NOVIKOV, N.A.; DEMINA, N.V.

Method for quickly determining the degree of moisture in synthetic fibers. Tekst.prom.15 no.10:47-48 O'55. (MLRA 9:12)
(Textile fibers, Synthetic--Testing)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001137430007-5"

NOVIKOV, N.A.; ROMANOVA, L.S.

Determining the density of rayon wound on bobbins. Tekst. prom. 18 no.11:49-51 N '58. (MIRA 11:12)

(Rayon spinning)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001137430007-5"

KATORZHNOV, N.D.; PROKOF'YEVA, A.S.; KUPINSKIY, R.V.; SHISHKIN, P.M.
DVORNITSKIY, G.S.; NOVIKOV, N.A.

Technological layout for the continuous production line of capron staple fiber. Khim.volok. no.3:11-15 '59. (MIRA 12:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna (VNIIV).
(Nylon)

NEMCHENKO, E.A.; NOVIKOV, N.A.

Evaluating the strength of textile materials in stretching.
Khim.volok. no.5:63-67 '59. (MIRA 13:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna (VNIIV).
(Textile fibers, Synthetic--Testing)

NOVIKOV, N.A.

Effect of an irregularity of number, of the breaking load, and of the elongation at break of single viscose filaments on the breaking length of yarn. Khim. volok. no. 6:43-48 '60. (MIRA 13:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.

(Rayon--Testing)

NOVIKOV, N.A.; FEDOROVA, Ye.F.

Determining the density of thread winding on bobbins. Standartizatsiia 24 no.11:27-28 N '60. (MIRA 13:11)
(Bobbins (Textile machinery))

NOVIKOV, N.A.; TEL'NOVA, V.M.; GENTS, I.P., FEDOROVA, Ye.F.

Boxes for the transportation of artificial silk. Standartizatsiia 25 no.2:48-49 F '61. (MIRA 14:3)

(Boxes—Standards)

[illegible], A.[illegible]; [illegible]; NOVIKOV, N.A.; [illegible], V.[illegible]; RUPINSKIY, R.V.; [illegible]

[illegible] deaeration [illegible]. Khim. [illegible] (MIRA 18:[illegible])

[illegible] institut iskusstvennogo [illegible], [illegible]). [illegible] Gosudarstven- [illegible] iskusstvennogo volokna [illegible] (for Markov, Nivin).

L 10409-66 EWT(m)/EWP(j)/T RM UR

ACC NR: AM5013297 BOOK EXPLOITATION

Demina, Natal'ya Vasil'yevna; Motorina, Aleksandra Vasil'yevna; Novikov, Nikolay Alekseyevich (Candidate of Technical Sciences); Novikova, Sof'ya Aleksandrovna; Nemchenko, Eleonora Adol'fovna (Candidate of Technical Sciences); Panfilova, Mariya Mikhaylovna; Rogovina, Alisa Aleksandrovna (Candidate of Technical Sciences); Romanova, Lyubov' Stepanovna

Physicomechanical testing methods for chemical fibers, filaments, and films (Metody fizikomekhanicheskikh ispytaniy khimicheskikh volokon, nitey i plenok), Moscow, Izd-vo "Legkaya industriya," 1964, 352 p. illus., tables, fold chart, plates, biblio., appen. 2,300 copies printed.

TOPIC TAGS: test instrumentation, test method, cellulose fiber, synthetic fiber, cellulose plastic, textile engineering, mechanical engineering

PURPOSE AND COVERAGE: Instruments and procedures used in the physicochemical testing of chemical fibers are described. A description of the test methods for staple fibers, filament yarn, and cellophane is given. The book is intended for workers dealing with fiber and film testing in the chemical fiber and textile industries.

TABLE OF CONTENTS [abridged]:

UDC: [677-14+678-416]:620.1

Card 1/2

L 10409-66

ACC NR: AM5013297

SUBMITTED: 24Nov64 SUB CODE: OC, MT NO REF SOV: 044

OTHER: 002

Card 2/2

SKRYNCHENKO, D.A.; SHUMILOV, K.A.; NOVIKOV, N.A.

