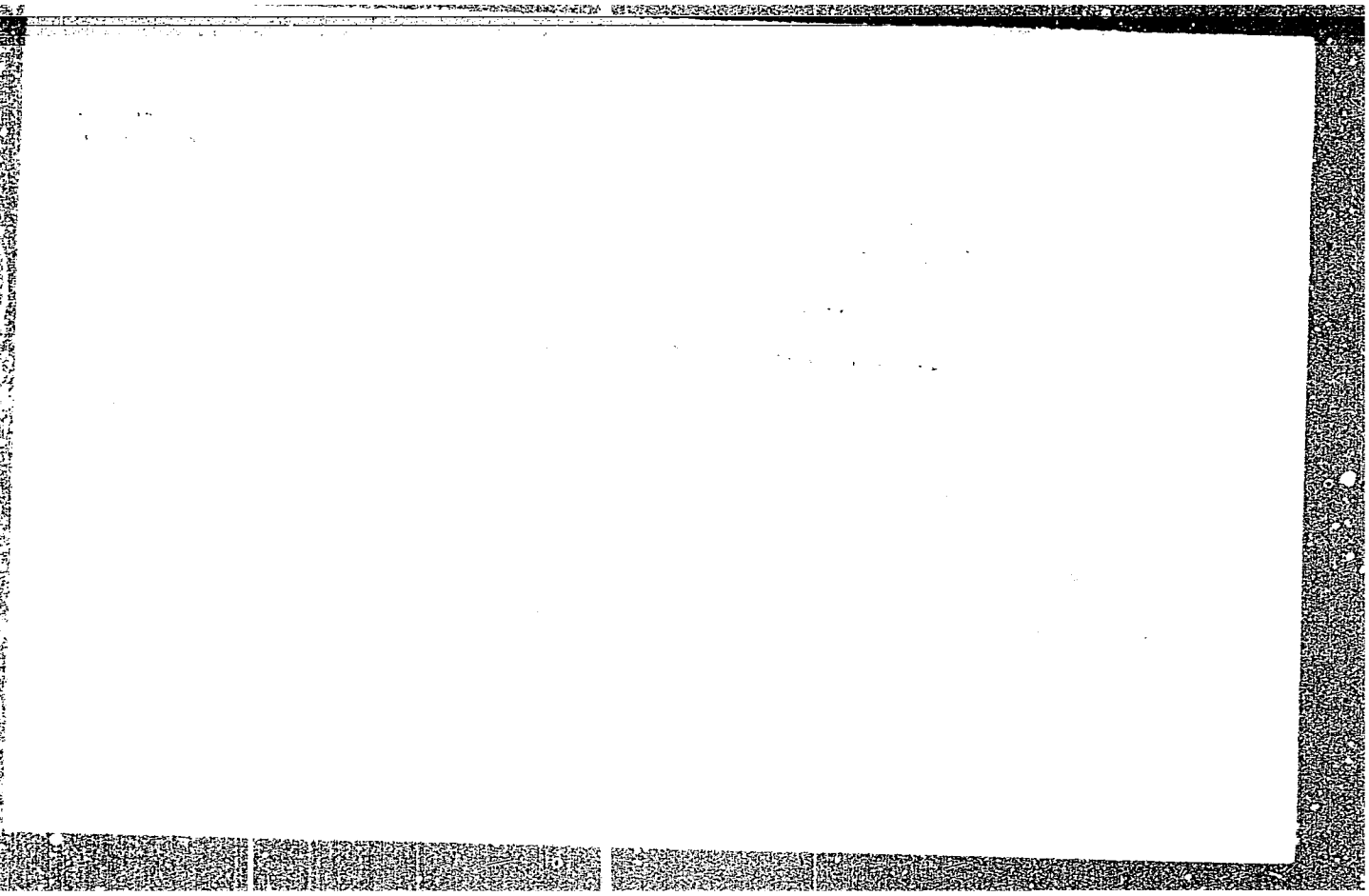

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ACC NR: AP6023397 SOURCE CODE: UR/0374/66/000/003/0380/0382

28
27
B

AUTHOR: Aslanova, M. S.; Belevich, I. S.; Tyukayev, V. N.; Gordon, S. S.

ORG: All-Union Scientific Research Institute of Fiber-Glass Reinforced Plastics and Glass Fiber, Kryukovo (Vsesoyuznyy nauchno-issledovatel'skiy institut stekloplastikov i steklyannogo volokna)

TITLE: Increasing the specific flexural rigidity of fiber-glass reinforced plastics by using hollow glass fibers

SOURCE: Mekhanika polimerov, no. 3, 1966, 380-382

TOPIC TAGS: glass fiber, reinforced plastic

ABSTRACT: An attempt was made to develop glass fiber of light structure, i. e., of hollow (capillary) tubular cross section. A special multi-drawplate unit was constructed, and the process of drawing hollow aluminoborosilicate glass fibers was studied. An experimental batch of braids made of these fibers, which had a capillarity coefficient K = 0.6-0.7 and an average outer diameter of 0.013 mm, was prepared. The physicomechanical properties of plastics reinforced with these hollow fibers in the direction of the filler were compared with those of plastics reinforced with ordinary solid glass fibers. The plastics with hollow fibers have lower elastic moduli and tensile strengths; however, because of the lower volume weight, their wall thickness is on the average 1.5 times greater, so that the flexural rigidity of such a wall is

Card 1/2 UDC: 678.01:666.212

L 04952-67
ACC NR: AP6023397

twice as high as in the case of solid fiber. In addition, plastics reinforced with hollow fibers have higher dielectric and electric insulating properties and a lower thermal and sound conductivity. Orig. art. has: 3 tables and 2 formulas.

SUB CODE: 11/ SUBM DATE: 20Jul65/ ORIG REF: 003/ OTH REF: 003

Card 2/2

KUKHARENKO, N.K.; BASIN, Ya.N.; BAL'VAS, Yu.P.; TYUKAYEV, Yu.V.

New type of models of porous strata for neutron logging. Atom. energ. 15 no.4:338-339 O '63. (MIRA 16:10)

Tyukel', G. I.

9(6) PHASE I BOOK EXPLOITATION SOV/2557

Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti. Leningradskoye oblastnoye pravleniye

Provolochnaya tenzometriya (Theory and Application of Wire Strain Gages) Moscow, Mashgiz, 1959. 138 p. (Series: Leningradskiy dom nauchno-tekhnicheskoy propagandy, kn. 51) 3,500 copies printed.

Sponsoring Agency: Nauchno-tekhnicheskoye obshchestvo priborostroitel'noy promyshlennosti.

Ed.: A.M. Turichin; Ed. of Publishing House: M.A. Chfas; Tech. Ed.: L.V. Shchetinina; Managing Ed. for Literature on the Technology of Machine Building (Leningrad Division, Mashgiz): Ye.P. Naumov.

PURPOSE: This collection of papers is intended for engineers, scientific workers, and technicians making calculations for strength in machinery.

Card 1/5

COVERAGE: This is a third issue of the collection of scientific papers presented at the Leningrad Scientific and Technical Conference on the Theory and Use of Wire Strain Gages, held in May 1958. The papers describe the use of instruments with wire strain gages to investigate different parameters of machine parts and mechanisms during operation. No personalities are mentioned. References follow several of the papers.

TABLE OF CONTENTS:

Theory (Cont.)

SOV/2557

Field Testing of Machine Strength 109

Izhevskiy, M.N. Accidental Errors in Dynamic Strain Measurement 122

Koltyshev, A.S. Machine Tools for Winding Wire Grids 135

AVAILABLE: Library of Congress

Card 5/5

GO/jb
11-19-59

TYUKEL', G.I.

Measuring gas pressure and consumption by means of membrane and bellows-type elastic elements with wire transducers. [Izd.] LONITOMASH 51:3-10. '59. (MIRA 12:12)
(Flowmeters) (Tensiometer)

Tyukel' Grigoriy Ilich

TYUKEL', Grigoriy Il'ich, inzh.; TOLCHINSKIY, Yefim Moiseyevich, inzh.; IVCHENKO, Dmitriy Fedorovich, inzh.; UDAL'TSOV, A.N., glavnyy red.; SHTEYNBOK, G.Yu., inzh.red.; POMOMARNV, V.A., tekhn.red.

[Visual multiple intermittent contact recorders of pressure and electricity] Mnogotochechnye opticheskie samopistsy davlenii i elektricheskikh velichin. Moskva, Filial Vses. in-ta nauchnoi i tekhn. informatsii, 1956. 42 p. (Pribory i stendy. Tema 4, no. P-56-522) (MIRA 11:3)

(Pressure gauges) (Electric meters)
(Recording instruments)

TYUKHANOV, Yu.M., inzh. (Krasnoyarsk)

Comparison of synchronous and asynchronous electric motors.
Elektrichestvo no.11:85 N '65. (MIRA 18:11)

SKURYGINA, P.V.; TYUKHANOVA, T.N.

Representation of certain relief forms of Yakutia. Geod.i kart. no.2:35-37 F '60. (MIRA 13:6)
(Yakutia--Frozen ground--Maps)

NIKULIN, I.A., prof. (Krasnoyarsk); TROSHIN, V.A., inzh. (Krasnoyarsk); TYUKHANOV, Yu.M., inzh. (Krasnoyarsk)

Calculation of the excitation of synchronous motors with consideration of minimum energy loss. Elektrichestvo no.4:8-14 Ap '65. (MIRA 18:5)

FOMICHEV, M.M., inzh.; TYUKHMENEV, Yu.S., inzh.; POPOV, O.M., inzh.

