 cells were active. A discussion followed in which Ya. I. Vabel' (Moscow) took part. There are 3 tables and 5 references: 2 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows: M. E. Straumanis, E. Z. Aka, J. Appl. Phys., 23, 330, (1952); M. E. Hargreaves, Acta Cryst., 4, 301, (1951); J. Bloem, F. A. Kroger, //Philips Rev. Rep., 12, 281, (1957).

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskogo sinteza, Pardubice (Scientific Research Institute of Organic Synthesis, Pardubice) ✓

Card 2/2

CERMAK, J.; BILEK, F.

Importance of skiagraphic examination of the hand and wrist in young boxers. Cas.lek. cesk. 104 no.6:151-154 12 F'65.

1. Vyzkumny ustav telovychovny v Praze (reditel: doc. dr. E. Eiselt) a Centralni rtg oddeleni Thomayerovy nemocnice v Praze Krci (vedouci: MUDr. F. Bilek).

CHERMAK, L.L.

CHERMAK, L.L.

Importance of chemical and thermal processes in a shaft furnace.
TSvet.met. 27 no.6:25-30 N-D '54. (MIRA 10:10)
(Smelting) (Blast furnaces)

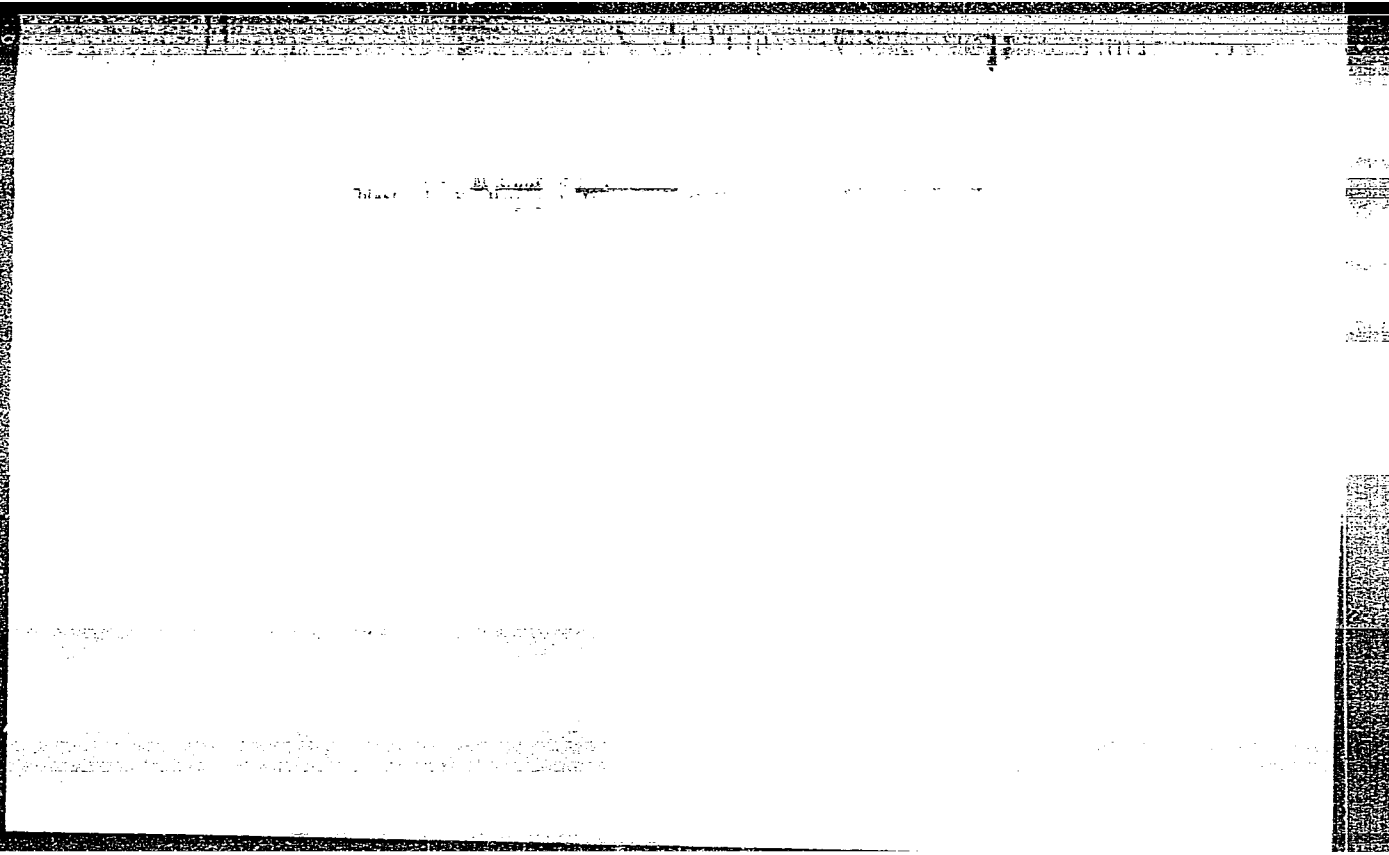
LYUMKIS, S.Ye. (Orsk); CHERMAK, L.L. (Orsk)

