PROSKURYAKOV, V.A., dotsent, kand.tekhn.nauk

Fundamental expense method for technical and economic calculations of maintaining seam drifts. Ugol' 39 no.1:52-58 Ja '64.
(MIRA 17:3)

L 43090-65 EWT(m)/EPF(c)/T Pr-4 WE S/0081/65/000/001/P022/P022

ACCESSION NR: AR5006829

16
B

SOURCE: Ref. zh. Khimiya, Abs. 1P162

AUTHOR: Proskuryakov, V.A.; Rozental', D.A.; Vasil'yeva, G.M.

TITLE: The problem of the oxidative desulfuration of the rectified fractions of sulfurous petroleums. Desulfuration of the rectified fractions of sulfurous petroleums by oxidation in an autoclave

CITED SOURCE: Tr. Leningr. tekhnol. in-ta im. Lensoveta, vyp. 63, 1964, 168-172

TOPIC TAGS: petroleum refining, desulfuration, oxidative desulfuration, sulfurous crude, organic sulfur, sulfur oxidation

L 43090-65
ACCESSION NR: AR5006829

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an inhibitor of the oxidation of the hydrocarbons in the fraction; at the same time, the S compounds of the fraction are bound by alkali after being transformed into the active from of quadrivalent and hexavalent S. The oxidation of the sulfoorganic compounds can be accelerated by the use of the catalyst $CuCl_2 \cdot 2H_2O$. Preliminary experiments, carried out with the 240-270C kerosene fraction of Romashkino petroleum, showed that the degree of desulfuration is significantly increased by this process, even when the temperature is decreased to 120C, while the physicochemical constants before and after the experiment are identical. However, oxidation in a rotating autoclave proceeds at an excessively slow speed due to the small reactive surface and the poor dispersion of the petroleum fraction in the aqueous solution of alkali. A. Nagatkina

SUB CODE: FP ENCL: 00

Card 2/2

L 42106-65 EPF(c)/EWT(m)/EWP(b)/T/EWP(t) Pr-4 IJP(c) ME/JD/JG

ACCESSION NR: AT5008632 S/2933/64/007/000/0192/0195

23
22
B+1

AUTHORS: Proskuryakov, V. A.; Rozental', D. A.; Vasil'yeva, G. M.

TITLE: Desulfurization of petroleum and petroleum products by oxidation. 2. Desulfurization of benzene and kerosene fractions by atmospheric oxygen oxidation in an alkali medium

SOURCE: AN SSSR. Bashkirskiy filial. Khimiya seraorganicheskikh soyedineniy, soderzhashchikhsya v neftyakh i nefteproduktakh, v. 7, 1964, 192-195

TOPIC TAGS: desulfuration, petroleum, benzene, kerosene fraction, oxidation, catalyst, sodium hydroxide, alkali

ABSTRACT: Experiments were carried out to determine the optimum conditions for desulfurizing benzene and kerosene fractions from the Ural-Volga oil fields by

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L 42106-65
ACCESSION NR: AT5008632

conditions were: temperature 60C, air flow one liter/minute, NaOH concentration 3%, alkali to benzene ratio 1:2, pressure 10 atm, and test duration 10 minutes. The second specimen was of a 150-200C benzene fraction. The optimum conditions were: temperature 130C, air flow one liter/minute, alkali concentrate 3%, alkali-

conditions were found for the [illegible] tables.

ASSOCIATION: Leningradskiy tekhnologicheskiy institut im. Lensovata (Leningrad Technological Institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: IFP, GC

NO REF SOV: 000 OTHER: 003

Card 2/2 CC

L 49004-65 ENT(m)/EPF(c)/T Pr-4 DJ

ACCESSION NR: AR5007238 S/0081/65/000/002/P032/P032

23
B.

SOURCE: Ref. zh. Khimiya. Sv. t., Abs. 2P235

AUTHOR: Proskuryakov, V. A.; Mayakova, Ye. F.

TITLE: The synthesis of lubricating oil additives based on chlorinated polyterpenes

CITED SOURCE: Tr. Leningr. tekhnol. in-ta im. Lensoveta, vyp. 63, 1964, 192-195

TOPIC TAGS: oil additive, lubricating oil, polyterpene, chlorinated polyterpene, oil viscosity, oil solidification point, oil flash point, terpene chloride, thermal polymerization, catalytic polymerization, aluminum chloride, terpene polymer

TRANSLATION: One of the current trends in the use of the terpene chlorides is their use as chemically active additives to lubricating oils. In order to the authors studied the polymerization

L 49004-65
ACCESSION NR: AR5007238

liquid with a characteristic odor which is readily soluble in ether, acetone, benzene and toluene. A study of the catalytic polymerization reactions of the by-product showed that the best indices were achieved by using $AlCl_3$ as a catalyst in the amount of 10% of the weight of the raw material. The reaction was carried out in toluene solution at a temperature of 98-100C for 30 minutes. The product of polymerization with $AlCl_3$ (additive II) (viscosity 52 centistokes at 100C, soli-

SUB CODE: PP, OC EXCL: 00
Card 2/2

PROSKURYAKOV, V. A. Cand. Tech. Sci.

Dissertation: "Calculation of Ground Pressure in Connection with Controlling a Hanging Layer in Coal Mines of the Moscow Basin." Moscow Mining Inst imeni I. V. Stalin, 23 Jan 47.

SO: Vechernyaya Moskva, Jan, 1947 (Project #17836)

PROSKURYAKOV, V. Aleksandrovich

25(1) PHASE I BOOK EXPLOITATION SOV/1933

Nikiforov, Vikentiy Markianovich, Georgiy Ivanovich Pogodin-Alekseyev, Doctor of Technical Sciences, Professor, Vasiliy Alekseyevich Proskuryakov, Vladimir Aleksandrovich Proskuryakov, and Konstantin Ivanovich Tkachev

Tekhnologiya vazhneyshikh otrasley promyshlennosti. Ch. I: Metallurgiya i metallovedeniye; uchebnoye posobiye dlya vysshikh partiynykh shkol (Technology of the Most Important Industries. Pt. 1: Metallurgy and the Science of Metals; a Textbook for Higher Party Schools) Moscow, Izd-vo VPSh i AON pri TsK KPSS, 1959. 271 p. Errata slip inserted. 25,000 copies printed.

Sponsoring Agency: Kommunisticheskaya partiya Sovetskogo Soyuza. Tsentral'nyi komitet. Vysshaya partiynaya shkola. Kafedra promyshlennogo proizvodstva i stroitel'stva.

Ed. (Title page): G. I. Pogodina-Alekseyeva, Doctor of Technical Sciences, Professor; Eds. (Inside book): S. Ya. Golovin, and D. O. Slavin; Tech. Ed.: K. M. Naumov.

Card 1/7

PURPOSE: This book is intended to serve as a manual in higher Party schools, and may also be used by general readers interested in widening their knowledge of the given branch of industry.

COVERAGE: This manual was written in accordance with the curriculum of the four-year course entitled "Technology of the Most Important Branches of Industry" given at higher Party schools. The book is divided into two parts: "Metallurgy and Mining of Raw Materials and Fuels" and "Physical Metallurgy and Heat Treatment of Metals." The authors present the fundamentals of the mining and exploitation of the basic raw materials and fuels and the basic principles of metallurgy. There are numerous diagrams and illustrations explaining the basic underground and open pit mining methods. Cross-sections of oil wells show the principles of oil production. The authors trace the flow in the metallurgical industry from the smelting of ores to the final heat treatment of the metals. Special features in producing nonferrous metals and the most commonly used alloys are explained. Problems of corrosion and corrosion prevention are discussed. In the introduction the authors give a brief outline of the new Seven-Year Plan 1959-1965, mentioning the production targets in metallurgy for those years and the new establishments under construction. No references are listed.

TABLE OF CONTENTS:

AVAILABLE: Library of Congress

BELOKON', V.A.; PEVNITSKIY, A.I., [illegible] V.I.

Entrance of a strong shock wave into a [illegible]
Zhur. eksp. i teor. fiz. 48 no.1:50-60 Ja '65. (MIRA 18:4)

1. Institut fiziki zemli AN SSSR.

PROSKURYAKOV, Vlad. Aleksandrovich

25(1) PHASE I BOOK EXPLOITATION SOV/1933

Nikiforov, Vikentiy Markianovich, Georgiy Ivanovich Pogodin-Alekseyev, Doctor of Technical Sciences, Professor, Vasiliy Alekseyevich Proskuryakov, Vladimir Aleksandrovich Proskuryakov, and Konstantin Ivanovich Tkachev

Tekhnologiya vazhneyshikh otrasley promyshlennosti. Ch. I: Metallurgiya i metallovedeniye; uchebnoye posobiye dlya vysshikh partiynykh shkol (Technology of the Most Important Industries. Pt. 1: Metallurgy and the Science of Metals; a Textbook for Higher Party Schools) Moscow, Izd-vo VPSh i AON pri TsK KPSS, 1959. 271 p. Errata slip inserted. 25,000 copies printed.