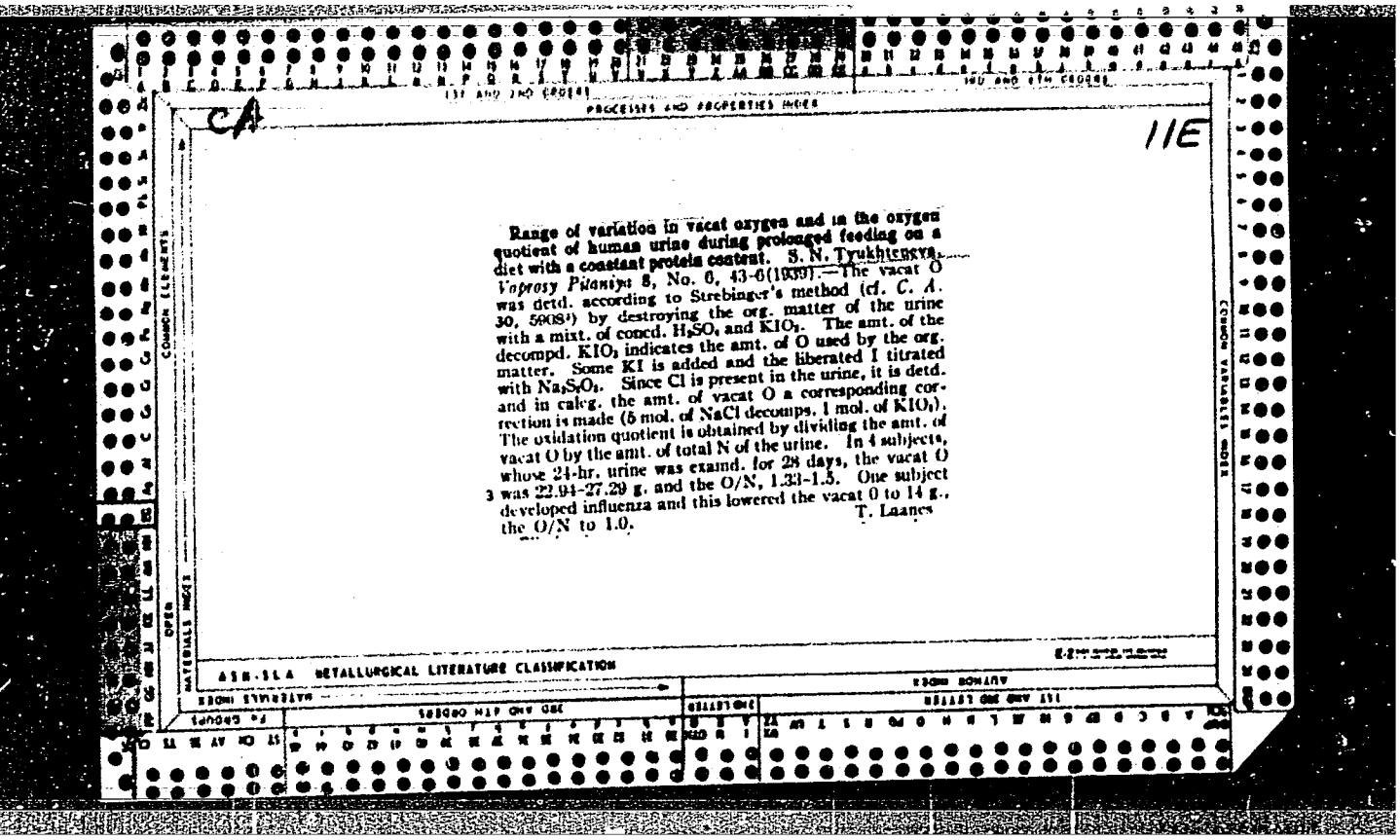
An automatic noncontact ATR-1 temperature regulator for grain driers. Vest. elektroprom. 33 no.9:24-26 S '62. (MIRA 15:10)
(Grain—Drying) (Temperature regulators)

TYUKHTENEV, Yu.N., inzh.

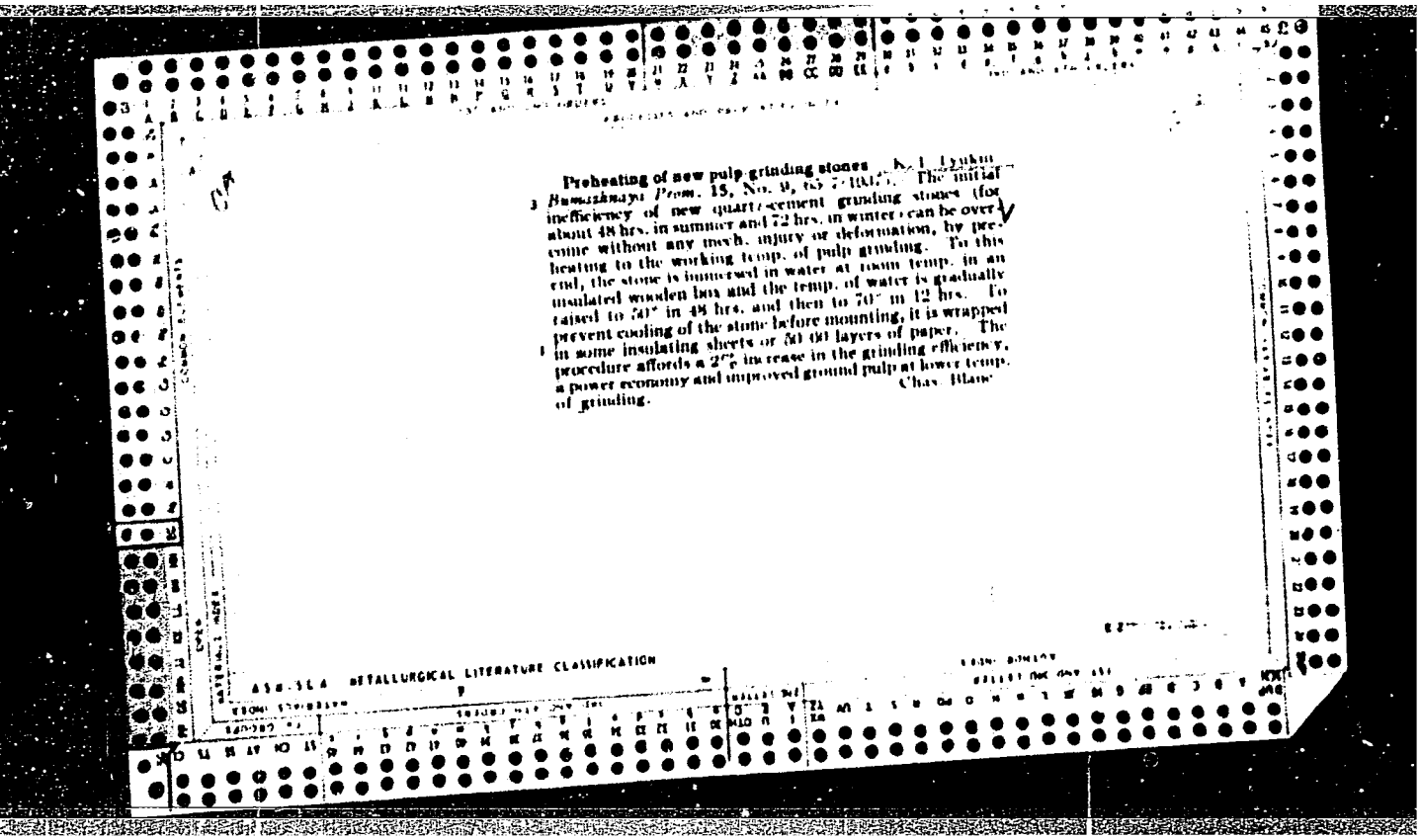
Enforce the use of electric drills and immersed pumps in oil fields. Bezop. truda v prom. 2 no.7:19-20 Jl '58. (MIRA 11:9)
(Oil fields--Equipment and supplies)

TYUKHTYAYEV, V. general-mayor aviatsii

And the power of weapons will be increased tenfold. Av. i kosm. 47 no.7:35-40 Jl '64. (MIRA 17:7)



Range of variation in vacat oxygen and in the oxygen quotient of human urine during prolonged feeding on a diet with a constant protein content. S. N. Tyukhtenova. *Voprosy Pitaniya* 8, No. 6, 43-6(1939).—The vacat O was detd. according to Strebinger's method (*cf. C. A.* 30, 5908[3]) by destroying the org. matter of the urine with a mixt. of concd. H_2SO_4 and KIO_3. The amt. of the decompd. KIO_3 indicates the amt. of O used by the org. matter. Some KI is added and the liberated I titrated with $Na_2S_2O_3$. Since Cl is present in the urine, it is detd. and in calcg. the amt. of vacat O a corresponding correction is made (5 mol. of NaCl decomps. 1 mol. of KIO_3). The oxidation quotient is obtained by dividing the amt. of vacat O by the amt. of total N of the urine. In 4 subjects, whose 24-hr. urine was exaind. for 28 days, the vacat O was 22.94-27.29 g. and the O/N, 1.33-1.5. One subject developed influenza and this lowered the vacat O to 14 g., the O/N to 1.0. T. Laanes



Preheating of new pulp grinding stones. [illegible] *Bumazhnaya Prom.* 15, No. 9, [illegible]. The initial inefficiency of new quartz-cement grinding stones (for about 48 hrs. in summer and 72 hrs. in winter) can be overcome without any mech. injury or deformation, by preheating to the working temp. of pulp grinding. To this end, the stone is immersed in water at room temp. in an insulated wooden box and the temp. of water is gradually raised to 70° in 48 hrs. and then to 70° in 12 hrs. To prevent cooling of the stone before mounting, it is wrapped in some insulating sheets or 50-60 layers of paper. The procedure affords a 2% increase in the grinding efficiency, a power economy and improved ground pulp at lower temp. of grinding.

Chas. Blanc

FOMICHEV, M., inzh.; TYUKHMENEV, Yu., inzh.; FREGER, Yu., inzh.

Electric temperature regulator for grain dryers. Muk.-elev.prom. 26 no.1:16-18 Ja '60. (MIRA 13:6)

1. Tsentral'noye konstruktorskoye byuro Elektroprivod Vsesoyuznogo nauchno-issledovatel'skogo instituta elektromekhaniki (for Fomichev, Tyukhmenev). 2. Vsesoyuznyy nauchno-issledovatel'skiy institut sel'skokhozyaystvennogo mashinostroyeniya (for Freger).
(Grain--Drying) (Temperature regulators)

TYUKHTIN, M., inzh.

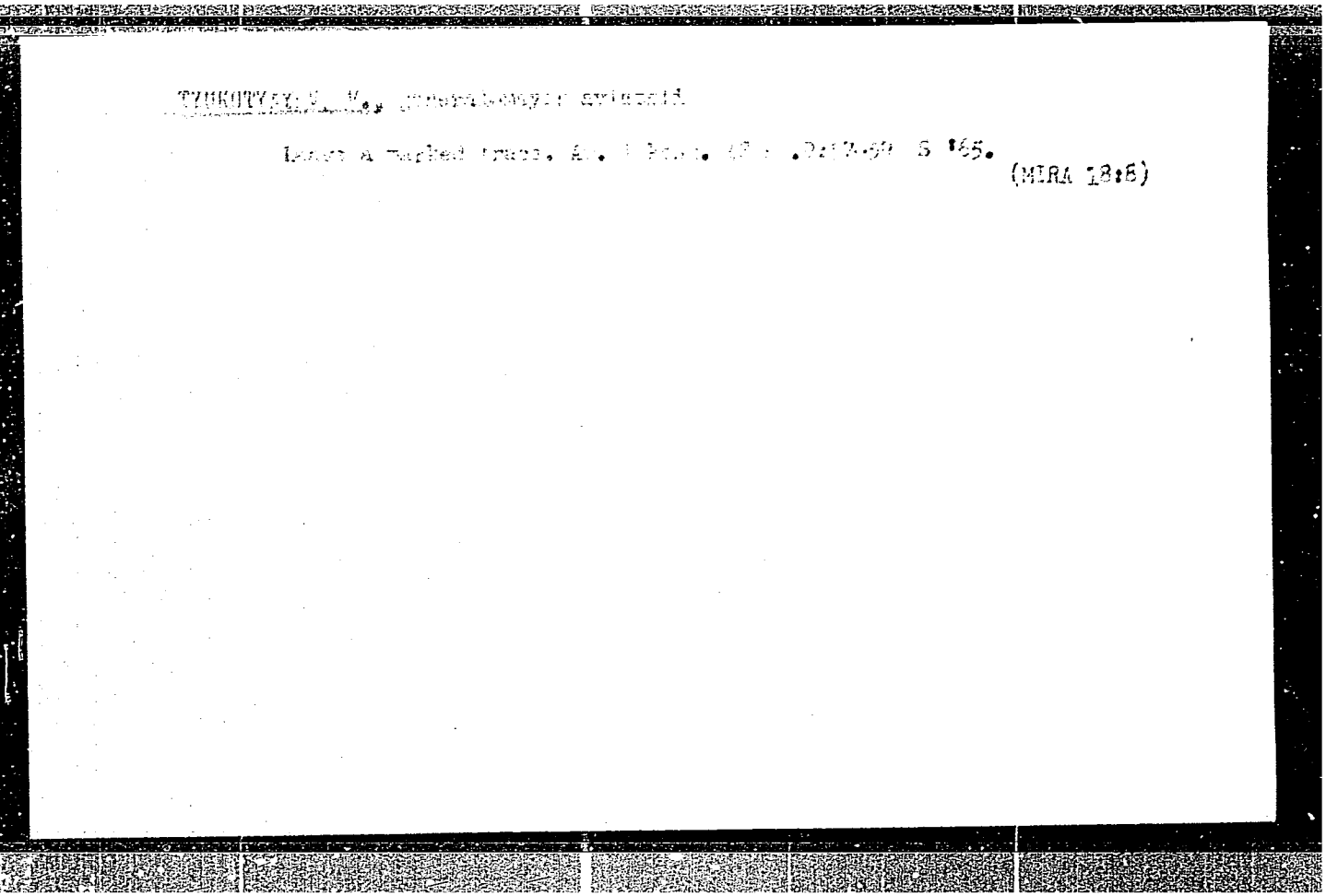
Marine radar station "Donets." Rech. transp. 20 no. 2:50-52 F '61. (MIRA 14:2)
(Radar in navigation)