In defense of the ionic theory of the fusion of slag.

Izv.AN SSSR.Otd.tekh.nauk no.11:147-150 N '55.

(Slag)

(MIRA 9:2)



18
4E2c

The mechanism of mat-formation during shaft smelting of oxidized nickel ore // N. P. Dey, P. S. Kuragin, S. E. Lyubskis, and A. L. Chertanov. *Ukrainian Metall.* 29, No. 8, 50-53 (1959). — A petrographic and chemical analysis is made of the charge materials in a shaft smelting furnace at different levels above the tuyères. The typical furnace charge is oxide nickel ore 27, limestone 13, and coke 33%. It is found that gypsum is reduced at 3-5 ft. above the tuyère level. The primary sulfidation and reduction of the ore take place below the tuyère zone as a result of reactions in the liquid phase between the NiO and CaS formed by the reduction of CaO.

R. W. Guard

for RD
NT

Distrs: 4B2b/4B2c/4B4j

63

Silicate slags from nickel smelting. O. A. Esin, N.P.
Dokl. L. Chem. Acad. Sci. USSR 197.

intermittently or continuous operation. Expendable anodes are used in this process. The cathodic

1/1

Handwritten scribbles

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 1, p 60 (USSR) SOV/137-59-1-473

AUTHOR: Chermak, L. L.

TITLE: Method for the Liquid-phase Recovery of Cobalt From Converter Slags (Metod izvlecheniya kobal'ta iz konverternykh shlakov v zhidkikh fazakh)

PERIODICAL: Materialy Soveshchaniya po vopr. intensiv. i usoversh. dobychi i tekhnol. pererabotki medno-nikelevykh i nikelevykh rud. 1956 g. Moscow, Profizdat, 1957, pp 179-184

ABSTRACT: Bibliographic entry

Card 1/1

AUTHOR: Chernak, L. I.

136-9-7/14

TITLE: Extraction of cobalt from liquid converter slags by mixing with matte. (Izvlacheniye kobalta iz zhidkikh konvertornykh slakov sputo peremeshivaniyem s matnom).

PERIODICAL: *Elektnyye Metally*, 1957, No. 9, pp. 36-42 (USSR).

ABSTRACT: In this article laboratory and industrial tests on the extraction of cobalt from liquid converter slags are described on the basis of which a process has been successfully introduced at the Yuzhuralnikel' combine. The laboratory work was based on smelting in crucibles and some of the results, showing the influence of cobalt and sulphur concentrations on the value of equilibrium constant $(Co) \cdot [Fe] / [Co] (Fe)$, are plotted in Figs. 1 and 2, a curve of the activity of CaO in the slag against the concentration there also being given (Fig. 3). By X-ray and metallographic investigations of materials and a.n.f.- and radioactive-tracers methods, further information on factors influencing the extraction of cobalt was obtained. The authors conclude that the main conditions for high extraction during treatment of liquid slags are presence of a metallic component in the matte, a multi-stage enrichment of the matte with cobalt, mixing of the melts.

Card 1/2

REC-1-7/14
Extraction of cobalt from liquid converter slags by ~~mining~~ with matte.

They describe the Yushuralnitel' process and state that its introduction has led to an annual economic effect of 20 million roubles. They consider further improvements possible. The following participated in the laboratory work: I. L. Rodoshivina, Y. A. Shestova, A. S. Fagan, V. G. Neustroyeva, A. I. Chumov, engineers, and V. K. Artyushenko and M. S. Feil'dte. The full scale process was developed by the authors in collaboration with V. V. Dredov, S. L. Eglitin, N. I. Shargin, S. Ye. Lyudskis and V. Yu. Kravtchik; it was introduced with the assistance of D. P. Chernyshev, A. I. El'tonov, Ya. Kh. Osipov and V. F. Tuzosov. There are 4 figures and 6 references, all of which are Russian.