Automatic cast-iron weight control unit in the charging boxes of a casting machine. Avtom. i prib. no. 1:15-18 Ja-Mr '64. (MIRA 17:5)

D...IN.., Natal'ya ...'yevna; ..., A...andra ...'yevna; ..., Nikolay Alekse.evich, kand.tekhn.nauk; ...NOVIKOVA, Sof'ya Alek...dr.vna; ..., ...ra Adol'...ovna, kand. tekhn. nauk; ..., ..a..iya Mikhaylovna; ..., Alisa Aleksan..rovna, kand. tekhn. nauk; ..., Lyubov' Stepanovna; ..., ..., kand. tekhn. nauk, retsenzent; ..., Ye...., red.

[Methods of ... testing of synthetic fibers, threads and films] Metody fiziko-mekhanicheskikh ispytanii kh..micheskikh volokon, nitei i plenok. Moskva, Legkaia industriia, 19... 3... p. (MIRA ...)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennykh volokon (for ...).

NOVIKOV, N. G.

USSR/Metals - Steel, Casting

Oct 51

"Casting Parts of the Low-Pressure Cylinder for a Steam Turbine," I. G. Bugay, V. G. Gruzin, Cand Tech Sci, N. G. Novikov, A. F. Netyazhenko, V. N. Saveyko, Engineer TsNILTMASH

"Litey Proizvod" No 10, pp 2-6

Low-pressure cylinder is composed of sep cast parts, casing of which represents long, complex and labor-cons.ming process. Some of these parts weigh up to 8,340 kg and require 12,540 kg of liq id metal. Describes technological process of manufg upper right and lower left parts of casting.

198T63

Andrianov, K.A.

AUTHORS: Andrianov, K.A. (Corresponding Member of the Acad. of Sci. of the USSR), Novikov, N.G. (Engineer), and Larkin, Ye.P. (Engineer). 110-7-11/30

TITLE: Heat resisting electrically insulating cylinders and tubes for dry transformers. (Teplostoykiye elektroizolyatsionnye tsilindrye i trubki dlya sukhikh transformatorov).

PERIODICAL: "Vestnik Elektropromyshlennosti" (Journal of the Electrical Industry), Vol.28, No.7, 1957, pp.38-42 (USSR).

ABSTRACT: It is important to produce heat resisting explosion proof dry transformers for the coal industry because they can be installed much nearer the coal face than can flame-proof oil-filled transformers. For the manufacture of such transformers it is important to have insulating cylinders and tubes capable of operating at high temperatures and voltages. This article describes briefly experimental data on the production and study of heat-stable glass-fabric cylinders and tubes based on silicone resins. Polyphenyl-methyl-siloxane resin of high thermal and water resistance and satisfactory binding properties for glass cloth was manufactured on a semi-industrial scale. This resin was introduced into production at the Kuskovsk Chemical works under the brand Varnish K-41, which was later

Card 1/3

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001137430007-5"

modified by poly-ether Г-4 and used for the impregnation of glass-cloth used in the manufacture of wound glass-cloth products. The technology of production of cylinders and tubes from this material is then described briefly.

Figs.1, 2 and 3 show the changes in the dielectric properties of these cylinders as a function of the time of wetting, and Fig.4 the change in capacitance of the cylinder with the time of wetting. The cylinder with a wall thickness of 5 mm was placed in water and kept there for 41 hours (after it had been first exposed to a humid atmosphere). Its loss angle did not change. It withstood a voltage of 30 kV for 5 minutes. It was then heated for two hours at 200 C and was tested at 30 kV for five minutes at this temperature. Further increase in the voltage to 47 kV caused breakdown.

Glass-cloth cylinders were tested both in the initial condition and after ageing at temperatures up to 220 C. The results of the tests are given in Tables 1, 2 and 3. Samples 1 and 2 withstood a test voltage of 20 and 40 kV after ageing for 2000 hours in the dry condition and after

Heat resisting electrically insulating cylinders and tubes for dry transformers. (Cont.) 110-7-11/30

wetting for three days. Table 2 gives the results of tests on cylinders after maintaining for a long time at a temperature of 200 C with periodic wetting. Table 3 gives results of tests on glass cloth cylinders after periodic heating to a temperature of 220 C and exposure to a medium of relative humidity of 98%. All the cylinders withstood the test voltages of 20 and 40 KV before and after wetting and after ageing for times up to 500 hours. Table 4 gives the results of tests on the dielectric properties of glass-cloth cylinders used as the main insulators in a dry type mining transformer. A dry type transformer, TCШB-180/6, of 180 kVA, 6000 V + 5% was made. During the process of testing, this transformer was often overloaded two or three-fold in respect of current and to double output. In these difficult conditions the transformer continued in experimental service. This transformer should, therefore, be very valuable and reliable under the difficult conditions encountered in mines. There are 4 figures, 4 tables, 5 foreign references.