Sponsoring Agency: Kommunisticheskaya partiya Sovetskogo Soyuza. Tsentral'nyi komitet. Vysshaya partiynaya shkola. Kafedra promyshlennogo proizvodstva i stroitel'stva.

Ed. (Title page): G. I. Pogodina-Alekseyeva, Doctor of Technical Sciences, Professor; Eds. (Inside book): S. Ya. Golovin, and D. O. Slavin; Tech. Ed.: K. M. Naumov.

Card 1/7

Technology of the Most Important (Cont.) SOV/1933

PURPOSE: This book is intended to serve as a manual in higher Party schools, and may also be used by general readers interested in widening their knowledge of the given branch of industry.

COVERAGE: This manual was written in accordance with the curriculum of the four-year course entitled "Technology of the Most Important Branches of Industry" given at higher Party schools. The book is divided into two parts: "Metallurgy and Mining of Raw Materials and Fuels" and "Physical Metallurgy and Heat Treatment of Metals." The authors present the fundamentals of the mining and exploitation of the basic raw materials and fuels and the basic principles of metallurgy. There are numerous diagrams and illustrations explaining the basic underground and open pit mining methods. Cross-sections of oil wells show the principles of oil production. The authors trace the flow in the metallurgical industry from the smelting of ores to the final heat treatment of the metals. Special features in producing nonferrous metals and the most commonly used alloys are explained. Problems of corrosion and corrosion prevention are discussed. In the introduction the authors give a brief outline of the new Seven-Year Plan 1959-1965, mentioning the production targets in metallurgy for those years and the new establishments under construction. No references are listed.

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TABLE OF CONTENTS:

Technology of the Most Important (Cont.) SOV/1933

AVAILABLE: Library of Congress

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Card 7/7

PROSKURYAKOV, V. A.

FA 24T49

USSR/Engineering — Sep 1947
Mines and Mining
Mathematics - Applied

"Empirical Calculation of Lava Pressure in Mines of the Moscow Basin," V. A. Proskuryakov, Candidate in Technical Sciences, 6½ pp

"Ugol'" No 9 (258)

Discusses with mathematical formulae the load on the braces in lava deposits, the distribution of the pressure in mines and effective methods of bracing mine tunnels and shafts. Presents a table showing the various mathematical formulae for the calculation of the amount of pressure exerted on the timber supports and walls in lava in tons per meter. Diagrams of various timber support constructions and methods for calculating the various stresses on these supports under different conditions.

24T49

PA 61T78

USSR/Mines and Mining
Mining Equipment
Braces - Strength

Feb 1948

"Computations of the Thickness of Supports in Lava Shafts of the Sub-Moscow Basin," Engr V. A. Proskuryakov, Candidate Tech Sci, 3 pp

"Ugol'" No 2 (263)

Thickness of supports varies according to density of veins and size of working area. Thickness can be decreased if size of working area is not large, and if vein is worked by method of cutting cells and chambers.

61T78

PROSKURYAKOV, V.A.; REMBASHEVSKIY, A.G.; SOLOVEYCHIK, Z.V.

Flotation cleaning of Volga shales. Report No.1: Flotation cleaning of Obshchiy Syrt shales. Trudy VNIIT no.10:5-22 '61. (MIRA 15:3)
(Obshchiy Syrt—Shale)(Flotation)

PROSKURYAKOV, V.A.; SOLOVEYCHIK, Z.V.; Prinimali uchastiye: TROSTYANSKAYA, A.G.; KUPRIYANCHIK, A.D.

Oxidation of oil shales by atmospheric oxygen. Report No.2: Oxidation of Gdov shales in continuous air feed. Trudy VNIIT no.10:81-90 '61. (MIRA 15:3)

(Gdov--Oil shales)(Oxidation)

L 26058-65 EWT(1)/EWP(m)/FCS(k)/EWA(h) Pd-1/Pi-4

ACCESSION NR: AP5004372 S/0056/65/048/001/0050/0060

37
14
B

AUTHOR: Belokon', V. A.; Petrukhin, A. I.; Proskuryakov, V. A.

TITLE: Entrance of a strong shock wave into a wedge-shape cavity

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 1, 1965, 50-60

TOPIC TAGS: shock wave propagation, shock wave reflection, high temperature plasma, shock tube, shock wave, high pressure

ABSTRACT: The authors investigated some features of multiple Mach reflections of converging strong shock waves produced by an electric spark discharge in a shock tube made of iron with an approximate inside diameter of 110 mm. The energy stored was about 8000 J, with approximately 3000 J released in the gap (80% of which was released in 8.5 μsec. The tube consisted of

...shaped cavity with an angle of 40° at the vertex.

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The total distance from the discharge gap to the vertex of the wedge cavity was 1300 mm. The tube was filled with atmospheric air. The initial pressure prior to the explosion was measured with a McCleod gauge. After each explosion, the tube was refilled with air and pumped out to one of the three initial pressures: 0.1, 0.2, and 0.5 mm Hg. The shock-wave front velocity was measured with an SFR camera with a mirror speed of 60,000 rpm. The passage of the shock wave in the wedge region was photographed at 2×10^6 frames per second by the SFR camera used as a time magnifier. The visible region of the shock wave spectrum was photographed with an ISP-51 spectrophotograph. The results have shown that the multiple irregular (Mach) reflections of a strong shock wave entering the wedge-shape cavity increase noticeably the plasma temperature, increase the mass density by more than 100 times, and increase the glow brightness by more than 1,000 times compared with the plasma characteristics behind the shock wave. At the vertex of the wedge-shape cavity plasma is produced which radiates like a grey body with a brightness temperature 35×10^3 K. The electron density in the wedge-shape cavity is almost ten times larger than in normal reflection from a flat wall (under the same initial shock-wave parameters), and the brightness of the glow increases by approximately 50 times. This can be used to produce a high-

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intensity light source. "We thank Professor G. I. Pokrovskiy for suggesting the idea of the experiment, and also K. Ye. Gubkin, Professor K. Moravets, and I. V. Nemchinov for valuable discussions and Z. N. Stepchenkov for calculations." Orig. art. has: 6 figures, 3 formulas, and 8 tables. [02]

ASSOCIATION: Institut fiziaki zemli Akademii nauk SSSR (Institute of Physics of the Earth, Academy of Sciences, SSSR)

SUBMITTED: 15Jun64 ENCL: 00 SUB CODE: ME

NO REF SOV: 007 OTHER: 008 ATD PRESS: 3186

Card 3/3

PROSKURYAKOV, V. B., Cand Tech Sci -- (diss) "Calculation of flat, curved beams of variable height." Leningrad, 1960. 16 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Leningrad Polytechnic Inst im M. I. Kalinin); 250 copies; price not given; bibliography at end of text (10 entries); (KL, 27-60, 154)

PROSKURYAKOV, Vladimir Borisovich; GRISHKAN, I.A., red.; SOBOLEVA, Ye.M., tekhn. red.

[Using the method of photoelasticity in solving engineering problems]Ispol'zovanie metoda fotouprugosti pri reshenii inzhenernykh zadach. Moskva, Gosenergoizdat, 1962. 47 p. (MIRA 15:10)

(Photoelasticity) (Stains and stresses)

MONAKHENKO, D.V.; PROSKURYAKOV, V.B. (Leningrad)

Modeling the stressed state of frames made of thin rods of wrinkled profile. Stroi.mekh. i rasch.soor. 6 no.3:3-6 '64. (MIRA 18:1)

24(6), 25(2) SOV/179-59-4-35/40

AUTHOR: Proskuryakov, V. B. (Leningrad)

TITLE: Determining the Stresses at the Tooth Root

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye tekhnicheskikh nauk. Mekhanika i mashinostroyeniye, 1959, Nr 4, pp 183 - 184 (USSR)

ABSTRACT: It is attempted to determine the stresses at the tooth root by methods of the elasticity theory. The state of stress in a tooth of a straight-geared wheel can be expressed by equations of the plane elasticity theory. The solution was obtained here in a bipolar coordinate system by means of a conformal transformation. An infinite plane limited inside by certain lines is investigated. The problem is solved under the 7 boundary conditions pointed out here, and by use of the function F of the stresses. On the basis of the relations in the paper (Ref 2), the stress components are found. The constants are determined according to the 7 boundary conditions, whereupon a system of equations is obtained. The stresses σ_β and $\tau_{\alpha\beta}$ at the boundary $\beta = -\pi$, which are determined on the basis of the

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relations obtained (by solving the equation system) , are in satisfactory agreement with the experimental data. See the figure. Therefore, the solution put forward here can be used for determining the stresses at the tooth root. . There are 1 figure and 3 Soviet references.