ASSOCIATION: Yushuralnitel'.

AVAILABILITY: Library of Congress.

Card 2/2 1. Cobalt-Extraction 2. Instrumentation 3. Economics-Effects

SOV/137-59-1-474

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 1, p 60 (USSR)

AUTHOR: Chermak, L. L.

TITLE: Liquid Processing Converter Slags Containing Cobalt (Pererabotka konverternykh kobal'tsoderzhashchikh shlakov v zhidkom vide)

PERIODICAL: Byul. tsvetn. metallurgii, 1957, Nr 10, pp 26-30

ABSTRACT: A process for extraction of Co from converter slags (S) containing 0.35-0.5% Co was developed for conditions prevailing at the Yuzhuralnikel' Kombinat; the process is based on the principle of "impoverishment" (I) of the S's during their reaction with a liquid Ni matte in a horizontal converter having a basic lining and being equipped with an oil burner which provides additional heat. To agitate the liquid mass in order to accelerate the process of I, short air blasts are introduced through a portion of the tuyères. The waste S's contain 0.06-0.08% Co and up to 0.2% Ni. The Co content of the matte amounts to 0.5-0.7%; in the process of I it reaches a value of 1.5% (waste S's are produced at this state), and at the end of the process, when the richest S's are processed, it is raised to 2.5-4%. The last batches of the S are again treated with matte containing small

Card 1/2

SOV/137-59-1-474

Liquid Processing Converter Slags Containing Cobalt

quantities of Co. The total amount of Co extracted amounts to ~80%. By means of flowing in a converter the Co-enriched matte having a Ni-Co ratio of approximately 10 is segregated into Co-rich S's (1-2% Co and 2-3.5% Ni) and an intermediate nickel-sulfide product. The S's are again impoverished in a converter by means of causing them to react with a lean matte (0.4-0.6% Co, 7-10% Ni) obtained during smelting of sinter in a shaft furnace in conjunction with an increased consumption of pyrite. A secondary Co matte (4-6% Co, 16-30% Ni) and a S containing 0.2-0.5% Co and 0.2% Ni are obtained in the process and are returned to the stage of the primary I. The secondary Co matte is remelted in a shaft furnace together with the return S's recovered from its subsequent bessemerization and is then subjected to blowing which produces an anodic sulfide alloy containing 8% Fe. The S's from shaft-furnace smelting (~0.5% Co and ~0.2% Ni) are routed into an ore-smelting shaft furnace. The extraction of Co into anodic alloys from the initial S's increased from 28-30 to 60-62%.

Ye. Z.

Card 2/2

137-58-6-11980

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 113 (USSR)

AUTHORS: Lyumkis, S.Ye., Chermak, L.L., Kagan, A.S.

TITLE: Methods of Increasing the Activity of Powdered Nickel (Puti povysheniya aktivnosti nikelovogo poroshka)

PERIODICAL: Byul. tsvetn. metallurgii, 1957, Nr 16, pp 20-22

ABSTRACT: The conditions required to obtain active Ni powders are investigated. It is established that the size class of the initial oxide and the temperature at which it was heat treated are the dominant factors determining the degree of activity of the Ni powders. By means of X-ray analysis it was established that high-temperature processing increases the size of the crystallites grains of the nickelous oxide which, in turn, reduces the activity of the powder. In order to obtain a suboxide with grains of the required size (3-5 μ), it is essential that in the process of roasting of a metal sulfide product (obtained by bes-semerization of mattes) the temperature of the suboxide not be allowed to exceed 800-900°C. Results of laboratory investigations are utilized in the development of an industrial method for the production of active Ni powder. 1. Nickel powders--Properties
2. Nickel powders--Temperature factors 3. Nickel powders--X-ray analysis
4. Nickel powders--Production

N.P.

Card 1/1

CHERMAK, L.L.; DIYEV, N.P. [deceased]

Ways of improving methods of recovering cobalt from converter and
waste slags in the nickel industry. Trudy Inst. met. UFAN SSSR
no.2:169-180 '58. (MIRA 12:4)
(Nickel industry--By-products) (Cobalt--Metallurgy)
(Slag)

CHERMAK, L.L.; LYUMKIS, S.Ye.