TYUKHTIN, V. S.

Dissertation defended for the degree of Candidate of Philosophical Sciences at the Institute of Philosophy

"Problem of the Image (On the Nature of Psychical Reflection)."

Vestnik Akad. Nauk, No. 4, 1963, pp 119-145



(MIRA 18:8)

TYUKHTYAYEV, V.A., Gvardii general-mayor aviatsii

To the heart of every soldier. Vest.Vozd.Fl. no.3:11-17 Mr '61. (MIRA 14:6)

(Russia—Air force)

[illegible], Ya. N.; [illegible], F. N.

Electromagnetic structure of a proton and hyperfine splitting in hydrogen. Yad. fiz. 2 no.5:882-885 N '65.

(MI[illegible])

1. Ob"yedinennyy institut yadernykh issledovaniy.

TYUKHTENEVA, S.N.

Acceleration of urine mineralization in examination for lead.
Gig.i san. 26 no.1:63-66 Ja '61. (MIRA 14:6)

1. Iz Moskovskoy gorodskoy sanitarno-epidemicheskoy stantsii.
(LEAD--ANALYSIS) (URINE--ANALYSIS AND PATHOLOGY)

TYUKIN, K.I.

Avoiding loss of woodpulp on sliver screens. Bum.prom. 31 no.5: 20 My '56. (MLRA 9:8)

1. Nachal'nik drevesnomassnogo zavoda Balakhninskogo tsellyulozno-bumazhnogo kombinata.
(Balakhna--Woodpulp industry)

TYUKIN, K.I.

Removing resin from liquid woodpulp and cellulose. Bum.prom. 31 no.3:24 Mr '56. (MLRA 9:7)

1.Nachal'nik drevesnomassnogo zaveda Balakhninskogo tsellyulozno-bumazhnogo kombinata.
(Woodpulp)

TYUKIN, K.I., nachal'nik drevesnomassnogo zavoda.

Breakdowns of grinder stones. Bum. prom. 28 no.6:21-23 Je '53.(MLRA 6:6)

1. Balakhninskiy tsellyulozno-bumazhnyy kombinat.
(Wood-pulp industry)

TOMASHOV, N. D., TYUKIN, M. N., BLINCHERSKIY, G. K.

USSR (600)

Aluminum - Corrosion.

Device for relative evaluation of the elasticity of anodic coatings on aluminum. Trudy Inst. fiz.khim. AN SSSR, No. 3, 1951.

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

TOMASHOV, N. D., TYUKIN, M. N., BLINCHERSKIY, G. K.,

Aluminum - Corrosion

Device for relative evaluation of the elasticity of anodic coatings on aluminum. Trudy Inst. fiz. khim. AN SSSR, No. 3, 1951.

9. Monthly List of Russian Accessions, Library of Congress, May 1952 1953, Uncl.

TOMASHOV, N. D., TYUKIN, M. N., BLINCHEVSKIY, G. K.

Aluminum - Corrosion

Device for relative evaluation of the elasticity of anodic coatings on aluminum. Trudy Inst. fiz. khim. AN SSR, No. 3, 1951

9. Monthly List of Russian Accessions, Library of Congress, May 1952 ////, Uncl.

PIZHURIN, Andrey Abramovich, kand. tekhn. nauk, dots.; BLITSHTEYN, Aleksandr Zinov'yevich, kand. tekhn. nauk, dots.; SURIKOV, Vladimir Tikhonovich, kand. tekhn. nauk, dots.; SAKHAROV, V.V., inzh., retsenzent; TYUKIN, N.N., prepod., retsenzent; PEREL'MUTER, N.M., red.

[Electrical equipment of the lumber and woodworking industry] Elektrooborudovanie predpriiatii lesnoi i derevoobrabatyvaiushchei promyshlennosti. Moskva, Lesnaia promyshlennost', 1965. 358 p. (MIRA 18:11)

1. Kostromskoy lesomekhanicheskiy tekhnikum (for Tyukin).

RYZHIKH, T.P., dorozhnyy master; TYUKHIN, T.I., dorozhnyy master

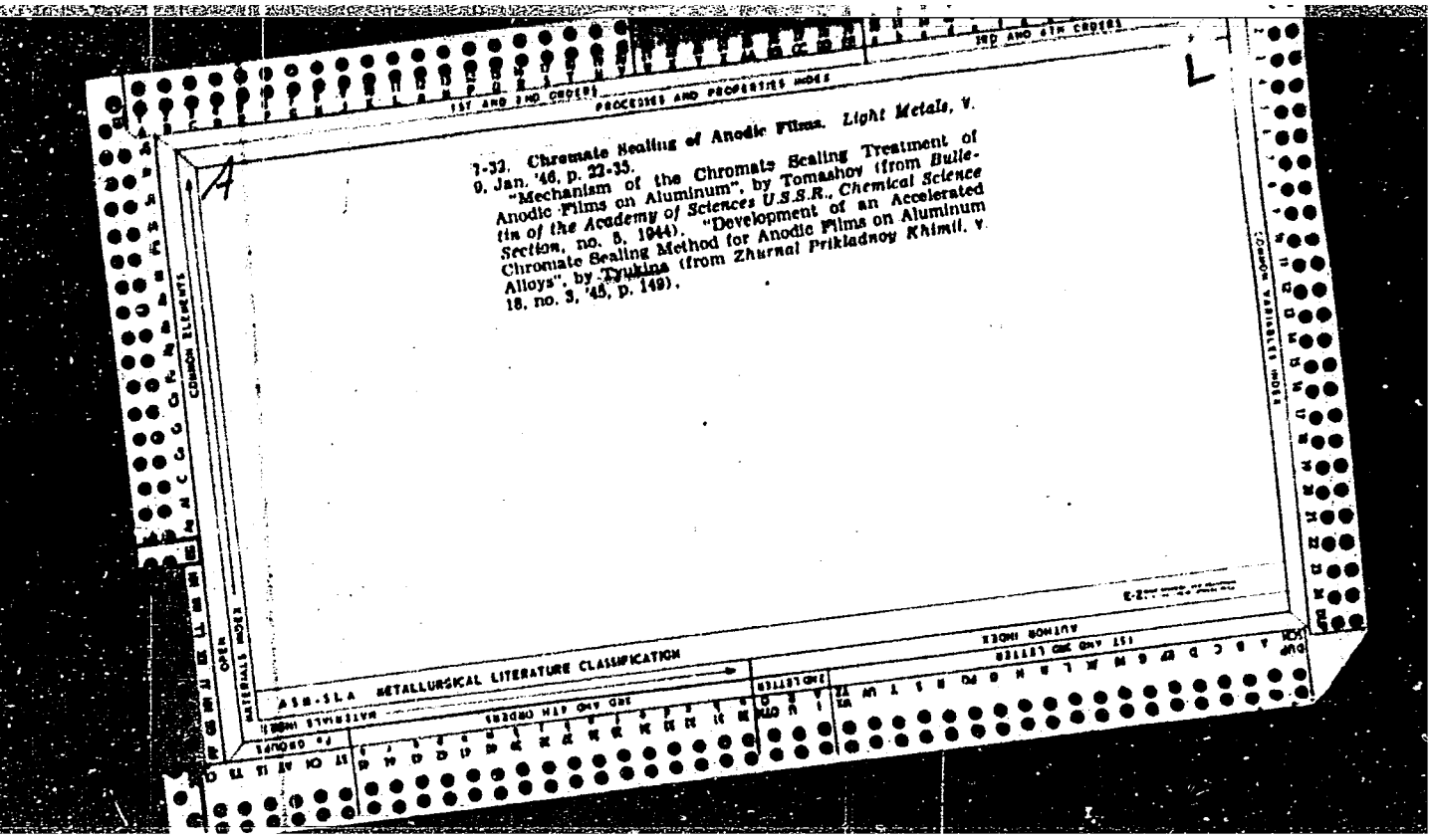
Our proposals for the seven-year plan. Put' i put.khoz. no.11:31 N '58. (MIRA 11:12)

1. 2-y okolotok Ostrogozhskoy distantsii puti Yugo-Vostochnoy dorogi, stantsiya Palatovka.
(Railroads--Track)

TYUKIN, V.A., polkovnik meditsinskoy sluzhby

Types of medical care. Voen.-med.zhur. no.7:78-79 Jl '59.
(MIRA 12:11)

(MEDICAL CARE)



1-33. **Chromate Sealing of Anodic Films.** *Light Metals*, v. 9, Jan. '46, p. 22-35.
"Mechanism of the Chromate Sealing Treatment of Anodic Films on Aluminum", by Tomashov (from *Bulletin of the Academy of Sciences U.S.S.R., Chemical Science Section*, no. 5, 1944). "Development of an Accelerated Chromate Sealing Method for Anodic Films on Aluminum Alloys", by Tyukina (from *Zhurnal Prikladnoy Khimii*, v. 18, no. 3, '45, p. 149).

TYUKINA, A.P., kand.med.nauk; PIYANKOV, S.M.

Significance of cold and moisture in the development of obliterating diseases of the vessels in the extremities. Sov.med. 28 no.11:91-95 N '65. (MIRA 18:12)

1. Klinika obshchey khirurgii (zav. - prof. S.A.Grinev) Arkhangel'skogo meditsinskogo instituta.

L 09968-67 EWT(1) GD

ACC NR: AT6022275 SOURCE CODE: UR/0000/66/000/000/0053/0056

AUTHOR: Stolyarov, A. K.; Tyukov, I. P.