SUBMITTED: March 23, 1959

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S/179/60/000/006/030/036
E081/E135

AUTHORS: Monakhenko, D.V., and Proskuryakov, V.B. (Leningrad)

TITLE: Modelling the Stress State in Thin Sloping Shells

PERIODICAL: Izvestiya Akademii nauk SSSR,Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1960, No. 6, pp. 161-163

TEXT: Thin inclined shells and plates are basic elements in a number of aircraft, ship and other constructions. In many cases these elements work with large deflections, and the stress state is governed by non-linear equations which complicate the solution of practical problems. In experimental investigations on models the parameters of the model which make the model and natural stress systems similar require to be known. When modelling thin shells and plates, the fulfilment of the requirements of geometric similarity are practically impossible since they lead to very small thicknesses in the models; moreover the investigations are usually conducted on materials with Poisson's ratios differing from those in nature (organic glass, bakelite, epoxy resins, etc). The present paper describes a method of modelling thin sloping

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Modelling the Stress State in Thin Sloping Shells

shells assuming geometrical affinity, and in some cases a difference between the Poisson's ratios in the model and in nature. In the usual notation the equations of a thin shell with large deflections are written as:

$$\frac{D}{h}\nabla^2\nabla^2 w = \frac{\partial^2 w}{\partial x^2}\frac{\partial^2 \Phi}{\partial y^2} + \frac{\partial^2 w}{\partial y^2}\frac{\partial^2 \Phi}{\partial x^2} - 2\frac{\partial^2 w}{\partial x \partial y}\frac{\partial^2 \Phi}{\partial x \partial y} + k_x\frac{\partial^2 \Phi}{\partial y^2} + k_y\frac{\partial^2 \Phi}{\partial x^2} + \frac{q}{h} \quad (1.1) \qquad (1.1)$$

$$\frac{1}{E}\nabla^2\nabla^2 \Phi = \left(\frac{\partial^2 w}{\partial x \partial y}\right)^2 - \frac{\partial^2 w}{\partial x^2}\frac{\partial^2 w}{\partial y^2} - k_x\frac{\partial^2 w}{\partial y^2} - k_y\frac{\partial^2 w}{\partial x^2}$$

and the conditions of similarity for the stress function and the deflection are then found as:

$$\frac{c_p c_\ell^2}{c_\Phi c_h c_w} = 1, \quad \frac{c_\nu c_\Phi}{c_E c_h^2} = 1, \quad \frac{c_w}{c_k c_\ell^2} = 1, \quad \frac{c_\Phi}{c_E c_w^2} = 1 \qquad (1.2)$$

where $c_x = c_y = c_\ell$, $c_{kx} = c_{ky} = c_k$, $c_\nu = (1 - \mu_H^2/1 - \mu_M^2)$

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Modelling the Stress State in Thin Sloping Shells

and the boundary conditions lead to the further condition

$$c_{\mu} = 1. \qquad (1.3)$$

It is known that the stress (II) and strain (T) tensors for a shell can be written as the sum of a chain and a bending tensor as:

$$\Pi = \Pi_{ц} + \Pi_{и} = \begin{vmatrix} \frac{\partial^2\Phi}{\partial y^2} & -\frac{\partial^2\Phi}{\partial x\partial y} \\ \bullet & \frac{\partial^2\Phi}{\partial x^2} \end{vmatrix} + \begin{vmatrix} -\frac{Ez}{1-\mu^2}\left(\frac{\partial^2 w}{\partial x^2}+\mu\frac{\partial^2 w}{\partial y^2}\right) & -\frac{Ez}{1+\mu}\frac{\partial^2 w}{\partial x\partial y} \\ \bullet & -\frac{Ez}{1-\mu^2}\left(\frac{\partial^2 w}{\partial y^2}+\mu\frac{\partial^2 w}{\partial x^2}\right) \end{vmatrix} \qquad (2.1)$$

(2.1)

$$T = T_{ц} + T_{и} = \begin{vmatrix} \frac{1}{E}\left(\frac{\partial^2\Phi}{\partial y^2}-\mu\frac{\partial^2\Phi}{\partial x^2}\right) & -\frac{1+\mu}{E}\frac{\partial^2\Phi}{\partial x\partial y} \\ \bullet & \frac{1}{E}\left(\frac{\partial^2\Phi}{\partial x^2}-\mu\frac{\partial^2\Phi}{\partial y^2}\right) \end{vmatrix} + \begin{vmatrix} -z\frac{\partial^2 w}{\partial x^2} & -z\frac{\partial^2 w}{\partial x\partial y} \\ \bullet & -z\frac{\partial^2 w}{\partial y^2} \end{vmatrix} \qquad (2.2)$$

(2.2)

From these equations the similarity conditions for the stress and strain tensors are given by Eqs.(2.3), (2.4), and (2.5) for the

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Modelling the Stress State in Thin Sloping Shells

complete tensors, the chain tensors and the bending tensors respectively:

$$c_\mu = 1, \quad \frac{c_\Phi}{c_E c_h c_w} = 1, \quad \frac{c_h c_w}{c_l^2 c_\varepsilon} = 1 \quad \left(\text{для полных деформаций}\right) \tag{2.3}$$

$$c_\mu = 1, \quad \frac{c_\Phi}{c_E c_h c_w} = 1 \quad \frac{c_E c_h c_w}{c_l^2 c_\sigma} = 1 \quad \left(\text{для полных напряжений}\right) \tag{2.3}$$

$$c_\mu = 1, \quad \frac{c_\Phi}{c_E c_l^2 c_{\varepsilon ц}} = 1, \quad \left(\text{для цепных деформаций}\right), \quad \frac{c_\Phi}{c_l^2 c_{\sigma ц}} = 1 \quad \left(\text{для цепных напряжений}\right) \tag{2.4}$$

$$\frac{c_h c_w}{c_l^2 c_{\varepsilon и}} = 1 \quad \left(\text{для изгибных деформаций}\right), \quad c_\mu = 1, \quad \frac{c_E c_h c_w}{c_l^2 c_{\sigma и}} = 1 \quad \left(\text{для изгибных напряжений}\right) \tag{2.5}$$

The equations

$$\sigma_H \leqslant \sigma_{H.lim} \tag{3.1}$$

and

$$\sigma_M \leqslant \sigma_{M.lim} \tag{3.2}$$

express the conditions that the stresses (strains) in nature and in the model respectively do not exceed the proportional limits of the material, and (3.2) is found to be satisfied if the inequality

Modelling the Stress State in Thin Sloping Shells

$$\frac{c_{\sigma\,\lim}}{c_\sigma} \leqslant 1 \qquad (3.3)$$

holds. From Eqs.(1.2), (1.3), (2.3) and (3.3) the conditions of similarity for the complete stress (strain) tensors are given by:

$$\frac{c_{\omega}}{c_h}=1, \quad \frac{c_h}{c_k c_l^2}=1, \quad c_p=1, \quad \frac{c_p c_l^2}{c_\Phi c_h^2}=1$$
$$\frac{c_\Phi}{c_E c_h^2}=1, \quad \frac{c_\Phi}{c_l^2 c_\sigma}=1, \quad \frac{c_\sigma}{c_E c_\varepsilon}=1, \quad \frac{c_{\sigma\,\lim}}{c_\sigma}<1 \qquad (4.1)$$

(4.1)

where c_p is the coefficient of similarity of the external loading. This system consists of 7 equations and 1 inequality connecting 11 similarity coefficients, and three coefficients are therefore arbitrary. Assuming similarity between bending strains and chain stresses, we obtain:

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Modelling the Stress State in Thin Sloping Shells

$$\frac{c_v^{1/3}c_w}{c_h}=1,\quad \frac{c_h}{c_v^{1/3}c_k c_l^{2/3}}=1,\quad \frac{c_v^{1/3}c_p c_l^2}{c_\Phi c_h^2}=1$$
$$\frac{c_v c_\Phi}{c_E c_h^2}=1,\quad \frac{c_\Phi^{1/2}}{c_l^2 c_{\sigma\text{II}}}=1,\quad \frac{c_h c_w}{c_l^2 c_{\varepsilon\text{II}}}=1 \qquad (5.1)$$

(5.1)

consisting of 6 equations connecting 10 coefficients, 4 of which are therefore arbitrary. This similarity is such that the Poisson's ratios of the model and the natural material may be different, and the requirement of geometric similarity is absent. If the deflections of the shell are small,

$$w \leqslant \alpha h \qquad (\alpha = 1/5 \div 1/2) \qquad (6.1)$$

the similarity indices (1.2) can be replaced by those obtained on linearising Eqs.(1.1). The limiting condition

$$c_h/c_w \leqslant 1 \qquad (6.2)$$

guaranteeing fulfilment of (6.1) must be obeyed.