Increasing the chemical activity of mattes. Biul. TSIIN tsvet. met.
no. 5:26-28 '58. (MIRA 11:7)

(Nonferrous metals--Metallurgy)
(Activity coefficients)

AUTHOR: Chermak, L.L.

SOV/136-58-9-7/21

TITLE: Metallization of Nickel Converter Mattes (Metallizatsiya nikel'evykh faynshteynov)

PERIODICAL: Tsvetnyye Metally, 1958, Nr 9, pp 37-39 (USSR)

ABSTRACT: Converter mattes formed in the treatment of nickel ores belong to the nickel-sulphur system. The author has measured the activities of nickel and sulphur in sulphide melts by determining the electromotive force using an amalgam-type cell. The cell body was made of high-quality fireclay, the electrodes were fused nickel sulphide, the electrolyte a fused mixture of nickel chloride and potassium chloride (or barium chloride for temperatures over 1000°C). The electrode liquids were contained in two depressions in the cell bottom into which graphite rods, insulated from the electrolyte by porcelain sheaths, dipped. Large negative deviation from ideal solutions were found. The author derives a quantitative relation between the matte sulphur content and the blowing temperature and suggests that the lowering of the

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Metallization of Nickel Converter Mattes SOV/136-58-9-7/21

finishing temperature to 1000 - 1050°C (with the addition of fluxes such as sodium salts or fluorides) is a good way of effecting the desirable increase in the converter-matte sulphur content.

There is 1 table

ASSOCIATION: Kombinat Yuzhuralnikel' (Yuzhuralnikel' combine)

Card 2/2 1. Nickel ores--Processing 2. Sulfides--Temperature factors
3. Slags--Electrical properties

CHERMAK, L.L., inzh.; LYUMKIS, S.Ye.

Ionic theory of slags and its practical application. Izv. vys.
uchab. zav.; Chern. met. no.12:41-43 D '58. (MIRA 12:3)

1. Kombinat Yuzhuralnikel'.
(Slag) (Ions) (Iron--Metallurgy)

CHERMAK, L. L., Candidate Tech Sci (diss) -- "On the problem of extracting cobalt from converter slags (Theory and practice of the process)". Sverdlovsk, 1959. 19 pp (Ural Affiliate of the Acad Sci USSR), 150 copies (KL, No 23, 1959, 169)

AUTHORS: Chermak, L.L., and Lyumkis, S. Ye. SOV/136-59-1-24/24
TITLE: Letters to the Editor (Pis'ma v redaktsiyu)
PERIODICAL: Tsvetnyye Metally, 1959, Nr 1, pp 102-103 (USSR)
ABSTRACT: The authors describe the successful application at the Yuzhuralnikel' Combine of a method (Refs 1 and 2) of treating liquid converter slags to recover cobalt. They complain that it has been neglected and note some disadvantages of another method (Ref 3) tested at the Severonikel' combine. They state that the Gipronikel' institute are misguided in seeking to extend the latter method and suggest that they have used incorrect and misleading data. The authors note possible methods of improving both processes. There are 4 references, all Soviet.

Card 1/1

AUTHORS: Lyumkis, S.Ye., Mimukhin, B.M. and ^{SOV/136-59-3-8/21}Chermak, L.L.

TITLE: On the Structure of Liquid Alloys of the Nickel-sulphur System (O stroynii zhidkikh splavov sistemy nikel'-sera)

PERIODICAL: Tsvetnyye Metally, 1959, Nr 3, pp 29 - 32 (USSR)

ABSTRACT: Previous work had shown that various sulphides were present in the intermediate sulphide product in the extraction of nickel. The present work is X-ray structural analysis of solid and liquid alloys of the nickel-sulphur system. The apparatus URS-70 was used and a diagram of this is given. The alloys investigated were the intermediate sulphide-nickel product and synthetic alloys containing 18% S (hypo-eutectic), 21.5% S (eutectic) and 24.9% S (Hyper-eutectic). The alloys were investigated at room temperature, 500 °C and 790-800 °C (50-100 °C above the melting point). The transition from solid to liquid is accompanied by a loss in intensity of the lines but only those lines with the smallest intensity disappear completely. In the alloys examined lines corresponding to Ni and Ni₃S₂ ^{only} were found. Micro-regions rich in Ni or Ni₃S₂ were found to exist. In general, the alloys consisted of solid

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SOV/136-59-3-8/21

On the Structure of Liquid Alloys of the Nickel-sulphur System

solutions of Ni and Ni_3S_2 and only in those alloys showing complete absence of molecular mixing (i.e. complete micro-inhomogeneity) were lines corresponding to both components of the alloy seen. The micro-inhomogeneity is connected with deviations from the ideal state. The properties of the alloys are in some degree the properties of the individual components, i.e. nickel and its sulphide. Therefore, there is a positive deviation. The line corresponding to the higher sulphide NiS was absent. NiS may, however, be present in complete molecular solution of Ni_3S_2 .