Card 3/3

ASSOCIATION: All-Union Electrotechnical Institute. (VEI).
AVAILABLE:

MAKAREVICH, B.K., kand.tekhn.nauk, NOVIKOV, N.I., inzh.

Remote optical measurements of large parts. Vzaim.i tekh.izm v mashinostr.;mezhvus.sbor.no.2:339-350 '60. (MIRA 13:8)
(Optical measurements)

AUTHOR

TITLE

PERIODICAL

TEXT

Angle meter [illegible]

The meter is [illegible] [illegible] two [illegible] [illegible] with two [illegible] measured with [illegible] and one [illegible] a [illegible] with [illegible] angle meters [illegible] then the tape [illegible] ends, and the [illegible] meters [illegible] difference [illegible] are added and used [illegible] is aimed on the mi[illegible] the cross on the [illegible] the mirror. The same [illegible] tables to eliminate [illegible] are to be used: 1) [illegible] angle meters, using [illegible]

Card 2/4

2) For the thickness of the measuring tape, for the length of the top layers of the tape material changes in bending (it equals the tape thickness, and can be included in tables). 3) For thermal expansion. In the case of equal expansion of the factor of the tape and part the formula is

$$\Delta D_t = D_{meas} \Delta t \qquad (4)$$

where $\Delta t = 20^{\circ}C - t$; or, in general case, i.e., when $\alpha_D \neq \alpha_{L_0}$:

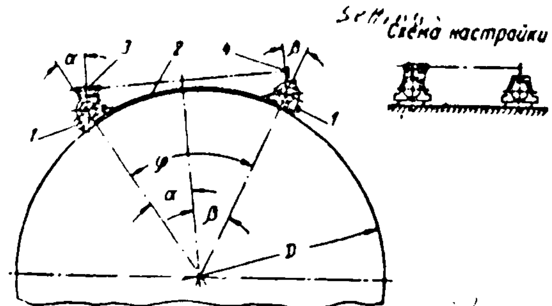
$$\Delta D_t = D_{meas} \Delta t \frac{\alpha_D - \alpha_{L_0}}{1 + \alpha_D \Delta t} . \qquad (5)$$

The best tape material is 65Г (65G) steel. The main component in the limit error (in microns, determined for diameters from 1,000 to 5,000 mm) is proven to be originated from the determination of the central angle (φ). The error from the tape length is small, for the length can be determined with an accuracy to 5 - 20 micron. Conclusions: The method is applicable for class 2a accuracy measurements for diameters up to 2,500 mm, and class 3 for 2,500 - 5,000 mm, provided that the error does not exceed 1/3 of the tolerance. The meter has been tested at Elektrostal'skiy zavod tyazhelogo mashinostroyeniya (Elektrostal' Heavy Machine Building

Angle-arc meter for measuring the external... S/122/60/000/002/013/018
A161/A130

Plant). The limit error on 1,000 mm diameter (at L_o = 600 mm) was Δ_{lim} = 0.06 mm, and on 2,000 mm diameter (at L_o = 1,200 mm) was Δ_{lim} = 0.150 mm. It was stated that a longer tape increases the measurement accuracy, and that the major source of the tooling errors is the joint of the flexible tape with the angle meter. The symmetry of the support points to the angle meter rotation axis must be improved. The limit errors exceeding the theoretical are explained by the inaccuracy of the experimental "UDP" unit. The tooling inaccuracies can be eliminated by precision in manufacturing of the mechanical elements. There are 6 figures and 3 tables.

Fig. 2.



Card 4/4

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001137430007-5"

23465

S/115/61/000/006/001/006
E073/E535

19600 also 2908

AUTHORS: Novikov, N.I. and Makarevich, B.K.