ORG: none

TITLE: Theoretical problems of three-port circulators constructed of dielectric filled waveguides

SOURCE: Vsesoyuznaya nauchnaya sessiya, posvyashchennaya Dnyu radio. 2d, 1966. Sektsiya kvantovoy elektroniki. Doklady. Moscow, 1966, 53-56

TOPIC TAGS: waveguide, wave propagation, dielectric waveguide

ABSTRACT: The precise expressions for wave propagation in a three-port circulator fabricated using dielectric filled waveguides were obtained from the solution of the diffraction problem for wave dispersion in a symmetrical H-plane waveguide junction. The following relations may be derived assuming ideal circulation conditions:

$$f_{\pm}\left(k, t, \frac{a}{\lambda}\right) = \frac{J_0(x)x}{J_1(x)} - R_{\pm} = 0,$$

$$e_{\pm}\left(k, t, \frac{a}{\lambda}\right) = \frac{S_0(t)R_{\pm}}{\operatorname{tg}\left\{\delta_{-1}^{\pm} + [N_1(t) - N_0(t)] + \frac{\pi}{3}\right\} - L_0(t)},$$

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$$R_{\pm} = 1 - \mu_{\perp}\frac{L_1(t)}{S_1(t)} \pm \sqrt{\left(\frac{k}{\mu}\right)^2 - \left(\frac{\mu_{\perp}}{S_1(t)}\right)^2 + \frac{2}{\operatorname{tg} 60^\circ}\frac{k\mu_{\perp}}{\mu S_1(t)}},$$

$$\delta_{\pm 1} = \operatorname{arc\,tg}\left\{\frac{kS_1(t)}{\mu\mu_{\perp}} \times \right.$$

$$\left. \times\left(1 \pm \sqrt{\left[\operatorname{tg} 60^\circ - \frac{\mu\mu_{\perp}}{kS_1(t)}\right]\left[\operatorname{tg} 30^\circ + \frac{\mu\mu_{\perp}}{kS_1(t)}\right]}\right)\right\},$$

$$x = t\sqrt{\varepsilon\mu_{\perp}} = t\sqrt{\varepsilon\frac{\mu^2 - k^2}{\mu}},$$

where $S_0(t)$, $L_0(t)$, $N_0(t)$, $S_1(t)$, $L_1(t)$, $N_1(t)$ depend only on the values of t, the diameter, and a is the width of the wide waveguide wall; $2r$ is the diameter of the ferrite cylinder, ε_ϕ, ε_ϑ are the dielectric constants of the ferrite and the surrounding space, and μ, k are the tensor components of ferrite permeability. The plots of energy transfer coefficients into port 2 and port 3 are given. Orig. art. has: 3 figures.

SUB CODE: 09,20/ SUBM DATE: 11Apr66/ ORIG REF: 001/ OTH REF: 001

Card 2/2 blp

L 33375-66 EWT(m)/T/EWP(f) WW/WE

ACC NR: AP6020556 SOURCE CODE: UR/0414/66/000/001/0088/0099

75
B

AUTHOR: Tyul'panov, R. S. (Novosibirsk)

ORG: none

TITLE: Calculation of the combustion of atomized hydrocarbon fuel in forced combustion chambers

SOURCE: Fizika goreniya i vzryva, no. 1, 1966, 88-99

TOPIC TAGS: combustion, gas turbine, liquid fuel, combustion chamber, hydrocarbon fuel, combustion characteristic

ABSTRACT: A method for calculating the combustion time of hydrocarbon fuel droplets in gas turbine combustion chambers was developed on the basis of a model which divides the combustion into two stages. In the first stage, the droplet stagnates, and in the second stage, the droplets attain the same velocity as the gas stream. In the latter stage, evaporation and combustion follow a turbulent flow model. To verify the method, published experimental data were processed for solar oil and M-20 and M-40 heavy fuels at pressures of 1.3—3.7 atm, flow velocities of 14—46 m/sec, and air excess coefficients of 1.2—2.5. It was shown that the proposed method for calculating the length of the combustion zone can be used for general practical calculations. Orig. art. has: 15 formulas and 4 figures. [PV]

SUB CODE: 21/ SUBM DATE: 19Jul65/ ORIG REF: 009/ OTH REF: 003/ ATD PRESS 5026

UDC: 536.468

Card 1/1 JS

TYUKINA, A.P., kandidat meditsinskikh nauk (Arkhangel'sk, ul. Serafimovicha, d.30, kv.4)

Diplococcal peritonitis. Nov.khir.arkh. no.4:67-69 Jl-Ag '57. (MIRA 10:11)

1. Kafedra obshchey khirurgii (zav. - prof. G.A.Orlov) Arkhangel'skogo meditsinskogo instituta.
(PERITONITIS) (DIPLOCOCCUS)

ORLOV, G.A., prof.; TYUKINA, A.P., kand.med.nauk

Important issue of the problem of man's acclimatization in the North. Biul. uch. med. sov. 2 no.5:21-24 S-O '61. (MIRA 14:11)
(COLD--PHYSIOLOGICAL EFFECT) (ACCLIMATIZATION)

TYUKINA, A.P., kand.med.nauk (Arkhangel'sk)

Injuries from electricity at logging enterprises. Fel'd. i akush. 26 no.5:24-28 My '61. (MIRA 14:5)
(ELECTRICITY, INJURIES FROM)

TYUKINA, A.P., kand. med. nauk

Occupational neurovascular diseases of the extremities in workers engaged in timber-rafting in Arkhangel Province. Gig. i san. 28 no.11:149-152 N '63 (MIRA 18:1)

1. Iz kliniki obshchey khirurgii (zav. - zasluzhennyy deyatel' nauki prof. G.A. Orlov) Arkhangel'skogo meditsinskogo instituta.

TYUKINA, A.P.; VESHCHAGIN, Yu.A. (Arkhangel'sk)

Occupational diseases of the hand and arm in locksmiths and assembly men of a furniture factory. Gig. truda i prof. zab. 7 no.1:53-56 Ja'63 (MIRA 16:12)

1. Arkhangel'skiy meditsinskiy institut.

TYUKINA, A.P., kand.med.nauk

Neurovascular diseases of the extremities as a result of cold. Fel'd. i akush. 28 no.2:8-11 F '63. (MIRA 16:9)

1. Iz kafedry obshchey khirurgii Arkhangel'skogo meditsinskogo instituta.

(EXTREMITIES (ANATOMY)—DISEASES)
(COLD—PHYSIOLOGICAL EFFECT)

VUKINA, I.A.

Development of mechanics at Moscow University in the 18th and 19th centuries. Ist.-mat.issl. no.8:489-536 No.8 '55. (MLRA 9:6)
(Moscow University) (Mechanics--History)

TYUKINA, Aleksandra Petrovna, kand med. nauk; GOFMEKLER, V.A., red.; ROMANOVA, Z.A., tekhn. red.

[Prevention of injuries in lumbering camps]Profilaktika travmatizma na lesozagotovkakh. Moskva, Medgiz, 1962. 52 p. (MIRA 15:9)

(LUMBERING--SAFETY MEASURES)

TYUKINA, A.P. (Arkhangel'sk, ul. Serafimovicha,d.30,kv.4)

Vascular anomalies simulating a mediastinal tumor. Grud. khir. (MIRA 15:3)
1 no.5:109-110 S-O '61.

1. Iz kliniki obshchey khirurgii (zav. - prof. G.A. Orlov) Arkhangel'skogo meditsinskogo instituta (dir. - dotsent A.A. Kirov).
(AORTA—ABNORMITIES AND DEFORMITIES)

ZALIVALOV, F.P.; TYUKINA, M.N.; TOMASHOV, N.D.

Properties and microstructure of thick anodic films on aluminum. (MIRA 15:4)
Zhur.VKHO 7 no.2:235-236 '62.

1. Institut fizicheskoy khimii AN SSSR.
(Metallic films) (Aluminum oxide)

TYUKINA, M.N.; IGNATOV, N.N.; ZALIVALOV, F.P.; TOMASHOV, N.D.

Anodic oxidation of aluminum-copper alloys in sulfuric acid. Zhur.prikl. khim. 36 no.2:338-344 F '63. (MIRA 16:3)
(Aluminum-copper alloys) (Oxidation, Electrolytic)

21038
S/598/61/000/006/028/034
D217/D303

5.1310 1087

AUTHORS: Matveyeva, T.V., Tyukina, M.N., Pavlova, V.A., and Tomashov, N.D.

TITLE: Investigating the anodic oxidation of titanium in sulphuric acid solutions

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Titan i yego splavy. no. 6, 1961. Metallotermiya i elektrokhimiya titana, 211 - 220

TEXT: The results of investigating the anodic oxidation of Ti in aqueous H_2SO_4 solutions and the properties of the oxide films in relation to the conditions of anodizing (concentration and temperature of electrolyte, time of anodizing and anodic current density) are reported. The material studied was annealed Ti sheet from an experimental batch, having an elongation of 14.8%, produced powdermetallurgically and having the following chemical composition 0.13 % Fe, 0.15 % Ni, 0.17 % Si, 0.050 % C, 0.098 % N_2 and 0.34 % Ca. Ti iodide and Ti of specification VT1 were used as reference specimens in individual experiments. The specimens were cleaned

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Investigating the anodic oxidation ...

with emery paper, degreased with acetone, etched for 15 seconds at room temperature in a solution consisting of 15 % HF and 5 % HNO_3 and rinsed with water. Anodizing was carried out in the same way as for Al. The solution was agitated and the current was supplied across anodized Ti terminals. In the course of anodizing, the voltage was changed, the anodic current density being kept constant. The properties of the films obtained were determined by means of a drop method developed by the authors, using a solution consisting of 1.22 % HF, 0.91 % HNO_3, remainder - water. The time taken for intense evolution of gas bubbles to begin after application of a drop of the above solution to a restricted film surface, was noted. Films possessing the best protective properties (according to their drop test performance), were also tested for their corrosion resistance by semi-immersing the specimens in 40 and 75 % solutions of H_2SO_4 at 30°. The weight of the films was determined from the loss in weight sustained by the anodized specimens on removing the film. The films were removed by cathodic polarization without noticeable dissolution of metallic Ti, using a current of 1.5 mA/cm^2 in a 20 % H_3PO_4 solution with addition of 0.1 % CrO_3 at 80°. The film thick-

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D217/D303

Investigating the anodic oxidation ...

ness was calculated form the weight. It is shown that anodic oxidation of Ti in H_2SO_4 solutions at room temperature requires a high terminal voltage, as a result of which films of low quality form. Raising the temperature of the electrolyte to 80° and above, results in a decrease in terminal voltage and enables films of better protective qualities to be obtained. The following methods of anodizing Ti in H_2SO_4 solutions were found to give satisfactory results: 1) 18 % H_2SO_4 solution, temperature: 80°, anodic current density: 0.5 A/dm^2, anodizing time: 2 - 8 hours; 2) 18 % H_2SO_4 solution, temperature: 100°, anodic current density: 2 A/dm^2, time of anodizing: 2 hours. There are 9 figures, 3 tables and 14 references: 3 Soviet-bloc and 11 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: P.D. Miller, R.A. Jefferys, and H.A. Pray, Metal Progress, 1956, 69, 61; H.A. Johansen, G.B. Adams and P. van Rysselberghe, J. Electrochem. Soc., 1957, 104, 339; H. Richard, Metal Finishing Journal, 1957, 3, 10; H. Nagasaki, H. Ishida, Keikindzoky Light Metals, 1958, 8, 60.