There are 1 figure and 12 Soviet references.

ASSOCIATION: Yuzhuralnikel' Combine

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18.3100

75388
SOV/149-2-5-14/32AUTHOR: Chermak, L. L.

TITLE: Certain Problems of Blowing Nickel Matte

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Tsvetnaya metallurgiya, 1959, Vol 2, Nr 5, pp 94-100 (USSR)

ABSTRACT: The distribution of cobalt and nickel between the converter mass and the slag when blowing nickel and copper-nickel matte can be expressed in first approximation according to the law of mass action as

$$\frac{(Me)_{slag} \sqrt{Fe}_{matte}}{\sqrt{Me}_{matte} (Fe)_{slag}} = K \quad (1)$$

The constant K for nickel is 6 to $8 \cdot 10^{-3}$, while for cobalt it is 8 to $10 \cdot 10^{-2}$. Thus, in accordance with equilibrium constants, cobalt is transferred from matte to slag much faster than nickel. Cobalt is subsequently refined from the slag. Another way is possible: concentration of

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Certain Problems of Blowing Nickel Matte

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cobalt in the matte until a final stage when it is transferred to a small volume of rich slag is practiced by Yuzhuralnikel (South Ural Nickel Combine). This is made possible by the adjustment of the iron content of the matte. If the total content of Fe and Ni in the matte is approximately 75% and the iron content in the slag is 45%, the distribution of Ni and Co among conversion products is established by the law of mass action and by the values $K_{Co} = 0.1$ and $K_{Ni} = 0.01$. Then, from the balance equations for nickel, cobalt, and iron, the following relations can be derived

$$S = \frac{168.35 (Fe' - Fe)}{Fe' - 75} \quad (3)$$

$$AND Co' = \frac{Co (75 - Fe') Fe'}{Fe' (1.01 Ni + 0.01 Fe - 7.56) + 6.8 Fe'} \quad (4)$$

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Certain Problems of Blowing Nickel Matte

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where S is the quantity of converter slag (kg) formed by 100 kg of charge; Co, Ni, and Fe represent their percentage in the charge before blowing; Co' and Fe' are their percentage at the moment of pouring the slag out. Supposing that slag is flowing out continuously as formed, the transfer of Ni and Co into the slag is expressed by the relation

$$(Me_{\text{kg}^2\text{slag}}) = \int_0^{\text{slag}} \frac{(Me)_{\text{slag}}}{100} d \quad (5)$$

which can be transformed by substitutions and integration into

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$$\begin{aligned}
 (\text{Ni}_{kg})_{\text{slag}} &= \int_{\text{Fe}}^{\text{Fe}'} \frac{K \text{Ni}' (\text{Fe})_{\text{slag}}}{100 \text{Fe}'} \frac{168.35 [(\text{Fe}' - 75) - (\text{Fe}' - \text{Fe})]}{(\text{Fe}' - 75)^2} d\text{Fe}' = \\
 &= -0.75 \text{Ni} \int_{\text{Fe}}^{\text{Fe}'} \frac{d\text{Fe}'}{\text{Fe}' (75 - \text{Fe}')} = 0.01 \text{Ni} \ln \frac{(75 - \text{Fe}') \text{Fe}}{(75 - \text{Fe}) \text{Fe}'} \quad (6)
 \end{aligned}$$

With the help of the above formula the author submits a calculation of Ni transfer into the slag, when the latter is continuously eliminated. This also permits the determination of the other elements in the converter mass and in the slag. If the slag is eliminated periodically, the number of eliminations raises very considerably the rate of metal transfer from slag to converter mass. It is at its maximum when slag elimination is continuous. To achieve this aim Diomidovskiy, D. A., and Shalygin, L. M., proposed to blow the matte using