TITLE: Automatic Measurement of the Dimensions During Turning

PERIODICAL: Izmeritel'naya tekhnika, 1961, No.6, pp.5-6

TEXT: In TsNIITMASh a new device was developed for measuring the external diameters of components being machined (Engineers A. Ya. Peliks and E. L. Abramzon participated in the development work). A roller 1 (Fig.1) containing an inductive pick-up is pressed onto and driven by the component being machined 2, the diameter of which is to be measured. The roller is fixed onto the rear tool-rest 3 of the lathe and is made to approach the component to be measured by rotating the worm of the tool-rest. The pressure applied to the roller is controlled by means of a spring. Rotation of the roller generates in the sensor a.c. signals of a frequency depending on the frequency of rotation of the component, the diameter of the roller and the number of teeth of the inductive pick-up. These signals are converted into short duration voltage pulses which are fed into a pulse counter. The phase state of the signal changes during each revolution a

Card 1/4

23465

certain number of times in strict relation to the angle of rotation of the sensor. The revolution marker 4 emits command signals for starting and stopping the pulse counting. It consists of two coils with a permanent magnet, the magnetic circuit of which is closed by means of a cross-piece fitted onto the chuck of the machine tool. The cross-piece rotates together with the spindle and closes the magnetic circuit during each revolution. On closing the magnetic circuit a signal appears in the coil; this is transformed into a short duration pulse which is fed to the pulse counting circuit. The revolution marker gives one signal for each full revolution of the machined part. The sensor (Fig.2) consists of two toothed rims 1 and 2 which are able to rotate independently of each other. In a П-shaped slot of the rim 2 a coil 3 is placed which is fed by direct current. The shaft 4 is hollow to allow for passage of the leads of the coil. The larger the diameter of the component the larger w[illegible]l be the angle by which the sensor will turn for a predetermin[illegible] number of revolutions of the component and the larger will be t[illegible] number of signals generated and counted. The equipment

23465

Automatic Measurement of the ... S/115/61/000/006/001/006
E073/E535

is capable of generating 840 signals per revolution for a roller diameter of 210 mm. Experiments for determining the influence of speed of cutting on the accuracy were carried out at speeds of 20-250 m/min and these have shown that the scatter in the results does not exceed 0.03 mm for a roll pressure of 70 kg. The surface roughness of the components was within the limits of 10 to 80 μ. Use of cutting fluids had no influence on the accuracy. The experiments were carried out on a lathe with a centre height of 500 mm. Random errors are within the normal Gauss distribution, the mean square deviations being 21 μ. There are 2 figures.

Card 3/4

23465

Automatic Measurement of the ... S/115/61/000/006/001/006
E073/E535

Fig.1

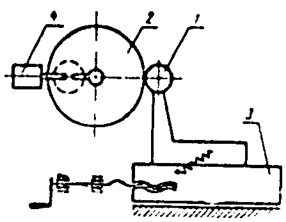
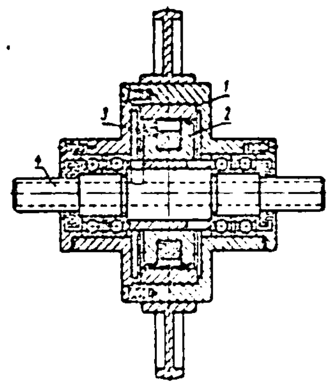


Fig.2



Card 4/4

NOVIKOV, N.I.; SAPOZHKOV, A.I.

Noncontact optical devices for measuring diameters of large parts. Izm tekh. no.9:8-9 S '61. (MIRA 14:8)
(Optical instruments)

S/590/61/10?/000/00?/??
D040/D113

AUTHOR: Novikov, N.I., Engineer

TITLE: Angle-ar meter (UDP) for measuring the external diameter of large parts

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut tekhn... i mashinostroyeniya. [Trudy] v. 10?, 1961. Issledovaniye tekhnologicheskikh protsessov v tyazhelom mashinostroyenii, ... 39.

TEXT: The described УДП (UDP) ... device developed by the laboratory ... of TsNIITMASh ... for measuring external diameters of 1000mm and upwards and consists of two У-1 (U-1) inclinometers with ... and a flexible band connecting them. The measuring ... based on the geometric axiom that the radius of a circle is equal to the relation of the arc to the central angle resting on the arc, and the diameter is determined using the formula