Card 3/3

S/137/62/000/006/144/163
A057/A101

AUTHORS: Matveyeva, T. V., Tyukina, M. N., Pavlova, V. A., Tomashov, N. D.

TITLE: Investigation of the anodic oxidation of titanium in sulfuric acid solutions

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1962, 97, abstract 6I612 (V sb. "Titan i yego splavy". no. 6, Moscow, AN SSSR, 1961, 211 - 220)

TEXT: Annealed Ti sheets with δ 14.8% and the following chemical composition were investigated (in %): Fe 0.13, Ni 0.15, Si 0.17, C 0.050, N 0.098, Ca 0.34. The anodizing was carried out in H_2SO_4 solutions. Properties of the coatings were investigated in dependence on the conditions of anodizing: the concentration and temperature of the acid, the duration of anodizing, and D_a. The anodic oxidation of Ti proceeds in H_2SO_4 solutions at room temperature at high voltage at the terminals, therefore coatings of low quality are obtained. An increase of the temperature of the acid, especially to 80°C and more, decreases the voltage on the terminals yielding thus coatings with better protectice properties. The following optimum conditions of anodizing are presented: 1) 18% H_2SO_4

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S/137/62/000/006/144/163
A057/A101

Investigation of the...

solution, temperature 80°C, D_a 0.5 a/dm^2, duration of anodic oxidation 2 - 8 hrs; 2) 18% H_2SO_4 solution, temperature 100°C, D_a 2 a/dm^2, duration of anodic oxidation 2 hrs. There are 14 references.

Ye. Layner

[Abstracter's note: Complete translation]

Card 2/2

S/128/61/000/012/001/004
A004/A127

AUTHORS: Zalivalov, F.P.; Tyukina, M.N.; Ignatov, N.N.

TITLE: Deep anodizing of aluminum chill molds

PERIODICAL: Liteynoye proizvodstvo, no. 12, 1961, 11

TEXT: Referring to former works (Ref. 1: N.D. Tomashov, "Vestnik inzhenerov i tekhnikov", no. 2, Moscow, 1946; Ref. 2: N.D. Tomashov, M.N. Tyukina, "Issledovaniya po korrozii metallov", no. 1, Trudy Instituta fizicheskoy khimii, AN SSSR, no. 2, izd-vo AN SSSR, Moscow 1951; Ref. 3: N.D. Tomashov, A.V. Byalobzheskiy, "Issledovaniya po korrozii metallov", no. 4, Trudy Instituta fizicheskoy khimii AN SSSR, no. 5, Izd-vo AN SSSR, Moscow - Leningrad, 1955) the author points out that deep anodizing produces on the surface of aluminum and its alloys a hard oxide coat which possesses a considerable resistance to high temperatures. The low heat conductivity of anode coats (0.001 - 0.003 cal/cm · · sec °C) of at least 150 - 300 μ thickness limits the heat transfer to the mold metal and prevents its melting. This property of the aluminum oxide coat was utilized in the manufacture of molds for the casting of h-f aluminum and magnesium alloys. The mold was made of pure AB000 (AV000) aluminum (99.99%)

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Deep anodizing of aluminum chill molds

S/128/61/000/012/001/004
A 004/A127

and ABO (AVO) commercial aluminum. The inner mold surface was coated with a thick oxide layer obtained in a 2N-solution of sulfuric acid at a constant current density of 2.5 amp/dm^2 and an electrolyte temperature of 0 - 3°C. The surfaces not being anodized were covered with AK-20 (AK-20) nitro lacquer. The anodizing time was 3 h, the obtained coat was 150 - 180 μ thick. Ingots of six aluminum alloys with copper (3 - 8% Cu) and four magnesium alloys with zinc (3 - 5% Zn) were cast in the molds, the maximum alloy temperature prior to casting being 720 - 740°C. The alloys were melted under a flux, which, for the aluminum alloys consisted of 55% KCl and 45% NaCl, for the magnesium alloys of 54% KCl and 46% LiCl. After the casting of these 10 ingots the anode coat remained completely intact while its hardness even increased somewhat due to dehydration. The walls of aluminum molds should be thicker than those of iron molds. The use of additional external cooling makes it possible to use aluminum chill molds also for metals with higher melting points. There are 1 figure and 4 Soviet-bloc references.

Card 2/2

MATVEYEVA, T.V.; TYUKINA, M.N.; PAVLOVA, V.A.; TOMASHOV, N.D.

Investigating the anodic oxidation of titanium in sulfuric acid solutions. Titan i ego splavy no.6:211-220 '61. (MIRA 14:11)
(Titanium--Electrometallurgy) (Oxidation, Electrolytic)

36059
S/063/62/007/002/014/014
A057/A126

1.1800

AUTHORS: Zalivalov, F.P., Tyukina, M.N., Tomashov, N.D.

TITLE: Properties and microstructure of thick layers of anodic films on aluminum

PERIODICAL: Zhurnal vsesoyuznogo khimicheskogo obshchestva imeni D.I. Mendeleyeva, v. 7, no. 2, 1962, 235 - 236

TEXT: The effect of the conditions of electrolysis in sulfuric acid on microstructure characteristics of anodic layers was demonstrated in earlier papers. The effect of the microstructure of anodic layers on their properties is investigated in the present work. Electrodes of AP.000 (AV 000) aluminum containing 99.99% Al were used and anodic oxidation was carried out in 4 N H_2SO_4, according to a method of the present institute. These conditions allowed the preparation of layers with different, but exactly defined structures. It was observed that an increase of the oxide cell of structure (distance between two parallel planes of the cell, which increases with current density) also increases the micro-hardness and strength of the anodic layer. Thus with an increase of aluminum oxide cell from 280 Å to 547 Å micro-hardness increased from 350 to 600 kg/mm^2.

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S/063/62/007/002/014/014
A057/A126

Properties and microstructure....

Since the diameter of the pores remains constant and the increase of the cell is effected by an increase of the thickness of the walls, the rise in micro-hardness and endurance is easily to explain. Therefore, in the manufacture of anodic coatings with high mechanical properties, electrolytic conditions must be applied which allow formation of coarse structure cells. No protection can be effected by the aluminum oxide layer in media which dissolve the oxide. In these media the layer between metal and oxide film protects the metal. The thickness of this barrier layer was determined by a method described by N. Vernik and R. Pinner. Chemical resistance of the anodic layer increases with the thickness of the barrier layer, since the latter prevents the penetration of agressive ions through pores of the aluminum oxide film. Thus an increasing of the barrier layer from 102 Å to 266 Å increases more than twice the time necessary for the penetration of agressive ions. There are 2 figures and 4 references.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: May 14, 1961

Card 2/2

TOMASHOV, Nikon Danilovich. Prinimali uchastiye: TYUKINA, M.N.; PALEOLOG, Ye.N.; CHERNOVA, G.P.; MIKHAYLOVSKIY, Yu.N.; LUNEV, A.F.; TIMONOVA, M.A.; MODESTOVA, V.N.; MATVEYEVA, T.V.; BYALOBZHESKIY, A.V.; ZHUK, N.P.; SHREYDER, A.V.; TITOV, V.A.; VEDENEYEVA, M.A.; LOKOTILOV, A.A.; BERUKSHTIS, G.K.; DERYAGINA, O.G.; FEDOTOVA, A.Z.; FOKIN, M.N.; MIROLYUBOV, Ye.N.; ISAYEV, N.I.; AL'TOVSKIY, R.M.; SHCHIGOLEV, P.V.. YEGOROV, N.G., red.izd-va; KUZ'MIN, I.F., tekhn.red.

[Theory of the corrosion and the protection of metals] Teoriia korrozii i zashchity metallov. Moskva, Izd-vo Akad.nauk SSSR, 1959. 591 p. (MIRA 13:1)

(Corrosion and anticorrosives)

Tyukina, M.N.

PHASE I BOOK EXPLOITATION SOV/4271

Akademiya nauk SSSR. Institut fizicheskoy khimii

Issledovaniya po korrozii metallov. [vyp.] 5: Novyye metody i pribory dlya korrozionnykh ispytaniy (Investigations on Corrosion of Metals [No. 5]: New Methods and Instruments for Corrosion Testing) Moscow, Izd-vo AN SSSR, 1959. 176 p. (Series: Its: Trudy, vyp. 7) Errata slip inserted. 3,000 copies printed.

Resp. Ed.: N. D. Tomashov, Doctor of Chemistry, Professor; Ed. of Publishing House: N. G. Yegorov; Tech. Eds: G. A. Astaf'yeva and Ye. V. Zelenkova; Editorial Board: N. D. Tomashov, A. V. Byalobzheskiy, Candidate of Chemistry, and P. V. Shchigolev, Candidate of Chemistry.

PURPOSE: This collection of articles is intended for scientific workers at research institutes and technical personnel of plant laboratories.

COVERAGE: The articles included in this collection deal basically with methods of corrosion investigation which have not yet been published in Soviet periodical literature but are of definite interest for studying corrosion processes. A wide range of problems is covered. In addition to the methods discussed the articles provide some experimental data which make possible full utilization of each individual method. No personalities are mentioned. References accompany each article.

Investigations on Corrosion (Cont.) SOV/4271

AVAILABLE: Library of Congress

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VK/pw/fal
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24012
S/080/61/034/006/015/020
D247/D305

18 8360

AUTHORS: Matveyeva, T.V., Tyukina, M.N., and Pavlova, V.A.

TITLE: Dependence of the rate of corrosion of anodized binary aluminum-base alloys on their copper content

PERIODICAL: Zhurnal prikladnoy khimii, v. 34, no. 6, 1961, 1365 - 1367

TEXT: The role of copper concentration on the rate of corrosion of aluminum alloys and the properties of anodic oxide films, produced on their surfaces, was investigated. The rate of corrosion was determined by the volume of oxygen absorbed and hydrogen evolved, using an apparatus described by N.D. Tomashov and T.V. Matveyeva (Ref. 3: Tr. Inst. fiz. khim. AN SSSR, 3, 2, 39, 1951). Binary aluminym-base alloys containing 1.9, 2.95, 3.96, 5.48 and 7.63 % copper were tested, the materials used for the preparation of the alloys being AB000 (AV000) aluminum (99.99 %) and spectroscopically pure copper. All alloys were homogenized at a temperature of 485°

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Dependence of the rate of ...

for 240 hours, followed by quenching in water at room temperature. Metallographic analysis showed that alloys containing up to 3.96 % copper were homogeneous solid solutions. Alloys containing 5.48 and 7.63 % Cu consisted of a mixture of solid solution and eutectic. Anodic oxidation was carried out in a 4N sulphuric acid solution at a current density of 1 A/dm^2 and a temperature of 25° for 20 minutes. The thickness of the films produced was 5 - 7 μ. Corrosion tests were carried out by fully immersing the specimens in a 0.5 N sodium chloride solution at a temperature of 25° and a pressure of 760 mm Hg. Fig. 1 shows the relationship between volume of hydrogen evolved (and oxygen absorbed) and time in the corrosion of anodized aluminum alloys of various copper contents, and Fig. 2 shows the same relationship for non-anodized alloys. From these two graphs it can be seen that corrosion of the alloys tested in a 0.5 N sodium chloride solution takes place with mixed oxygen-hydrogen depolarization. In still, thermostatically controlled solutions of the above composition, the rate of corrosion of Al-Cu alloys, anodized by the normal sulphuric acid method, is approximately

Dependence of the rate of ...

half that of non-anodized alloys. As the copper content increases, so the rate of corrosion increases, at first essentially due to an increase in the rate of depolarization by oxygen, and subsequently only due to depolarization by hydrogen. There are 2 figures and 3 Soviet-bloc references.