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water-cooled nozzles situated at the head of the furnace. Matte is continuously poured through a port next to them, while slag flows out from the opposite side of the furnace by gravity. The transition of the extracted metal from slag to matte consists in atom and ion movements across the interface slag/matte. Jointly with Chernov, A. I., the author investigated this stage by tracing the metal movements with Co^{60} . A vertically divided crucible with two cylindrical compartments joined at the bottom was used for this purpose. Matte tagged with radioactive cobalt was introduced into the larger of these compartments, and it diffused into the smaller compartment, which acted as a semi-infinite rod. After the test, the crucible was rapidly cooled, and the solidified core was studied for its radioactivity. It was found that at $1,300^\circ$ the diffusion coefficient of cobalt in metallized matte is 1.5 to $2 \cdot 10^{-3} \text{ cm}^2/\text{sec}$, while in slag it is only 1 to $1.5 \cdot 10^{-4} \text{ cm}^2/\text{sec}$. This is the slowest part of the process. It can be speeded enormously ($2.5 \cdot 10^5$ times) if the bath is continuously stirred, as done at the Yuzhuralnikel plant. The article is recommended by the chair of heavy nonferrous metals of the

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Certain Problems of Blowing Nickel Matte

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SOV/149-2-5-14/32

Krasnoyarsk Nonferrous Metals Institute.

ASSOCIATION: Southern Ural Nickel Combine (Kombinat Yuzhural'nikel')

SUBMITTED: May 15, 1959

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CHERMAK, L.L.

PLATE 1 BOOK EXPLANATIONS 507/101

Konditsynsya oveshchitsya po prikladnyy khimii na metallurgicheskikh zavodakh SSSR. Sverdlovsk, 1956

Prikladnyy khimii na metallurgicheskikh predpriyatiyakh SSSR: materialy koordinatsionnogo sveshchaniya (Use of Oxygen in Metallurgical Plants of the USSR) Materials of the Coordination Conference. Sverdlovsk, 1960. 132 p. Kireta slip inserted. 1,000 copies printed.

Sponsoring Agency: Akademyn nauk SSSR. Topically titled. Institute metallurgii Sverdlovsk. [Sverdlovsk] Institute of Metallurgy.

Rep. No.: P.3. Kuznetsov, Candidate of Technical Sciences; Sverdlovsk. Sverdlovsk. [Sverdlovsk] Institute of Metallurgy.

Purpose: This collection of papers is intended for metallurgical research and technical personnel in the field of metallurgy.

Summary: The use of oxygen in ferrous and nonferrous metallurgy of the USSR is discussed. Results of the conference, held December 20 and 21, 1959, are presented. The following persons (in addition to the authors) took part in the conference: V.K. Kuznetsov, P.Ye. Sverdlov, A.A. Peregudov, (all affiliated with the Institute of Metallurgy of the USSR, Sverdlovsk), S.M. Kuznetsov (Kuznetsovskiy metallurgicheskii zavod, Sverdlovsk), Metallurgical Plant, N.Ye. Kochin (Dnepropetrovsk Metallurgical Plant), Metallurgical Plant, N.Ye. Kochin (Dnepropetrovsk Metallurgical Plant), S.T. Gerasimov (Dnepropetrovskiy zavod - Chalybnik Metallurgical Plant), S.T. Gerasimov (Dnepropetrovskiy zavod - Chalybnik Metallurgical Plant), V.A. Aglatov (Institute of Metallurgy - Dnepropetrovsk Institute), Sverdlovsk. Papers are followed by references, both Soviet and non-Soviet.

Kuznetsov, P.Ye. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in Open-Hearth Furnaces. 43

Dnepropetrovsk, P.Ye. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in Open-Hearth Furnaces. 47

Kuznetsov, P.Ye., and P.Ye. Kuznetsov. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in the Converter. 51

Kuznetsov, P.Ye. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in the Converter. 57

Kuznetsov, P.Ye. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in the Converter. 61

Kuznetsov, P.Ye. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in the Converter. 67

Kuznetsov, P.Ye. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in the Converter. 71

Kuznetsov, P.Ye. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in the Converter. 75

Kuznetsov, P.Ye. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in the Converter. 79

Kuznetsov, P.Ye. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in the Converter. 83

Kuznetsov, P.Ye. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in the Converter. 87

Kuznetsov, P.Ye. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in the Converter. 91

Kuznetsov, P.Ye. [Institute of Metallurgy of the USSR, Sverdlovsk]. Experimental Use of Oxygen in the Converter. 95

BOCHKAREV, L.M.; RAGULINA, A.T.; SERPOV, V.I.; CHERMAK, L.L.; SHERMAN,
B.P.