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Modelling the Stress State in Thin Sloping Shells

If in Eqs.(1.1) $k_x = k_y = 0$, the similarity conditions for plates are obtained as a special case.

There are 4 Soviet references.

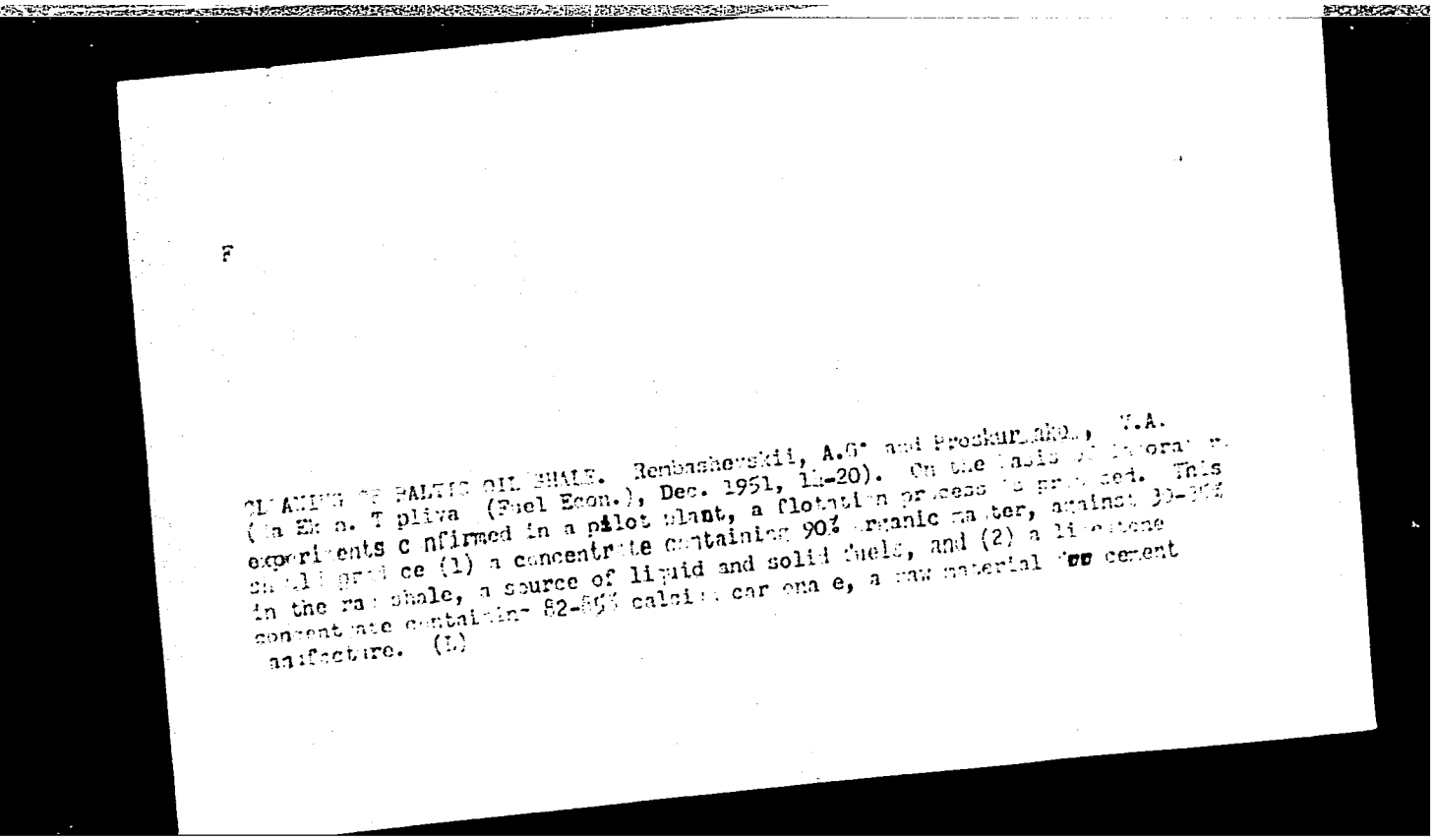
SUBMITTED: September 5, 1960

Card 7/7

PROSKURYAKOV, V.B. (Leningrad)

Determining stresses in gear tooth roots. Izv.AN SSSR.Otd.tekh. nauk. Mekh. i mashinostr. no.4:183-184 Jl-Ag '59.
(MIRA 12:8)

(Gearing)



F

CLEANING OF BALTIC OIL SHALE. Rembashevskii, A.G. and Proskuryakova, V.A. (In Engn. Typliva (Fuel Econ.), Dec. 1951, 14-20). On the basis of laboratory experiments confirmed in a pilot plant, a flotation process is proposed. This enables production (1) a concentrate containing 90% organic matter, against 30-35% in the raw shale, a source of liquid and solid fuels, and (2) a limestone concentrate containing 82-85% calcium carbonate, a raw material for cement manufacture. (L)

GRINSHTEYN, Mark Mikhaylovich; PROSKURYAKOV, V.I., red.; SHIROKOVA, M.M., tekhn. red.

[Photoresistances and their use in automatic industrial control devices]Fotosoprotivleniia v priborakh promyshlennoi avtomatiki. Moskva, Gosenergoizdat, 1962. 78 p. (Biblioteka po avtomatik no.49) (MIRA 15:10)
(Automatic control) (Photoelectric cells)

LITVAK, Viktor Izrailevich; PROSKURYAKOV, V.I., red.; VORONIN, K.R., tekhn. red.

[Photorelays in control and automatic systems] Fotorele v sistemakh avtomaticheskogo kontrolia i regulirovaniia. Moskva, Gos. energ. izd-vo, 1961. 110 p. (MIRA 14:10)
(Photoelectric cells) (Automatic control)

PROSKURYAKOV, V. K.

PROSKURYAKOV, V. K.: "Material on the cytological analysis of punctates in the clinical treatment of gynecological disdases." Tomsk State Medical Inst imeni V. M. Molotov. Tomsk, 1956. (Dissertation for the Degree of Candidate in Medical Sciences.)

Source: Knizhnaya letopis' No 40 1956 Moscow

PROSKURYAKOV, Ye.K., inzh.

SVBK-150 boring machine. Mekh. trud. rab. 12 no.8:12 Ag '58.
(MIRA 11:9)

(Drilling and boring machinery)

PROSKURYAKOVA, Ye., nauchnyy sotrudnik

Interprovince conference on research and practice of ophthalmologists of Nikolayev, Kherson, and Crimea Provinces. Oft.zhur. 14 no.8:502-506 '59. (MIRA 13:4)

(OPHTHALMOLOGY)

POKROVSKIY, V., inzh.; PROSKURYAKOV, Ye., inzh.

Hydraulic mechanization in open pit mines. Sov.shakht. 10 no.12:12 D '61. (MIRA 14:12)
(Chelyabinsk Basin--Hydraulic mining)

KONDRATENKO, V.P.; PROSKURYAKOV, Ye.I.

Korkino open-cut mines are enterprises of communist labor. Ugol' 36 no.6:8-11 Je '61. (MIRA 14:7)

1. Nachal'nik kombinata Chelyabinskugol' (for Kondratenko).
2. Nachal'nik rayona kombinata Chelyabinskugol' (for Proskuryakov).

(Chelyabinsk Basin--Strip mining--Labor productivity)

AUTHOR: Proskuryakov, Ye.K., Engineer SOV-118-58-8-5/24

TITLE: The "SVBK-150" Drilling Rig (Burovoy stanok SVBK-150)

PERIODICAL: Mekhanizatsiya trudoyëmkikh i tyazhëlykh rabot, 1958, Nr 8, p 12 (USSR)

ABSTRACT: An experimental self-propelling drilling rig,"SVBK-150" was built for drilling bore holes on the Korkino strip coal mine. With a maximum depth of 25 m, 80-100 m of drill holes with diameters of 150 mm can be drilled in 1 shift. This rig belongs to the rotatory drilling rig type. It has a cutter and can clean the holes with compressed air. In order to eliminate its defects, the "SVBK-200" drilling rig was built. There is 1 photo.