SUBMITTED: July 19, 1960

Card 3/5

22003
S/076/61/035/004/010/018
B106/B201

18.7400 also 1043, 1208, 1087

AUTHORS: Zalivalov, F. P., Tynkina, M. N., and Tomashov, N. D.

TITLE: Effect of conditions of electrolysis upon the formation and growth of anodic oxide coatings on aluminum

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 4, 1961, 879 - 886

TEXT: A study has been made of the microstructure of anodic oxide coatings on aluminum with the aid of an ЭМ-3 (EM-3) electron microscope. The coatings were obtained in sulphuric medium by the method of hard anodizing. This special procedure, which has been developed at the authors' institute (Ref. 4: N. D. Tomashov, Vestn. inzh. i tekhn., no. 7, 59, 1946; Ref. 5: N. D. Tomashov, M. N. Tynkina, Issledovaniya po korrozii metallov (Tr. In-ta fiz. khimii AN SSSR) vyp. II, No. 1, Izd-vo AN SSSR, M., 1951), ensures an efficient protection of the surface of aluminum alloys not only from corrosion, but also from wear by friction and other erosive actions. The coatings are thermally stable, and provide an insulation against heat and electric current. A УЭМ-3 (UEM-3) electron

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Effect of conditions of ...

microscope was also used for certain examinations. The pictures were obtained in enlargements of 8000 to 12000. A maximum 60000-fold enlargement was obtained by further photographic enlargement. The specimens consisted of AB 000 (AV000) aluminum (99.99% Al) and were 15×15×2 mm in size. Prior to anodizing, the specimens were ground, polished with a fine aluminum oxide suspension, and degreased. The anodic oxidation took place in 4 N sulfuric acid at 0.5°C and at current densities of 25, 50, and 100 ma/cm^2, or initial voltages of 22, 25, and 27 v. The duration of oxidation was varied between a few seconds and 120 minutes. The microstructures of very thin and very thick coatings could thus be interconnected. During oxidation the electrolyte was vigorously intermixed in order to obtain more homogeneous coatings. The diameter of the pores of the coatings that were obtained was determined with the electron microscope. The number of pores per unit area of coating was established from the quantity of oxide cells per unit area. The very thin coatings (δ = 0.05-0.08μ) obtained in the initial stage of anodic oxidation were examined directly in the electron microscope after being detached from the aluminum surface in a sublimate solution. A copy was prepared of the thick coatings (δ =50-100μ) resulting from longer anodizing under the

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Effect of conditions of ...

same conditions. For this purpose, a very thin layer of collodion on quartz was applied to the surface of oxidized aluminum, which took up the relief of the oxide coating concerned. This copy was studied in the electron microscope. Results: The coatings submitted to investigation are no dense oxide layers irregularly traversed by channel-shaped pores, but constitute dense packings of cells in the form of hexagonal prisms resting normally to the metal surface, and connected to one another at the side faces. These results were compared with the structures of coatings obtained under usual conditions of anodic oxidation in sulfuric acid. For this purpose, aluminum specimens were anodically oxidized at 20°C and a current density of 10 ma/cm^2, and an initial voltage of 10 v. The mean diameter of the pores in the coatings was found to be independent of the method of anodizing in sulfuric acid, and to amount to 120 A. It was established on the other hand that coatings produced by the above described method of hard anodizing exhibit basically new properties. They display a great hardness and stability against wear by friction. These improved properties are based upon an enlargement of oxide cell dimensions (by a thickening of the walls) and upon the reduction of the number of pores per unit area of the coating. The scientific workers of the

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22003
S/076/61/035/004/011/014
B106/B201

Effect of conditions of ...

laboratory for sorption processes at the authors' institute are thanked for their assistance, V. M. Luk'yanovich and Ye. A. Leont'yev for valuable advice. There are 8 figures, 1 table, and 10 references: 7 Soviet-bloc and 3 non-Soviet-bloc. The reference to the English language publication reads as follows: F. Keller, M. S. Hunter, D. Z. Robinson, J. Electrochem. Soc., 100, 411, 1953.

ASSOCIATION: Akademiya nauk SSSR Institut fizicheskoy khimii (Academy of Sciences USSR Institute of Physical Chemistry)

SUBMITTED: July 24, 1959

Card 4/5

Effect of conditions of ...

Fig. 3: Distribution curves of pores according to diameters, as obtained for thin (δ =0.08 μ) coatings by the electron microscope (after detaching films from aluminum surface in sublimate solution).
1) hard anodizing (i=25 ma/cm^2, E = 22 V, t = 0.5°);
2) ordinary anodizing (i = 10 ma/cm^2, E = 10 V, t = 20°C);
(a) pore diameter in A.

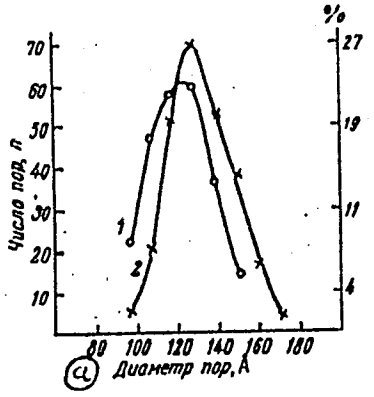

FIG 3

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9 (6)

AUTHORS: Zalivalov, F. P., Tyukina, M. N., Tomashov, N. D.

SOV/32-25-6-17/53

TITLE: Investigation of the Microstructure of Anodic Oxide Films on Aluminum by the Aid of the Electron Microscope (Issledovaniye mikrostruktury anodnykh okisnykh plenok na alyuminii pri pomoshchi elektronnogo mikroskopa)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 6, pp 696-698 (USSR)

ABSTRACT: A method was devised, permitting the determination of the cell structure of anodic oxide films on aluminum (Fig 1). By this method no impression is taken of the film on the metallic anode surface (Ref 1); instead, replicas are prepared of such films. The method is based on the operation of taking off and subsequently comminuting the oxide film, thus obtaining microscopic particles which are split along the side- (longitudinal section) or bottom- (cross section) plane of the hexagon lattice structure. Reproductions of these planes of shear may be obtained by the carbon-replica method (Ref 2). The preparation procedure is described. Observations were made with the electron microscope EM-3 or UEM-100, and the samples under investigation were of AV000 aluminum (99.99 % Al), which

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Investigation of the Microstructure of Anodic Oxide Films on Aluminum by the Aid of the Electron Microscope

SOV/32-25-6-17/53

were oxidized anodically in a 4 % sulphuric acid solution by the method of the hard anodization (Refs 3, 4) (Figs 2, 3). The figures show that the oxide film is a dense packing of cells in the form of hexagon prisms. Data are supplied of the dimension and quantity of cells (Table); they agree with data obtained with an earlier described method (Ref 1). There are 3 figures, 1 table, and 4 references, 2 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

Card 2/2

TYUKINA, M.N.; ZALIVALOV, F.P.; TOMASHOV, N.D.

Electron microscopy of the microstructure of anodic oxide films on aluminum. Trudy Inst.fiz.khim. no.7:165-174 '59. (MIRA 13:5)

(Electron microscopy)
(Aluminum coating)

PALEOLOG, Ye.N., kandidat khimicheskikh nauk, redaktor; ROZENFEL'D, I.L., doktor khimicheskikh nauk, redaktor; TYUKINA, M.N., kandidat khimicheskikh nauk, redaktor; TOMASHOV, N.D., professor doktor khimicheskikh nauk, redaktor; SHCHIGOLEV, P.V., kandidat khimicheskikh nauk, redaktor; BABICH, L.V., redaktor izdatel'stva; MAKUNI, Ye.V., tekhredaktor

[Problems of corrosion and the protection of metals; proceedings of the conference] Problemy korrozii i zashchity metallov; trudy soveshchaniia. Moskva, Izd-vo Akademii nauk SSSR, 1956. 270 p. (MLRA 9:8)

1. Vsesoyuznoye soveshchaniye po korrozii i zashchite metallov. 5th, Moscow, 1954.
(Corrosion and anticorrosives)

PALEOLOG, Ye.N., kandidat khimicheskikh nauk, redaktor; ROZENFEL'D, I.L., doktor khimicheskikh nauk, redaktor; TYUKINA, M.N., kandidat khimicheskikh nauk, redaktor; TOMASHOV, N.D., professor doktor khimicheskikh nauk, redaktor; SHCHIGOLEV, P.V., kandidat khimicheskikh nauk, redaktor; BABICH, L.V., redaktor izdatel'stva; MAKUNI, Ye.V., tekhredaktor

[Problems of corrosion and the protection of metals; proceedings of the conference] Problemy korrozii i zashchity metallov; trudy soveshchaniia. Moskva, Izd-vo Akademii nauk SSSR, 1956. 270 p. (MLRA 9:8)

1. Vsesoyuznoye soveshchaniye po korrozii i zashchite metallov. 5th, Moscow, 1954.
(Corrosion and anticorrosives)

TYUKINA, M.N.; TOMASHOV, N.D.

Electrochemical investigation of anodic films on aluminum. Trudy Inst.Fiz.Khim., Akad. Nauk S.S.S.R. 2, Issledovaniya po Korrozii Metal. No.1, 126-35 '51. (MLRA 4:10)
(CA 47 no.15:7346 '53)

TOMASHOV, N.D.; TYUKINA, M.N.

Anodic oxidation of aluminum in sulfuric acid. Trudy Inst.Fiz.Khim., Akad. Nauk S.S.S.R. 2, Issledovaniya po Korrozii Metal., No.1,110-25 '51. (MLRA 4:10)
(CA 47 no.15:7346 '53)

TOMASHOV, N.D.; TYUKINA, M.N.; BLINCHEVSKIY, G.K.

Apparatus for the relative estimation of the elasticity of anodic films of aluminum. Trudy Inst.Fiz.Khim., Akad. Nauk S.S.S.R. 3, Issledovaniya Korrozii Metal. No.2, 13-16 '51. (MLRA 5:2)
(CA 47 no.17:8559 '53)

TYUKINA, M. N.