$$D = \frac{2L_0}{\rho}, \qquad (1)$$

Card 1/4

where L is the length of arc in mm, and φ is the central angle in radians (Fig.1). The UDP is designed for measuring parts in the horizontal [illegible] and can be used for parts of up to 5000 mm diameter on a machine [illegible] practically any diameter if not measured on machine tools. The [illegible] system (Author's Certificate no. [illegible]) is described. The starting [illegible] for measurement can be fixed by different methods. Fig.1 shows fixation [illegible] in the inclinometers. Fixation by autocollimation (Fig.2) makes the system more sensitive. The arc is measured with the flexible band with [illegible] [illegible] ends. The distance between the balls is very accurately [illegible]. The meter has been tested at the Permskiy mashinostroitel'nyy [illegible] (Perm' Machine-Building Plant) and at the Uralmashzavod. The [illegible] [illegible] calculations of corrections, and recommendations [illegible] the band material and dimensions. Conclusions: (1) The [illegible] suitable for [illegible] measurements with class 3-4 accuracy. Vibration [illegible] of [illegible] machines has no noticeable effect on the accuracy of measurement. [illegible] The theoretical axiom that accuracy increases with increasing length of the flexible band is fully confirmed. A flexible band approximately [illegible] [illegible] of the measured part should be used. (3) [illegible]

S/590/61/102/000/005/005
D040/D113

Angle arc-meter ...

has very little effect on the measuring accuracy. (4) The major cause of errors is the connection of the flexible band with the inclinometers. The accuracy can be improved by further improvement of the design and the measurement method. There are 6 figures and 3 tables.

Card 3/4

S/590/61/102/000/005/005
D04?/D113

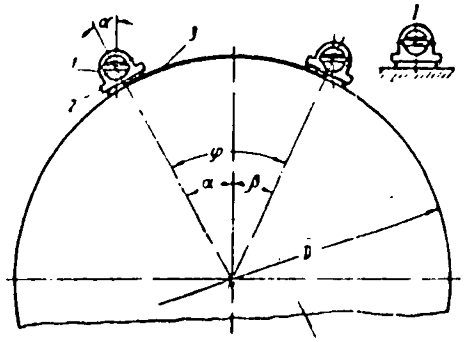


Fig.1. Measuring with the UDP (with levels for fixing the starting point): 1 - level; 2 - inclinometer; 3 - flexible band; I - Inclinometer setting for the start position.

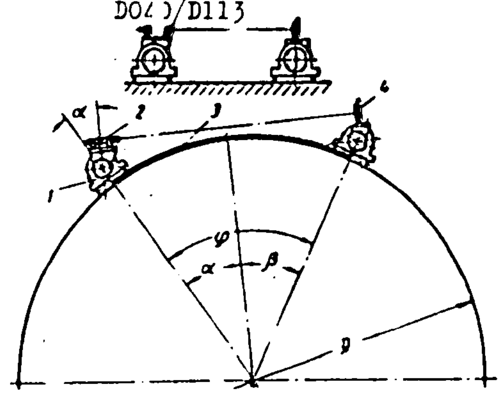


Fig.2. Measuring with an auto-collimation system for fixing the starting point:
1 - inclinometer; 2-autocollimator;
3 - flexible band;4- mirror;
I - setting.

S/122/62/000/004/005/006
D221/D302

AUTHORS: Makarevich, B.K., Candidate of Technical Sciences, Novikov, N.I., Peliks, A.Ya., Abramzon, E.L., and Sapozhkov, A.I., Engineers

TITLE: A device for automatic measurement of diameters on lathes

PERIODICAL: Vestnik mashinostroyeniya, no. 4, 1962, 73 - 77

TEXT: The investigations of ENIMS revealed that over 25 % of the auxiliary time is taken up by measurements. The device designed by TsNIITMASh uses a burnishing roller with an inductive transducer and a contactless revolution counter for the automatic measurement of components during their machining on lathes. This principle does not require additional setting when changing from one diameter to another. The rotor and stator are toothed, and the inductivity of the coil varies with the relative change of position between the teeth and cavities of the former. The shaft of the unit carries a wheel, which is brought into contact with the workpiece, so that their ratio determines the speed of rotation of the rotor. The out-
Card 1/2

put of the transducer forms a sine wave counted by an electronic device. The linear expression of the pulse is A = d/nz, where d is the diameter of the burnishing roller in mm, n is the r.p.m. of the workpiece and z is the number of pulses per one revolution of the roller. The experiments at various speeds of turning indicate that stable results are ensured with a pressure of 70 - 80 kg. The effect of surface finish on the accuracy of measurements is shown by deviations of 0.03 - 0.04 mm. Random errors follow the Gaussian distribution. The transducer is connected to a bridge. The electronic circuit is described and illustrated, together with the transducer. The authors analyze the various errors which arise in the arrangement and indicate the total error without considering inaccuracies due to temperature. The device allows a 60 - 80 % reduction of the auxiliary time to be achieved. Use of the indicated pressure of the roller against the workpiece demonstrates a negligibly small slip, and thus has no effect on the readings. There are 8 figures and 4 Soviet-bloc references.