Pilot plant testing of the smelting of oxidized nickel ores
with a blow containing up to 45 percent oxygen. TSvet. met. 33
no.7:23-28 J1 '60. (MIRA 13:7)
(Nickel--Metallurgy) (Oxygen--Industrial applications)

CHERMAK, L.L.; BUROCHKIN, A.Ye.

Experimental smelting of oxidized nickel ores in an industrial
stack furnace (22.5 percent-oxygen content in the blow). TSvet.
met. 35 no.4:22-24 Ap '62. (MIRA 15:4)
(Nickel—Metallurgy)

YAKUBOV, V.I.; CHERMAK, L.L.; VANZHA, A.I.

Refractories made from the waste slag from nickel smelting. Tsement
29 no.1:19 Ja-F '63. (MIRA 16:2)

1. Ural'skiy filial Akademii stroitel'stva i arkhitektury i Yuzhno-
Ural'skiy nikel'evyy kombinat.
(Refractory materials) (Slag)

LYUMKIN S.Ye.; CHERMAK, L.L.; MIMUKHIN, B.M.; PHELPEKO, Kh.S.

X-ray analysis of liquid heavy metal sulfide alloys. Izv.vys.
ucheb.zav.; tsvet.met. 8 no.2:24-31 '66.

(MIRA 19:1)

1. Kombinat "Yuzhuralnikel". Submitted February 28, 1962.

S/089/60/009/006/003/011
B102/B212

26.2241

AUTHORS: Chermak, Y., Trlifay, L.

TITLE: Influence of a partly inserted absorbing rod on the distribution of the neutron-flux density

PERIODICAL: Atomnaya energiya, v. 9, no. 6, 1960, 470-476

TEXT: The authors have developed a method of calculating the effectiveness of a cylindrical absorbing rod partly inserted in a non-reflected reactor. This method makes it possible to estimate relatively easily the disturbance of the neutron-flux density, which appears near the rod. A cylindrical, homogeneous reactor of height H and radius R is considered here. In it, a control rod may be moved in a hole of radius a (see Fig.1); the insertion depth of the rod is h ($-H/2 \leq h \leq H/2$); the remainder of the hole is empty or filled with the material that is also in the reactor. The authors used the one-group approximation. The neutron-flux density $\varphi = \varphi(r, z)$ and the geometrical buckling B^2 are connected by the relation $\Delta\varphi + B^2\varphi = 0$. The neutron-flux density at the outer (extrapolated) boundary of the reactor is given by $\varphi(R, z) = \varphi(r, \pm H/2) = 0$ and that at

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Influence of a partly...

the inner one ($r=a$) is given by $\partial\varphi/\partial n = K\varphi$, where K denotes a linear operator characterizing the degree of filling of the hole (empty; filled with absorbing matter; filled with reactor material). The last-mentioned relation is given as follows if the extrapolated length λ is introduced: $\partial\varphi/\partial n = K\varphi = -\varphi/\lambda$. If the hole is filled with reactor material, it follows for $R \gg a$ that $K = \frac{1}{2} \left(\frac{2.405}{R} \right) a\varphi$; and if it is filled partly with

absorbing matter and partly empty, $K\varphi = \begin{cases} -\delta\varphi & \text{for } -H/2 \leq z \leq h \\ -\gamma\varphi & \text{for } h < z \leq H/2 \end{cases}$, where δ and

γ denote the reciprocal values of the extrapolated length for an empty hole and a hole filled with absorbing matter, respectively. The minimum eigenvalue of B^2 and the corresponding flux-density distribution $\varphi(r, z)$ are calculated by applying the above conditions. In the interval $-H/2 \leq z \leq H/2$, $\varphi(r, z)$ is expanded in a Fourier series

$$\varphi(r, z) = \sum_{k=1}^{\infty} \varphi_k(r) g_k(z), \text{ where } g_k(z) = \begin{cases} \cos a_k z & \text{for odd } k \\ \sin a_k z & \text{for even } k. (\alpha_k = k\pi/H) \end{cases}$$