Hygroscopicity of alcohol. P. S. Panyushin and M. N. Tyukina. *Collection Repts. Motor Fuel Research, U. S. S. R. Trans. Sci. Automobile-Tractor Inst.* Issue 21, 48-58(1931).--Ninety-six and 99.9% alc. and a mixt. of alc. and benzene (1:1) were exposed to 100 and 58% moist air in a specially constructed app. Aq. and 99.9% alcs. decrease in strength in the same way, represented by a straight line. The absorption of the moisture is almost directly proportional to the temp. The velocity of water absorption depends on the amt. of water vapor which diffuses in a time unit from the space above the container holding the alc. to the surface of the latter, and this amt. is inversely proportional to the distance of the liquid surface and the edges of the container. The velocity of the absorption of moisture depends upon the relative moisture of the air. The distribution of the moisture in the alc. is almost simultaneous. The amt. of water absorbed by the alc.-benzene mixt. in the time unit is not less than that absorbed by pure alc. A. A. Boehtlingk

TYUKINA, M. N.
G. V. AKIMOV, Zhur Ob Anim, 1942, 12, 433-447

TYUKINA, M. N.

"The mechanism of the anodic oxydation of aluminium in sulphuric acid." Akomow, G. V., Tomashow, N. L., and Tyukina, M. N. (p. 447)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1942, Vol 12, No 9-10.

TYUKINA, M. N.
I. V. AKIMOV, Zhur Ob Khim, 1942, 12, 566-584

TYUKINA, M.N.,
C. V. AKIMOV, ZhOKh 12, 568-84 (1942)

ZALIVALOV, F.P.; TYUKINA, M.N.; TOMASHOV, N.D. (Moskva)

Effect of electrolysis conditions on the formation and growth of anodic oxide films on aluminum. Zhur. fiz. khim. 35 no. 4:879-886 Ap '61. (MIRA 14:5)

1. AN SSSR, Institut fizicheskoy khimii.
(Electrolysis) (Metallic oxides) (Aluminum)

ZALIVALOV, F.P.; TYUKINA, M.N.; IGNATOV, N.N.

Deep anodizing of aluminum molds. Lit. proizv. no.12:11 D '61.
(MIRA 14:12)

(Molding (Founding))
(Aluminum coating)

S/081/62/000/013/024/054
B177/B101

AUTHORS: Matveyeva, T. V., Tyukina, M. P., Pavlova, V. A., Tomashov, N. D.

TITLE: Research on the anodizing of titanium in sulfuric acid solutions

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 13, 1962, 410, abstract 13K166 (Sb. "Titan i yego splavy". no. 6. M., AN SSSR, 1961, 211-220)

TEXT: Research into a process of anodizing Ti is described. The composition (in %) tested was Fe 0.13; Ni 0.15; Si 0.17; C 0.05; N_2 0.098, Cu0.34; with Ti forming the remainder in solutions of H_2SO_4. The authors studied the growth and properties of the films in relation to the time of anodizing (up to 8 hours); D_a (1-10 a/dm^2); temperature (20-100°C) and concentration of H_2SO_4 (0-80 %). Anodizing of Ti in H_2SO_4 at about 20°C occurs at a high terminal voltage (up to 100 v) and results

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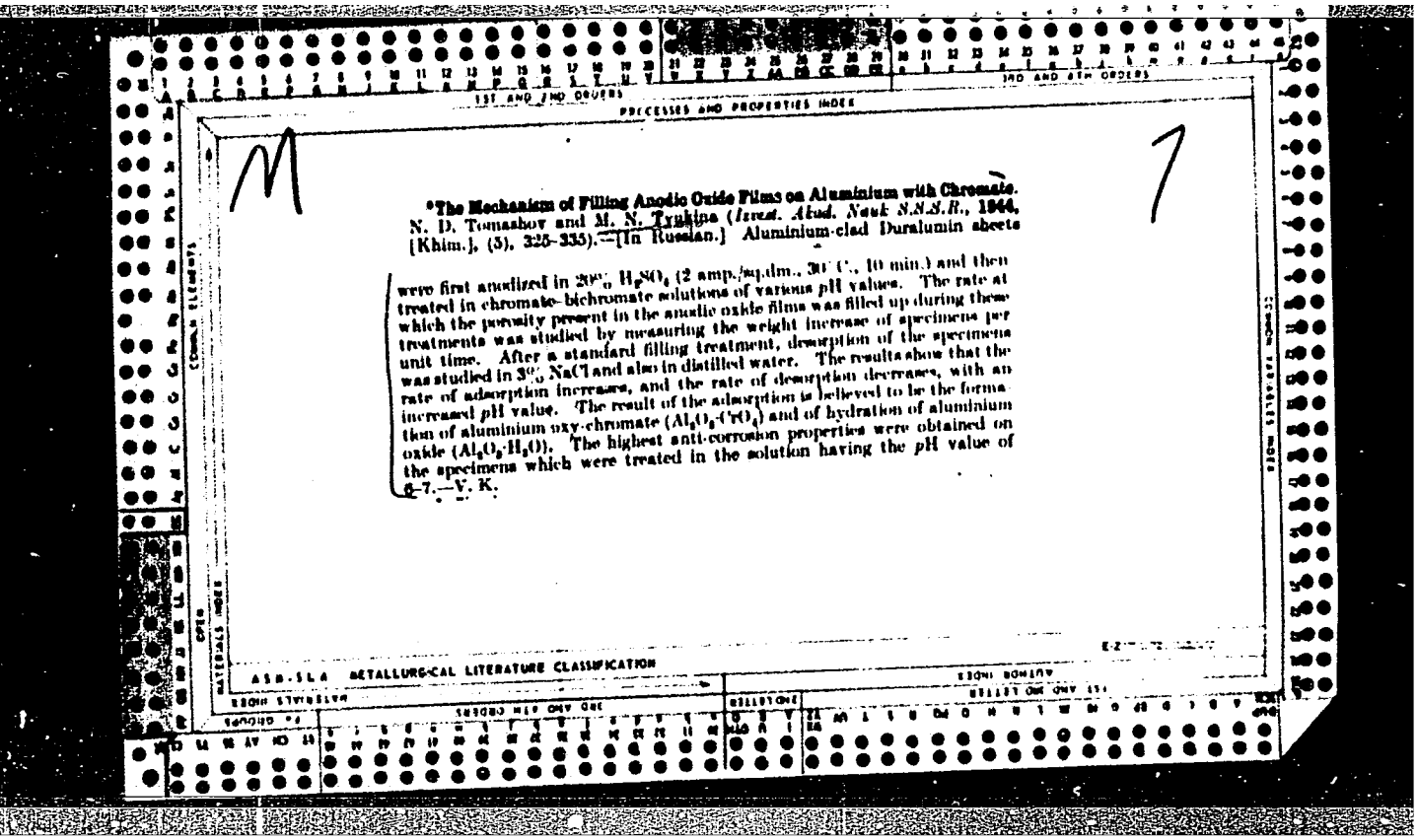
B177/B101

Research on the anodizing of...

in films of poor quality. Raising the temperature to not less than 80°C reduces the terminal voltage and makes it possible to get films with better protective properties. The following optimum methods of anodizing Ti are recommended. I. 18 % solution of H_2SO_4; 80°C; D_a 0.5 a/dm^2; time 2-8 hours. II. 18 % solution of H_2SO_4; 100°C; D_a 2 a/dm^2; time 2 hours.

[Abstracter's note: Complete translation.]