[illegible]

NOVIKOV, N. I.

NOVIKOV, N. I. -- "The Problem of Synthesizing Tertiary Alcohols Based on Camphor." Min Higher Education USSR. Molotov State U imeni A. M. Gor'kiy. Molotov, 1955. (Dissertation for the Degree of Candidate of Chemical Sciences.)

SO: Knizhnaya Letopis', No 5, Moscow, Feb 1956

NOVIKOV, N. I

2

Chem

Synthesis of tertiary alcohols based on camphor. II. V. I. Esafov and N. I. Novikov (State Univ., Sverdlovsk). *Zhur. Obshchei Khim.* 25, 2758-62(1956); cf. *C.A.* 44, 9945e.—It was shown that mixing the components in abs. Et_2O yielded the following complexes with camphor (I): 2I.EtOMgI, 2I.$MgBr_2$, 2I.MgI_2. I (0.05 mole) or 0.025 mole of its complexes with MgX_2 in Et_2O with 0.05 mole MeMgI after refluxing 18 hrs. gave the following yields of normal Grignard reaction product: 31.4% from I, 24.8% from 2I.$MgBr_2$, and 20.6% from 2I.MgI_2. A similar reaction with 2I.EtOMgI and EtMgBr gave 17.6% reduction product and 45.5% enolization product. Bromination in CCl_4 at 0° of the Grignard reaction mixts. was used to prove the normal reaction course. The reaction of I with EtMgBr in Et_2O gave in 12 hrs. 60.2 vol.-% C_2H_4 in the gaseous products, indicating that the conversion by reduction to borneol proceeded to the extent of 10.8%; the enolization reaction, estd. by the difference in gas vol. of total gas and C_2H_4, was 19.3%. The tertiary alkylborneols thus obtained were dehydrated with exceptional ease. III. *Ibid.* 2762-5.—EtMgBr or BuMgBr, filtered free of Mg in the absence of air (app. was shown), and camphor in Et_2O at −15° 4 days, with periodic release of accumulated gaseous products, followed by 16-25 days at room temp. gave reaction mixts. whose iodine no. was detd. and the products with the highest iodine numbers were used for isolation of tertiary alkylborneols. The crude products were pressed out at 150 kg./sq. cm. from a flannel filter to remove the solids and the liquid products freed of camphor by treatment with semicarbazide-HCl and NaOAc, the residues were treated with dil. $KMnO_4$ 50 hrs. and steam distd.

Eskalov, V. I. ...

Thus were isolated: 7% *tertiary ethylborneol*, b. 223° (decompn.), b_4 67°, d_{20} 0.9537, n_D^{20} 1.4815 (*phenylurethan*, m. 119°); 5% *tertiary butylborneol*, b_4 86°, d_{20} 0.9337, n_D^{20} 1.4796 (*phenylurethan*, m. 100–1°). *Tertiary methylborneol* formed a *phenylurethan*, m. 138–9° (cf. Sivkov and Matveeva, *C.A.* 30, 4000[4]).

O. M. Kosolapoff

YESAFOV, V.I.; NOVIKOV, N.I.

Synthesis of tertiary alcohols on the camphor base. Part 3. Zhur. ob. khim. 26 no.10:2762-2765 O '56. (MIRA 11:3)

1. Ural'skiy Gosudarstvennyy universitet.
(Alcohols) (Camphor)

KOSINSKAYA, N.S., doktor meditsinskikh nauk; MINYAYLO, Ye.V., vrach-rentgenolog; NOVIKOV, N.I., master-protezist.

Roentgenological examination method in prosthesis following amputation of the lower leg. Vest.rent.i rad. no.5:68-76 S-O '53. (MLRA 7:1)

1. Iz Leningradskogo nauchno-issledovatel'skogo instituta protezirovaniya (direktor - professor F.A.Kopylov).
(Amputation of leg) (Artificial limbs) (X-Rays)

137-58-5-8886D

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 5, p ?, USSR

AUTHOR: Novikov, N.