1. Drilling machines--Design 2. Mines--Equipment 3. Coal--USSR

Card 1/1

25(5)

AUTHORS: Gordon, M. M., Engineer, Proskuryakov, Ye. T., Engineer, Shapiro, V. V., Engineer SOV/119-59-9-12/19

TITLE: The Measurement of the Consumption of Bituminous Coal Tar by Means of a Pulse Ultrasonic Consumption Indicator

PERIODICAL: Priborostroyeniye, 1959, Nr 9, pp 24-25 (USSR)

ABSTRACT: The first figure shows a schematic section of the primary element of the tar consumption indicator. This primary element is fitted into the tar conveyer tube in such a manner that the whole tar to be measured flows through the channel of the primary element. 4 piezo elements (quartz crystals) are attached to the front orifice of the channels. Two of them transmit ultrasonic pulses and the other two receive these pulses. The construction of the primary element is discussed then. Both channels are bored into a metal rod, which warrants good heat exchange between the channels. The block diagram of the electronic part of the apparatus is also given in the first figure. Thereafter the operating mode of the apparatus is discussed. The ultrasonic pulse is recorded by a quartz and converted into an electric pulse. The electric pulse is then amplified , synchronizes a

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blocking generator, which emits a strong pulse voltage. These blocking generators are described in brief. The unit of the tar volume (a certain difference d_f between two frequencies) does on principle not depend on the velocity of sound. Thus the unit has no relation whatever to the physical properties of the fluid, especially not to its temperature. Actually a certain dependence on the physical properties of the fluid remains. A diagram illustrates the computed displacement curves of the zero point of the apparatus as a function of the temperature of the fluid for varying distances between the quartzes of each pair. The error caused by differences in temperature may be neglected, if the error in arrangement of the quartzes does not exceed 0.1 mm. In the apparatus described here the two quartz pairs are mounted in different channels. A further figure gives the diagram of an instrument for indicating the tar consumption during ignition of the flares of a gas heated open-hearth furnace. In the next figure the photograph of a drop of anthracene oil taken under a microscope is shown. Evidently anthracene oil is not a homogeneous fluid, since it contains solid particles and

inclusions of liquid. The primary element of the apparatus must be mounted in the heated container so as to prevent a temperature drop below 50° C during periods of low consumption. The apparatus (precision degree 2) has a linear scale for the reading range 100 - 1000 kg/h can but also be produced with a smaller scale range. There are 6 figures and 3 references, 2 of which are Soviet.

PROSKURYAKOV, Yu.G., kand.tekhn.nauk, dotsent; MEN'SHAKOV, V.M., inzh.

Selecting operating conditions for burnishing parts with balls or rolls. Vest.mashinostr. 42 no.11:60-63 N '62. (MIRA 15:11)
(Metals--Finishing)

SOV/123-59-16-64424

Translation from: Referativnyy zhurnal. Mashinostroyeniye, 1959, Nr 16, p 111 (USSR)

AUTHORS: Proskuryakov, Yu.G., Davidyuk, V.I.

TITLE: Worm Milling Cutter for Finishing High-Speed Gear Cutting

PERIODICAL: Sb. statey. Chelyab. politekhn. in-t, 1958, vyp 9,5-11

ABSTRACT: The design of a worm milling cutter with inserted chasers fitted with soldered-on hard alloy plates of the T5K10 grade, for finishing high-speed milling is described. The chasers are wedged in grooves and fastened by bolts in axial direction. The chasers are correctly fitted in axial direction by an adjustment ring with props, which is fastened to the body. The geometry of the chasers: the rear angle for the lateral cutting edges - 12°, the front facet is chamfered at an angle of 5°; the width of the chamfer for peripheral cutting edge - 0.8 mm, on the sides the chamfer gradually decreases from 0.8 to 0.2 mm at the root of the tooth; by this the stability of the edges is warranted. The cutter was tested by a flywheel of 400 mm in diameter and 50 kg weight fastened to the spindle. A gear (m = 9, z = 27) of 20KhNZA steel was machined which, for the finishing, had a tolerance of 1.08 - 1.35 mm. Cutting conditions: V = 134 m/minute; s = 1.7 and 2.5 mm/revolution. The basic parameters of

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Worm Milling Cutter for Finishing High-Speed Gear Cutting SOV/123-59-16-64424

the cutter are given as well as the allowance for its manufacture, the drawings of the body, of the assembled milling cutter, of the hard alloy knife, of the reamer of the adjusting ring and the scheme of distribution of tolerance, and the drawing of the blank. 3 references.

B.E.P.

Card 2/2

PROSKURYAKOV, Yu.G.; MEN'SHAKOV, V.M.

Relationship between the microgeometry of machined surface and shaping conditions. Trudy Sem.po kach.poverkh. no.5:366-374 '61. (MIRA 15:10)

(Metalwork)

PROSKURYAKOV, Yu.G., kand.tekhn.nauk, dotsent; KULIKOVSKIKH, V.A., inzh.

Surface finishing with wire brushes. Vest.mashinostr. 43 no.2:56-59 F '63. (MIRA 16:3)
(Metals—Finishing)

PROSKURYAKOV, Yu.G., kand. tekhn. nauk, dotsent; POLIKYAKOV, I.V., inzh.

Wear resistance of burnished hole surfaces. Izv. vys. ucheb. zav.; mashinostr. no.11:168-176 '63.

(MIRA 17:10)

1. Chelyabinskiy politekhnicheskiy institut.

L 63198-65 EWP(k)/EWA(c)/EWT(m)/EWP(b)/T/EWP(v)/EWP(t) JD/HM

ACCESSION NR: AP5018458 UR/0117/65/000/007/0020/0020 27 24 B

621.919-473

AUTHORS: Proskuryakov, Yu. G. (Doctor of technical sciences); Savishchenko, V. M. 44,55

TITLE: A broach for finishing the inner surface of welded pipes 15 A

SOURCE: Mashinostroitel', no. 7, 1965, 20

TOPIC TAGS: metal working, metal removal, broach

ABSTRACT: A tool is described for removal of the burr produced by electrical resistance welding on the inner surface of pipes. It consists of two major parts. Part 1 (shown on Fig's. 1 and 2 on the Enclosure) is equipped with a series of cutters 13 and with guiding elements 10 and 11. Part 2 maintains a pressure

L 63198-65
ACCESSION NR: AP5018458

coefficient of friction between Part 1 and Part 2; f_2 - coefficient of friction between Part 2 and the pipe; δ (delta)- wedge angle 10° - 15°; k - safety factor of 2.5-3.0. Figure 2 shows a design variation with a semicircular cross section of Part 2. The pressure on cutters is effected by a flat spring 6 . This

L 63198-65

ACCESSION NR: AP5018458

ENCLOSURE: 01

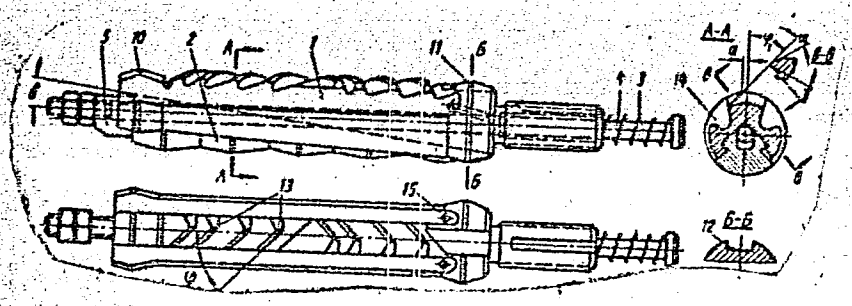

Fig. 1.

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L 63198-65

ACCESSION NR: AP5018458

ENCLOSURE: 02

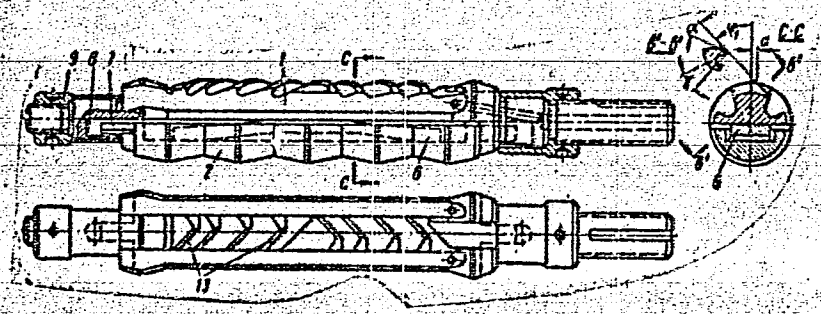

Fig. 2.