Card 2/2



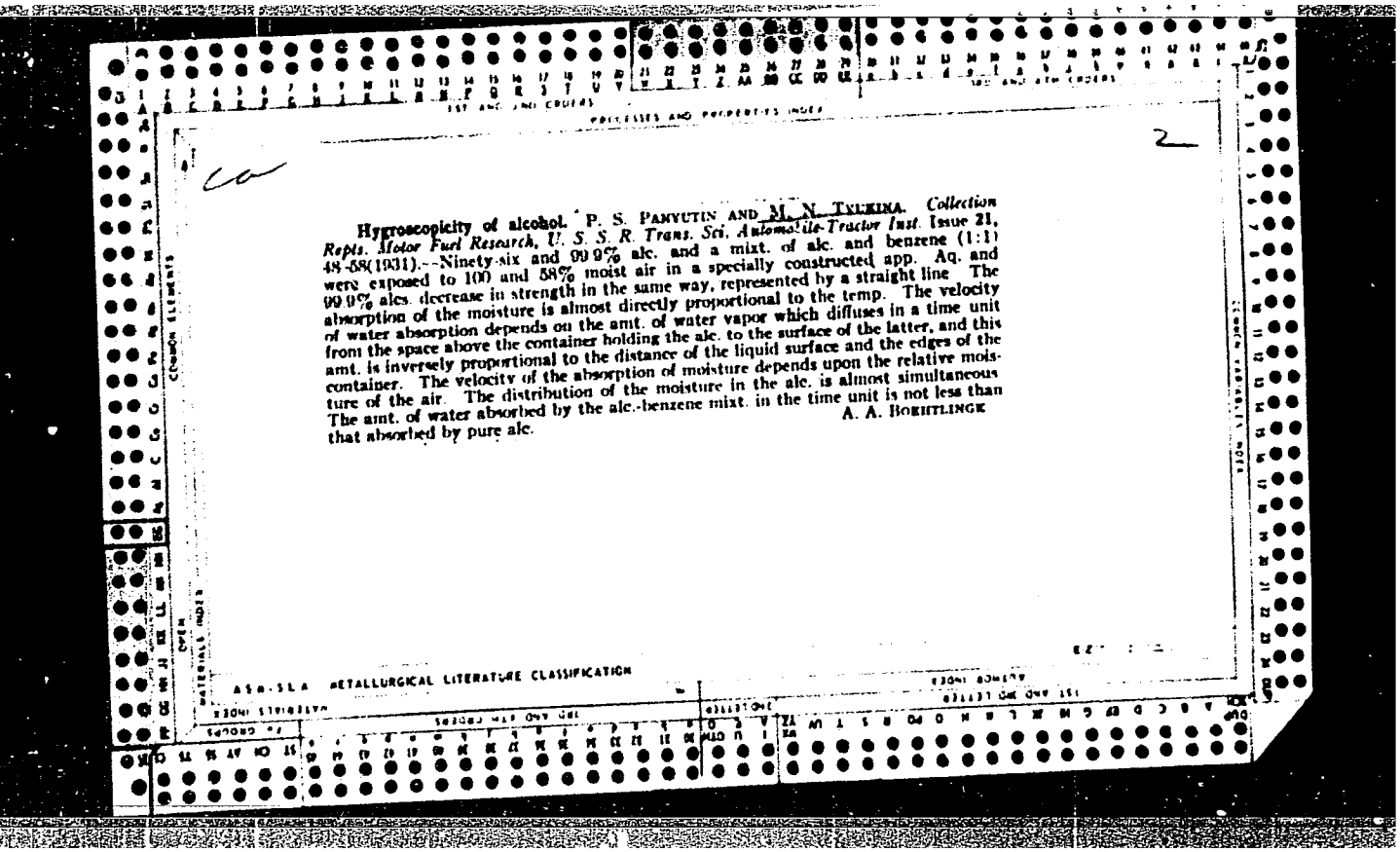
PROCESSES AND PROPERTIES INDEX

M

7

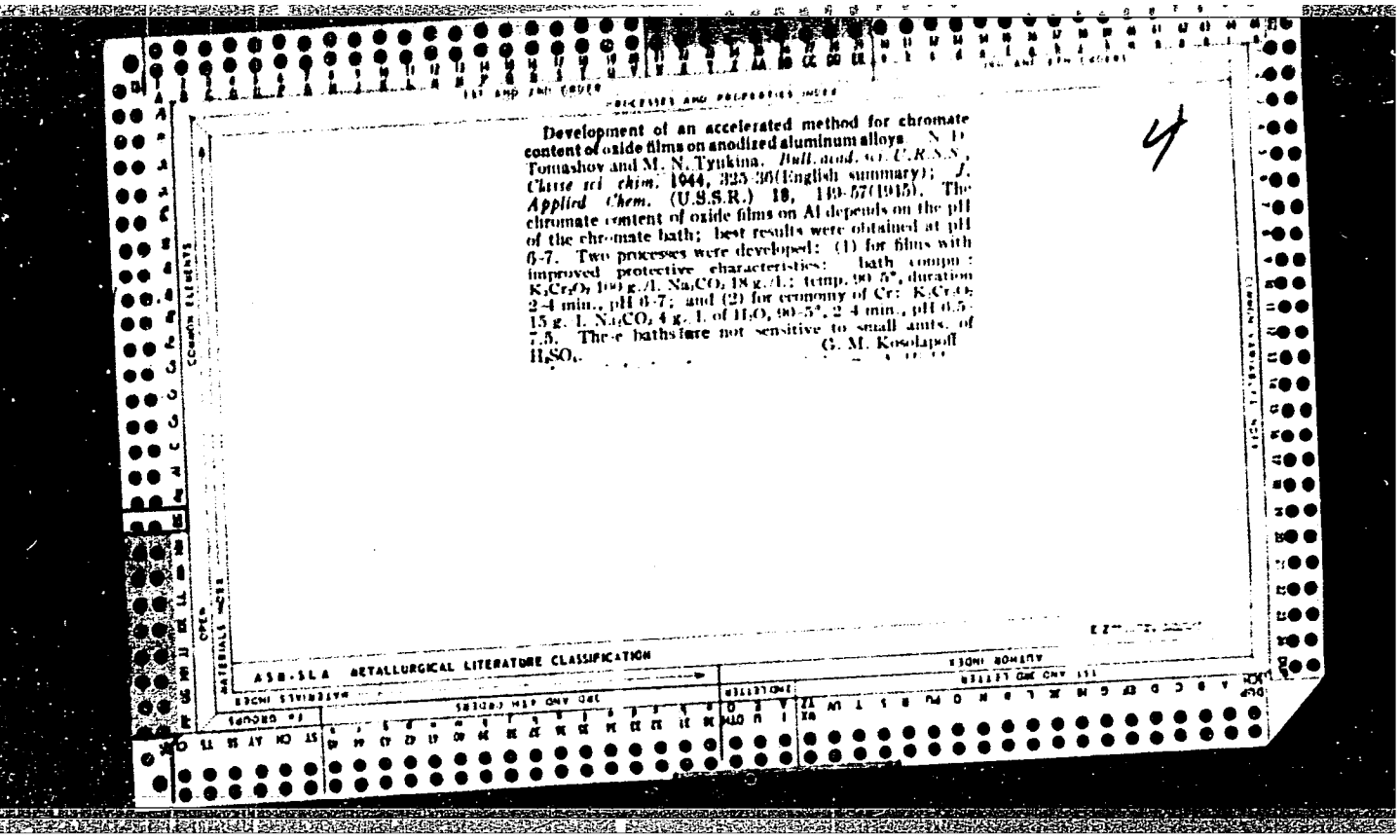
The Mechanism of Filling Anodic Oxide Films on Aluminium with Chromate. N. D. Tomashov and M. N. Tyukina (*Izvest. Akad. Nauk S.S.S.R.*, **1944**, [Khim.], (5), 325–335).—[In Russian.] Aluminium-clad Duralumin sheets were first anodized in 20% H_2SO_4 (2 amp./sq.dm., 30° C., 10 min.) and then treated in chromate–bichromate solutions of various *p*H values. The rate at which the porosity present in the anodic oxide films was filled up during these treatments was studied by measuring the weight increase of specimens per unit time. After a standard filling treatment, desorption of the specimens was studied in 3% NaCl and also in distilled water. The results show that the rate of adsorption increases, and the rate of desorption decreases, with an increased *p*H value. The result of the adsorption is believed to be the formation of aluminium oxy-chromate ($Al_2O_3 \cdot CrO_4$) and of hydration of aluminium oxide ($Al_2O_3 \cdot H_2O$). The highest anti-corrosion properties were obtained on the specimens which were treated in the solution having the *p*H value of 6–7.—V. K.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Hygroscopicity of alcohol. P. S. PANYUTIN AND M. N. TYLKINA. *Collection Repts. Motor Fuel Research, U. S. S. R. Trans. Sci. Automobile-Tractor Inst.* Issue 21, 48-58(1931).--Ninety-six and 99.9% alc. and a mixt. of alc. and benzene (1:1) were exposed to 100 and 58% moist air in a specially constructed app. Aq. and 99.9% alcs. decrease in strength in the same way, represented by a straight line. The absorption of the moisture is almost directly proportional to the temp. The velocity of water absorption depends on the amt. of water vapor which diffuses in a time unit from the space above the container holding the alc. to the surface of the latter, and this amt. is inversely proportional to the distance of the liquid surface and the edges of the container. The velocity of the absorption of moisture depends upon the relative moisture of the air. The distribution of the moisture in the alc. is almost simultaneous. The amt. of water absorbed by the alc.-benzene mixt. in the time unit is not less than that absorbed by pure alc.

A. A. BOGITLINGK



Development of an accelerated method for chromate content of oxide films on anodized aluminum alloys. N. D. Tomashov and M. N. Tyukina. *Bull. acad. sci. U.R.S.S., Classe sci. chim.* 1944, 325-30 (English summary); *J. Applied Chem.* (U.S.S.R.) 18, 149-57 (1945). The chromate content of oxide films on Al depends on the pH of the chromate bath; best results were obtained at pH 6-7. Two processes were developed: (1) for films with improved protective characteristics: bath composition $K_2Cr_2O_7$ 100 g./l., Na_2CO_3 18 g./l.; temp. 90-5°, duration 2-4 min., pH 6-7; and (2) for economy of Cr: $K_2Cr_2O_7$ 15 g./l., Na_2CO_3 4 g./l. of H_2O, 90-5°, 2-4 min., pH 6.5-7.5. These baths are not sensitive to small amts. of H_2SO_4.

G. M. Kosolapoff

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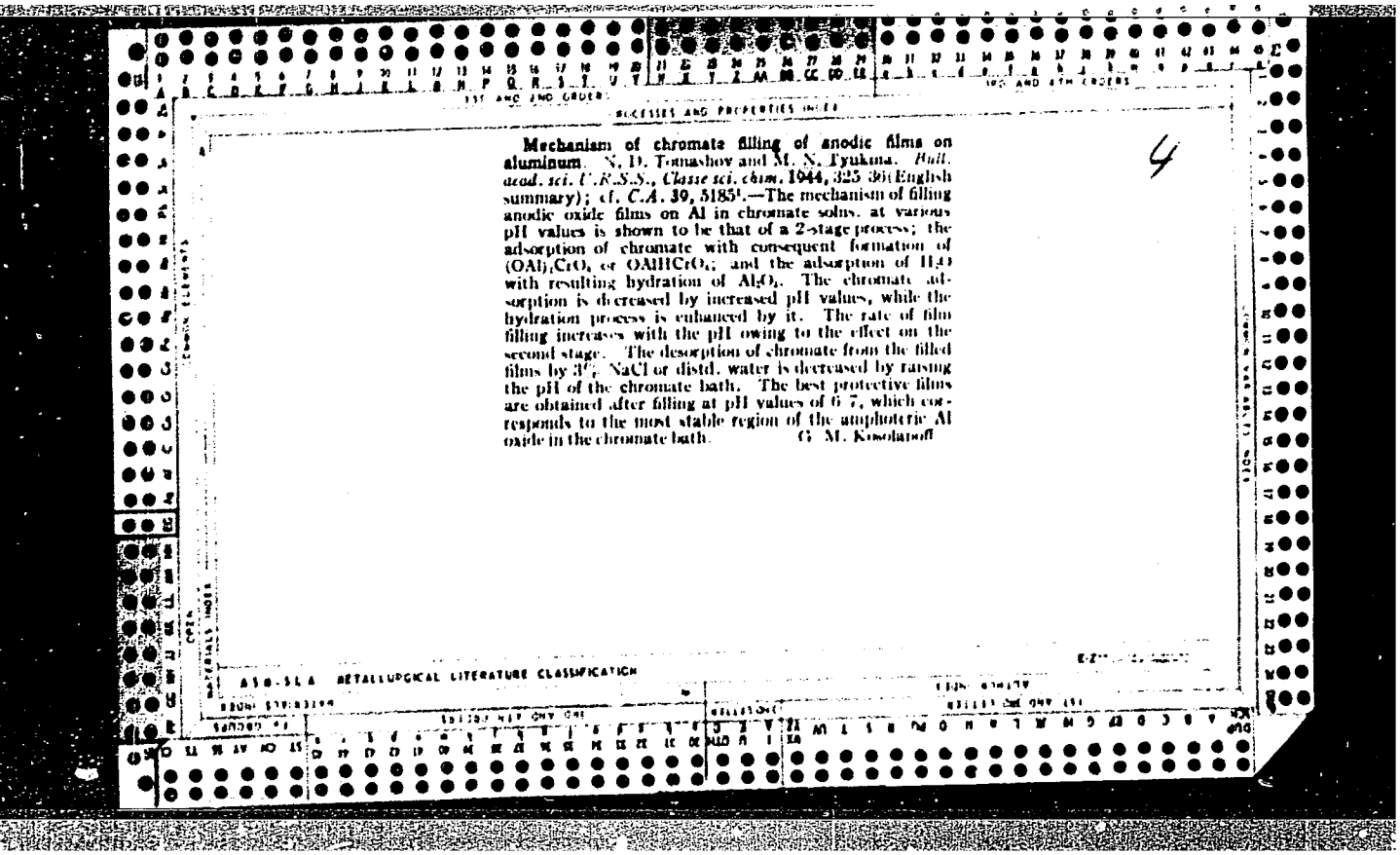

Mechanism of chromate filling of anodic films on aluminum. N. D. Tomashov and M. N. Tyukina. *Bull. acad. sci. U.R.S.S., Classe sci. chim.* 1944, 325-36 (English summary); cf. *C.A.* **39**, 5185[1].—The mechanism of filling anodic oxide films on Al in chromate solns. at various pH values is shown to be that of a 2-stage process; the adsorption of chromate with consequent formation of $(OAl)_2CrO_4$ or $OAlHCrO_4$; and the adsorption of H_2O with resulting hydration of Al_2O_3. The chromate adsorption is decreased by increased pH values, while the hydration process is enhanced by it. The rate of film filling increases with the pH owing to the effect on the second stage. The desorption of chromate from the filled films by 3% NaCl or distd. water is decreased by raising the pH of the chromate bath. The best protective films are obtained after filling at pH values of 6-7, which corresponds to the most stable region of the amphoteric Al oxide in the chromate bath. G. M. Kosolapoff

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1. Chaban kolkhoza "Put' Il'icha," Alekseyevskogo rayona (for Stepanov).

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