Using $Z_k(r, B^2) = J_0(\sqrt{B^2 - \alpha_k^2} r) Y_0(\sqrt{B^2 - \alpha_k^2} R) - Y_0(\sqrt{B^2 - \alpha_k^2} r) J_0(\sqrt{B^2 - \alpha_k^2} R)$

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the cylindrical function Z_k is determined, and the authors set

$$\varphi_k(r) = \frac{Z_k(r, B^2)}{Z_k(a, B^2)}. \text{ Now, the condition } \partial\varphi/\partial n = K\varphi \text{ has to be satisfied.}$$

This is done by

$$-\frac{H}{2} \frac{Z'_k(a, B^2)}{Z_k(a, B^2)} \varphi_k = \sum_{l=1}^{\infty} K_{kl} \varphi_l \quad (k=1, 2, \dots), \quad (8)$$

$$Z'_k(a, B^2) = \frac{\partial}{\partial r} Z_k(r, B^2) \Big|_{r=a},$$

where K_{kl} denote the matrix elements of K . Thus, this problem is reduced to solving (8). The eigenvalue of B^2 and the corresponding eigenvector φ_k can be found. The following expression is obtained for the matrix elements K_{kl} :

$$-K_{kl} = \delta \int_{-\frac{H}{2}}^{\frac{h}{2}} dz g_k(z) g_l(z) + \frac{H}{2} \int_h dz g_k(z) g_l(z). \quad (9)$$

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$$\text{From the equations } Z_1'(a, B^2) = Z_1(a, B^2) \quad (h = -H/2) \quad (10)$$

$$\text{and } Z_1'(a, B^2) = -Z_1(a, B^2) \quad (h = H/2) \quad (11)$$

the minimum eigenvalue of B^2 is determined. (10) is valid for a completely inserted control rod and (11) for an empty hole. In both cases, the flux-density distribution is given by $Z_1(r, B^2) \cos \alpha_1 z$ up to a constant factor.

For practical calculations, one may set $\varphi_k = 0$ for $k > N$, and (8) may be substituted by the finite system of homogeneous equations

$$\frac{H}{2} \frac{Z_k'}{Z_k} \varphi_k = \sum_{l=1}^N K_{kl} \varphi_l \quad (k = 1, 2, \dots, N). \quad \text{The calculations are done for such a}$$

practical case. The following assumptions are made: $R = 215$ cm, $H = 415$ cm,

$a = 2.5$ cm, $\delta = 1.726 \cdot 10^{-4} \text{ cm}^{-1}$, $\gamma = 1.1629 \text{ cm}^{-1}$ for the following three insertion depths: $h = H/4$, $h = 0$, $h = -H/4$. The following results have

been obtained (non-reflected reactor): $B^2 = 0.1824 \cdot 10^{-3} \text{ cm}^{-2}$

($B_{\min}^2 \approx 0.1824 \cdot 10^{-3} \text{ cm}^{-2}$; $B_{\max}^2 \approx 0.2244 \cdot 10^{-3} \text{ cm}^{-2}$). The numerical values for

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φ_k at $h=0$ are shown in Table 1, those for $h = H/4$ in Table 2, and those for $H = -H/4$ in Table 3. The authors thank R. Zezul, Y. Svatosh, and M. Prazhkaya for the numerical calculations, which have partly been done on the electronic computer BESM (BESM) in the Vychislitel'nyy tsentr AN SSSR (Computer Center AS USSR). There are 6 figures, 3 tables, and 2 non-Soviet-bloc references.

ASSOCIATION: Institut yadernykh issledovaniy ChSAN, Praga (Institute of Nuclear Research of the Czechoslovakian AS, Prague)

SUBMITTED: March 4, 1960

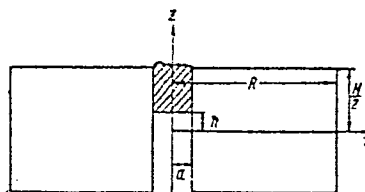


Fig. 1

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CHERMALYKH, A.M.

CHERMALYKH, A.M., inzh.

Mechanism for remote speed changes. Mashinostroitel' no.10:38-39
0 '57. (MIRA 10:11)

(Remote control) (Clutches (Machinery))

CHERMALYKH, G.N. [Chermalykh, H.N.]

Levinson's theorem in dispersion interpretation. Ukr. fiz.
zhur. 9 no.3:272-276 Mr '64. (MIRA 17:9)

1. Institut matematiki AN UkrSSR, Kiyev.