Broaching 18,44,55

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ACC NR: AP6018263 (N) SOURCE CODE: UR/0133/66/000/002/0163/0167

AUTHORS: Savishchenko, V. M. (Engineer); Proskuryakov, Yu. G. (Professor, Doctor of technical sciences)

ORG: none

TITLE: The calculation and design of vibrational installations for the elimination of internal burr in electrically welded pipes

SOURCE: Stal', no. 2, 1966, 163-167

TOPIC TAGS: pipe, metal turning, metal cutting machine tool, weld defect, welding technology

ABSTRACT: A vibrational installation was developed at the Pipe Rolling Plant, Chelyabinsk (Truboprokatnyy zavod) and is presented, which successfully eliminates the internal burr from electrically welded pipes (see Fig. 1).

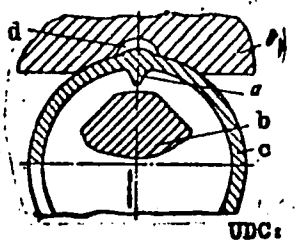

Fig. 1. Schematic of the vibrational installation for the removal of internal burr. a - burr; b - burr-removing block; c - pipe; d - channel for removal of burr.

Card 1/3 UDC: 621.774.2

ACC NR: AP6018263

A theoretical discussion of the necessary conditions for the removal of the internal burr is presented in

$$A_d = m\left[p_{sp}\, abh_0\left(\ln\frac{h_0}{h_0 - \Delta h_0'} - \frac{\Delta h_0'}{h_0}\right) + kl_0^2(a+b)\right],$$

$$p_{sp} = k\left(1 + 0{,}5\,\frac{b}{h_0} + 0{,}125\,\frac{b+h_0}{a}\right);$$

$$\Delta h_0' = h_0 \cdot \frac{\frac{kl_0(a+b)}{p_{cp}\,ab}}{1 + \frac{kl_0(a+b)}{p_{cp}\,ab}};$$

$$h_0 = \frac{h}{\cos\alpha} \text{ и } l_0 = \frac{l}{\cos\alpha};$$

$$\alpha = \operatorname{arctg}\frac{v}{2\omega H_1}.$$

where A_d is the deformation work, m - the dynamic coefficient, α - angle between the vertical and direction of burr deformation, H_1 - amplitude of burr-removing block, a - the ratio of welding rate to the frequency (ω) of the burr-removing block, and k = 1.15 σ_s. The spring stiffness and the calculated amplitude and velocity before and after impact were calculated after (Sb. Issledovaniye i raschet udarnykh mekhanizmov

Card 2/3

ACC NR: AP6018263

(Trudy Vsesoyuznogo n-i. in-ta stroitel'nogo i dorozhnogo mashinostroyeniya, vyp. XXX), M., 1961, str. 3--29). It was found that the installation could be used at any distance from the point of welding and that removal of the internal burr does not decrease the mechanical strength of the pipes. Orig. art. has: 5 graphs and 19 equations.

SUB CODE: 13, 11/ SUBM DATE: none/ ORIG REF: 003

Card 3/3

PROSKURYAKOV, Yu.G.; FEDOROV, G.A.; DAVIDYUK, V.I.

Breaking chips in machining the ends of gas pipes. Stan. i instr. 36 no.6:37-38 Je '65. (MIRA 18:8)

PROSKURYAKOV, Yu.G.; SHNEYDER, Yu.G., kand. tekhn. nauk, retsenzent; MALOV, A.N., prof., retsenzent; FEDOROV, V.B., kand. tekhn. nauk, retsenzent; STESHENKO, N.N., inzh., red.

[Hardening and sizing working methods] Uprochniaiushche-kalibruiushchie metody obrabotki; spravochnoe posobie. Moskva, Mashinostroenie, 1965. 205 p. (MIRA 19:1)

L 19194-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD
ACCESSION NR: AR3004192 S/0276/63/000/005/B056/B056

57

SOURCE: RZh. Tekhnologiya mashinostroyeniya, Abs. 5B242

AUTHOR: Proskuryakov, Yu. G.; Kulikovskikh, V. A.; Men'shakov, V. M.

TITLE: Firmness of press-joining bronze bushings after workout by mandrel-pressing method

CITED SOURCE: Sb. Sovrem. sposoby* i tekhnol. obrabotki detaley uprochnyayushche-kalibruyushchimi instrumentami. Chelyabinsk, 1962, 69-74

TOPIC TAGS: press-joining, bronze bushing, mandrel-pressing, hardness, fitting accuracy, surface neatness

TRANSLATION: Firmness of press-joining basically depends on the magnitude of clearance determining magnitudes of radial forces on the contact surface of coupled parts. In the laboratory of the kafedra "Stanki i instrument" of the Chelyabinskiy politekhnicheskiy institut ("Machine tools and Instruments" Department of the Chelyabinsk Polytechnic Institute) certain strengthening machining methods have been investigated. These were methods securing an increase in the strength of press-joints and reinforcement of material of thin-walled

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L 19194-63
ACCESSION NR: AR3004192

bronze bushings. Experiments in improvement of press-joining and increasing hardness of bronze bushing material by the mandrel-press method were carried out on bronze bushings. They were pressed into the body at a definite pressing tolerance equal 0.1 to 0.08 mm. As a result of investigations the following conclusions are made: 1) Mandrel-pressing of bronze bushing aperture, after its pressing into the enveloping machine part, increases the accuracy of pressed fitting 1.5 to 3 times. 2) Hardness of bronze bushings material mandrel pressed increases 1.5 to 2 times. 3) With a corresponding selection of methods of deformation and mandrel dimensions, the required accuracy and neatness of surface of the machined aperture may be obtained after mandrel-pressing. 4) The proposed method of increasing the strength of press-joining thin-walled bronze bushings by mandrel-pressing can be recommended for use in production. Four figures, 2 references. J. Zorokhovich.

DATE ACQ: 21Jun63 SUB CODE: MD, MA ENCL: 00

Card 2/2

PROSKURYAKOV, Yu.G., kand.tekhn.nauk; POZDNYAKOVA, I.V., inzh.

Increasing the wear resistance of surfaces by burnishing. Vest. mashinostr. 43 no.9:52-56 S '63. (MIRA 16:10)

PROSKURYAKOV, Yu.G., kand.tekhn.nauk, dotsent; KULIKOVSKIKH, V.A., aspirant

Thermal phenomena and hardening of metal surface layer machined with a smoothing die. Izv.vys.ucheb.zav.;mashinostr.no.1:162-168 '63. (MIRA 16:5)

1. Chelyabinskiy politekhnicheskiy institut.
(Surface hardening)

PROSKURYAKOV, Yu.G., kand.tekhn.nauk, dotsent; MEN'SHAKOV, V.M., inzh.

Deformations of surface roughness caused by roll or ball burnishing. Izv.vys.ucheb.zav.; mashinostr. no.8:187-198 '62. (MIRA 15:12)

1. Chelyabinskiy politekhnicheskiy institut.
(Surfaces (Technology)) (Metals—Finishing)

PROSKURYAKOV, Yu.G., kand.tekhn.nauk, dotsent; SIMAKHIN, Ya.A., inzh.

Pulling force exerter in machining cylindrical holes with multitooth broaches. Vest. mashinostr. 44 no. 4:65-68 Ap '64. (MIRA 17:5)

S/122/63/000/002/009/012
D262/D308

AUTHORS: Proskuryakov, Yu. G., Candidate of Technical Sciences, Docent, and Kulikovskikh, V. A., Engineer

TITLE: Treatment of surfaces with wire brushes

PERIODICAL: Vestnik mashinostroyeniya, no. 2, 1963, 56-59

TEXT: The article describes the experiments with disc wire brushes of various sizes and materials, rotating at 200 - 2800 rpm, used for surface finishing of steel, copper and aluminum components, in order to determine the effect of the technological parameters of the process on the surface quality. Optimal speeds, feeds, and working times are determined. The results of the experiments show that physical and mechanical properties of the surface layer differ considerably from those of the basic metal. The metallographic and structure investigations reveal that the worked surfaces are characterized by increased chemical activity, high hardness, presence on the surface of thin oxide film, and clearly marked flow of the surface layers of the metal. All this is caused by intense friction

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Treatment of surfaces ...

processes, high temperature and dynamic character of the contact of wires with the worked surfaces. The application of lubricating and cooling liquids reduces friction and temperatures of the surface layer and assists in achieving cleaner surfaces. There are 4 figures.

Card 2/2

PROSKURYAKOV, Yu. G., Dr. Tech. Sci. (diss) "Theoretical Bases of Process of Piercing Cylindrical Openings," Moscow, 1961, 32 pp (Moscow Higher Tech. School im Bauman) 200 copies (KL Supp 12-61, 261).

PROSKURYAKOV, Yu.G.; PETROV, V.N.; FEDOROV, G.A.

Breaking chips during the machining of steel 10. Stan.i instr. 33 no.7:23-24 Jl '62. (MIRA 15:7)
(Metal cutting)

S/145/61/000/007/009/009
D221/D301

AUTHORS: Proskuryakov, Yu. G., Candidate of Technical Sciences, Docent, and Men'shakov, V.M., Engineer

TITLE: Microgeometry of the surface in some methods of work hardening and calibrating machining of metals

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Mashinostroyeniye, no. 7, 1961, 159-168

TEXT: Analysis of numerous methods of work hardening and calibrating revealed that the improvement of surface finish is mainly due to crushing and smoothing out of micro-roughness by the pressing tool. Four categories of this machining are distinguished. In the first one, coining, swaging, marking, the high spots of micro-roughness are deformed by a smooth punch exerting a normal force P_n. The stress in any section of the micro spots is given by $\sigma = \frac{P_n H}{xla}$, where H is the height of the micro-roughness, x is the running distance from the apex of the

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Microgeometry of the ...

micro-roughness to the considered cross-section; a is the length of contact between the punch and the micro-rough surface; l is the length of contact between the punch and the cross surface of micro-roughness. The tips of high spots are subject to large stresses even at small loads and thus undergo plastic deformation. The increased contact with the punch spreads this process into lower layers. Special models were made for observing the character of deformation, both in steel 20 and 45, as well as brass Л62 (L62). The experiments of crushing were carried out on УИМ-50 (UIM-50) machine. Analysis of distortions of the co-ordinate grid as well as the measurement of the micro-hardness confirm the above assumptions. Curves were plotted illustrating the relation-ship between the height of the high spots and pressure during the ma-chining. The mechanical characteristics of the machined material, such as yield limit, hardness etc., have a marked effect on the height of spots in the case of static crushing. Reduction of the height of the spots increases the bearing surface which is of great importance for the wear resistance and strength of press fits and other operational

Card 2/4

qualities of machine components. The experiments revealed that there is a certain critical pressure, whose excess has no effect on reducing the height of surface roughness. Displacement of the tool in respect to the workpiece produces friction forces in addition to static crushing during finishing of metals. Investigations were carried out to determine the effect of the above motion on the height and shape of micro-roughness. The burnishing broaches were made of ШХ-15 (ShKh-15) steel. The specimens were set at various angles to the motion of the tool. The graphs of results indicate that surface finish is improved with the tool motion. This is amplified when pressure is increased. The bearing surface obtained by static pressure is 18-20% smaller than in the case of moving tool. In the latter instance, the deformation of each high spot is somewhat different in each case. During parallel displacement, build-up on the tool was noticed, and finish was inferior to that of motion across the micro-spots, when no build-up of broach took place. There are 3 figures and 1 table.

ASSOCIATION: Chelyabinskiy politekhnicheskiy institut (Chelyabinsk

S/145/61/000/007/009/009
D221/D301

Microgeometry of the ...

Polytechnic Institute)

SUBMITTED: February 28, 1961

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PROSKURYAKOV, Yu.G.; BELOV, N.F.; PETROV, V.N.

Using atomized fluids for cooling metal-cutting tools. Stan.i instr. 32 no.6:25-29 Je '61. (MIRA 14:6)
(Metal-cutting tools—Cooling)
(Metalworking lubricants)

KROSKURYAKOV, Yu.G., kand.tekhn.nauk, dotsent; MEN'SHAKOV, V.M., inzh.

Effect of some methods of hardening and sizing on the microgeometry of the worked metal surface. Izv.vys.ucheb.zav.; mashinostr. no.7:159-168 '61. (MIRA 14:9)

1. Chelyabinskiy politekhnicheskiy institut.
(Metalwork) (Surfaces (Technology)--Testing)

PROSKURYAKOV, Yu. G., kand.tekhn.nauk, dotsent; MEN'SHAKOV, V.M., inzh.

Surface microgeometry due to the working of parts by means of hardening and sizing methods. Vest.mash. 41 no.8:67-72 Ag '61. (MIRA 14:8)

(Surfaces (Technology)--Testing)

PROSKURYAKOV, Yu.G.; SIMAKHIN, Ya.A.

Machining holes with a multitooth mandrel. Mashinostroitel' no.9:38-39 S '64. (MIRA 17:10)

25.2000

80017

S/121/60/000/04/02/008

AUTHORS: Proskuryakov, Yu.G., Bezzubenko, N.K., Verkhoturov, V.Ya.

TITLE: High-Speed Gear Hobbing With Hard-Alloy Fitted Hobs

PERIODICAL: Stanki i Instrument, 1960, No 4, pp 18 - 22

TEXT: In order to carry out investigations of high-speed finishing worm hobbing, assembling hobs (three varieties) with inserted blades, fitted with hard-alloy plates, were designed and manufactured. The first type of hob design with a module of 9 mm is shown in Figure 1. The authors give a description of the hob construction, the body of which is made of 45Kh grade steel, heat-treated up to a hardness of RC 30 - 45. Figure 2 shows the hob bits, fitted with the T5K10 grade hard alloy. The durability tests of the hobs, fitted with hard-alloy bits, and carried out in co-operation with the Chelyabinsk Polytechnic Institute and the Chelyabinsk Tractor Plant had an aim to determine the optimum of hard-alloy blades and to investigate the character of their wear under various operating conditions. The hard-alloy grades T15K6 and T5K10 were tested by machining the reducer gear, made of 12KhNZA grade steel, and the skew-teeth flywheel rim, made of 40Kh grade steel, both of the S-100 tractor. The tests showed that the bits made of T15K6 grade alloy are easily

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destroyed by the chipping-off of large specks. Therefore, all further tests were made with the T5K10 grade alloy. Tests carried out with bits without chamfer at the front surface did not show any positive results. An investigation of the wear of blades showed that wear is both of a molecular and of mechanical character, i.e. that in most cases macro-particles are breaking off at the beginning and then, after some time, micro-particles are chipping off. Experimental graphs and functions were plotted in order to determine the optimum rear angles. The tests established that the durability of hobs is mainly limited by wear of the rear surfaces. Figure 3 shows an experimentally obtained graph of the ratio: cutter durability/cutting speed. Based on the tests, a cutting speed within the range of 140 - 160 m/min is recommended. The tests to determine the effects of feed on the cutter durability were carried out at a cutting speed of 142 m/min with feeds of 0.75, 1.0, 2.0 and 2.5 mm/rev. Figure 4 shows the function of hard-alloy hobs plotted against the feed (in logarithmic coordinates). By way of analytical treatment it is possible to obtain from the graphs the following empirical formulae for the rating of durability: for a feed of $s = 1 \div 2$ mm/rev - $T = \frac{275}{s^{0.33}}$ min.;

High-Speed Gear Hobbing With Hard-Alloy Fitted Hobs

for a feed of $s > 2$ mm/rev - $T = \frac{2900}{s^{3.75}}$ min. From these functions follows that small feeds (up to 1.5 mm/rev) are not to be recommended. The treatment of the test data made it possible to develop the general function for the determination of cutting speed during high-speed gear milling in the form of

$$v = \frac{9.500}{T^{0.74} s^{0.33}} \text{ m/min.}$$

This formula is correct for a feed range of $s = 1 \div 2$ mm/rev for an assumed dulling criterion of the blades at the rear surface of $h_d = 0.5$ mm, if the T5K10 grade hard alloy is being used for the machining of material with a strength limit of $\sigma_B = 75$ kg/mm^2. For other machining conditions the authors state the correction factors. If the feed is higher than 2 mm/rev the cutting speed formula is:

$$v = \frac{100\,000}{T^{0.74} s^{3.75}} \text{ m/min,}$$

although a higher feed than 2.0 mm/rev is not advisable. Figure 5 shows the distribution of wear over the teeth and that 21 blades took part in the

High-Speed Gear Hobbing With Hard-Alloy Fitted Hobs

machining of parts by the ChPI-1 cutter. In order to elucidate the possibility of obtaining the necessary machining precision another two varieties of hobs were designed. Figure 6 shows the type ChPI-2, the construction of which is described by the authors in detail. The basic geometric parameters of both the types ChPI-2 and ChPI-1 and their manufacturing allowances are the same. The setting control of the blades is effected by checking the wobble along the blade tip with the aid of an indicator. The double-cut hard-alloy milling cutter FS-3 (third variety) is designated for the machining of gears with a module of 4.25 mm. Figure 7 shows this type of cutter of which a detailed description is given. The accuracy of machined gears was checked by measuring the deviation of the intercenter distance when being turned by one tooth and one revolution. It was found that, within the durability limits of the cutter, the deviations of the intercenter distance remained practically constant. The surface finish of the machined part was checked by every fifth tooth and, as it is shown in Figure 8, it was found that the surface of the machined teeth gradually deteriorates as the wear of the cutter increases, and, at a given moment, the surface quality becomes more or less stable. The authors draw the following

High-Speed Gear Hobbing With Hard-Alloy Fitted Hobs

conclusions from their investigations: 1) High-speed finishing milling of cylindrical gears by assembling hobs equipped with hard-alloy bits is very efficient, and machining time could be reduced by 3.5 times while machining the flywheel rim of the S-100 tractor, and twice when machining the reducer gear of the same tractor. 2) Assembling hobs fitted with hard-alloy bits ensure a third class accuracy for gear hobbing on serial machine tools. 3) A surface finish of the fifth or sixth class can be obtained. 4) With high-speed finishing gear hobbing it is expedient to use the T5K10 grade hard alloy. The optimum angle of the hard-alloy blades at the front surface is 0°, that of the chamfer = 5°. 5) High-speed gear hobbing can be effected with the aid of machine tools of present serial design without considerable modernization. If new high-efficiency hobbing machines are designed, the authors recommend an increased driving power (by 40 - 50%), increased spindle rotation speed, rigidity and vibration resistance of the whole unit. The ENIMS together with the "Komsomolets" Plant developed the new 5312 and 5314 models of gear cutting machines which are not yet industrially approved. 6) Production costs of hobs are still too high and should be reduced by corresponding organization of the manufacturing process. Four graphs, 4 diagrams, 2 Soviet and 2 English references.

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PROSKURYAKOV, Yu.G., kand.tekhn.nauk, dotsent

Distribution of residual stresses caused by gauging parts with mandrels. Izv.vys.ucheb.zav.; mashinostr. no.2:119-137 '61. (MIRA 14:3)

1. Chelyabinskiy politekhnicheskiy institut.
(Metals—Finishing) (Strains and stresses)

S/121/61/000/006/008/012
D040/D112

AUTHORS: Proskuryakov, Yu.G., Belov, N.F., and Petrov, V.N.

TITLE: Cooling cutting tools by atomized cutting fluid

PERIODICAL: Stanki i instrument, no.6, 1961, 25-29

TEXT: The authors give the results of experiments with atomized cutting fluid in boring, thread-cutting, planing and milling, carried out at the cutting laboratory of the Chelyabinskiy politekhnicheskiy institut (Chelyabinsk Polytechnic Institute). The effect of the volume and chemical composition of the atomized fluid, the method of feeding the fluid to the cutting zone, nozzle shape and air pressure was studied. The experimental machine (Fig.1) made possible different combinations of fluid components, fluid quantity and air pressure. Wear of carbide-tipped cutters was measured by the wear on the main rear tool flank with the use of an МИР-1 (MIR-1) microscope, and wear of high-speed steel cutters by the depth of the pit forming on the cutter face. A different experimental unit was employed for milling cutters (Fig.8). The conclusion was made that the wear-preventing effect of atomized cutting fluid is higher than that ~~of atomized cutting fluid is higher than that~~ of flowing fluid. A higher quantity of cutting fluid

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(emulsion and "sulfofrezol" were used) had a positive effect, but 400-600 g/hr of 5% emulsion or 200 g/hr of "sulfofrezol" caused thick fog in the shop. Increased air pressure also improved the effect. The Chelyabinsk Polytechnic Institute, in conjunction with the ChTZ, developed new atomizer designs - the ЧПИ-6 (ChPI-6) and ЧПИ-7 (ChPI-7) (Fig.12) and at the same time a theoretically-based calculation method for atomizers. In the ChPI-7 (Fig.12), air from the main air pipe of the plant flows through the cock (4) and nipple (5) into the atomizer head (2) where the stream splits and some of the air flows through the duct (7) into the container (1) and exerts pressure on the surface of the fluid in it. The pressure difference causes the fluid to move through the pipe (6) into the head (2). The rest of the air flows straight through the injector where it is atomized and fed through the nipple (8) and a flexible hose to the tool edge. The flow is adjusted by the needle valve (3). The fundamental data for calculation are: the velocity (U_2) and air flow per second (Q_{air}) needed for the tool cooling; fluid flow per second (Q_{fl}); compressed air pressure (P) applied to the atomizer; the lengths of separate sections of the atomizer and the pipes. The formula for the diameter (d) of the intake pipe (6) is

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$$\frac{d^4}{(G+\alpha)} = - \frac{16 Q_{fl}}{\pi^2 g} \frac{\Delta Q_{fl}}{\Delta H_{max}} , \qquad (1)$$

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where ΔQ_{fl} is the permissible reduction of the fluid flow; ΔH_{max} - the maximum distance from the injector axis to the fluid level; g - the gravity acceleration; G - the resistance factor of the intake pipe; α - the kinetic energy factor (at laminar flow $\alpha_{lam}=2$, at turbulent flow $\alpha_t=1.06 \div 1.12$). The nozzle outlet diameter (d_2) is determined by Q_{air} and U_2 of the air jet by the equation

$$d_2 = 2\sqrt{\frac{Q_{air}}{\pi U_2}} . \qquad (2)$$

The velocity is found by the Bernoulli equation. The calculation results prove that the main factor ensuring dependable operation (stable fluid flow) is the presence of a constant positive difference between pressure in the fluid container and in the narrow section of the double-cone pipe. The formula for this difference is:

$$\Delta P_{min} = \gamma H \left(1 - \frac{1}{2} \cdot \frac{\frac{\Delta H_{max}}{H}}{\frac{\Delta Q_{fl}}{Q_{fl}}}\right) \qquad (4)$$

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where γ is the specific weight of fluid and H - the distance between the axis of the double-cone pipe and the fluid level. The formula determining the initial cross-section area as well as the diameter of the double-cone pipe (assuming a continuous air flow) is:

$$d_1 = d_2 \left(\frac{P_2}{P_1}\right)^{\frac{1}{2k}} \sqrt{\frac{U_2}{U_1}}, \qquad (5)$$

where k is the adiabatic curve factor and γ_1, γ_2 are the volumetric weights of the air in the initial cross-section of the two-cone pipe at entry and exit from the nozzle respectively. The dimensions of the narrow section of the double-cone pipe are determined in accordance with the pressure gradient needed for moving the fluid from the container into the main pipe, using the Bernoulli equation. Calculation confirmed that the fundamental parameters of the ChPI-6 atomizer were selected correctly, but it still needs some debugging. An improved modification, the ChPI-7 has been produced. Its technical data are: working air pressure 2-5 at; air consumption (at 3 gauge atmospheres) 4 m^3/hr; cutting fluid consumption 50 -900 g/hr. After the atomizers had been in use for 1 year, it was established that the wear resistance of boring tools tipped with T15K, (T15K6) alloy increased 1.5

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to 2 times and cutting efficiency 50%. Surface finish improved by approximately one ГОСТ 2789-59 (GOST 2789-59) class. There are 12 figures.

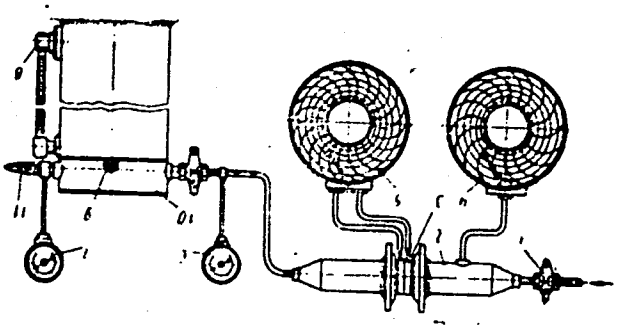

Fig.1: The experimental atomizer unit.

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