TITLE: An Investigation of the Physicochemical Properties of Electrolytes Employed in Industrial Aluminum Baths (Issledovaniye fiziko-khimicheskikh svoystv elektrolitov promyshlennykh alyuminiyevykh vann)

ABSTRACT: Bibliographic entry on the author's dissertation for the degree of Candidate of Technical Sciences, presented to the Mosk. in-t tsvetn. met. i zolota (Moscow Institute for Nonferrous Metals and Gold), Moscow, 1957

ASSOCIATION: Mosk. in-t tsvetn. met. i zolota (Moscow Institute for Nonferrous Metals and Gold) Moscow

Aluminum--Heating ... Electrolytes--Properties

Card 1/1

AUTHORS: Novikov, N.I. and Belyayev, A.I. 136-11-9/17

TITLE: Investigation of the Physico-chemical Properties of Electrolyte of Industrial Aluminum Electrolyzers (Issledovaniye fiziko-khimicheskikh svoystv elektrolitov promyshlennykh alyuminiyevykh elektrolizerov)

PERIODICAL: Tsvetnyye Metally, 1957, Nr.11, pp. 46 - 53 (USSR).

ABSTRACT: The authors describe their laboratory experiments on the melting points, density, viscosity and electrical conductivity of electrolytes taken directly from aluminium-production electrolysers chosen so as to cover the whole range of basicity encountered in practice. Palladium apparatus was found to be suitable for dealing with the fluoride and carbon-containing melts. Primary crystallization temperatures were measured for samples taken in the course of the period between two preparations of the bath, and the temperatures are related to the cryolite ratio (Fig.1). Densities were measured for each sample for a temperature range of 100 - 150 °C, starting from 7 °C above the crystallization point. Viscosities were determined by a rotating pendulum method for the same electrolytes and the same temperature ranges. The authors discuss their results with reference to electrolyser operation and design and suggest that they enable the unsatisfactory design practice of determining

Card 1/3

136-11-9/17

Investigation of the Physico-chemical Properties of Electrolytes of Industrial Aluminum Electrolyzers

the fall in potential in the electrolyte layer indirectly to be avoided since they provide quantitative values for the resistivity of commercial electrolytes as well as for the other properties.
There are 7 figures, 4 tables and 12 references, of which 9 are Russian and 3 English.

AVAILABLE: Library of Congress

1. Electrolytes-Properties-Analysis

GORODNICHEV, V.M., kand. tekhn. nauk; ANDREYEV, V.Ye.; KLADOV, G.M.; KUSHMET, V.G.; MELIKSETOV, S.S., retsenzent; NOVIKOV, N.I., retsenzent;

[Construction of buildings and other structures for coal mines] Stroitel'stvo zdanii i sooruzhenii ugol'nykh shakht. Moskva, Nedra, 1964. 207 p. (MIRA 18:7)

NOVIKOV, N. M.

Volga Valley - Viticulture

Viticulture in the Middle Volga Valley. Vin. SSSR. 12, no. 6, 1952.

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

1. NOVIKOV, N. M.

2. USSR (600)

4. Viticulture

7. Making trellis clamps. Vin. SSSR 13, No. 5, 1953.

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

L 44690-66 EWT(d)/EWT(m)/EEC(k)-2/T/FSS-2 DJ/WR

ACC NR: AP6005365 SOURCE CODE: UR/0413/66/000/001/0111/0111

AUTHORS: Krichever, S. S.; Novikov, N. M.; Shafir, S. N.

34
B

ORG: none

TITLE: Hydraulic tracking device, Class 42, No. 177695

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 1, 1966, 111

TOPIC TAGS: tracking equipment, hydraulic equipment

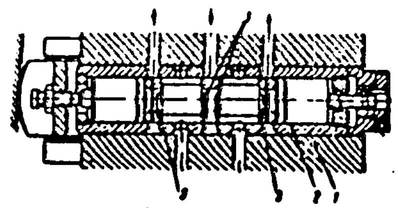
ABSTRACT: This Author Certificate presents a hydraulic tracking device made in the form of a casing with openings for allowing the working liquid to pass in and out. The casing contains an internal plunger with ports for passing the working liquid. To regulate the sensitivity and stability of the hydraulic tracking system by changing the amplification factor, the working head of the plunger is made in the form of two rectangular symmetrical ducts interacting with the corresponding rectangular ducts in the sleeve (see Fig. 1). The perimeter of the working aperture is adjusted by turning the plunger in respect to the sleeve.

L 44690-66

ACC NR: AP6005365

0

Fig. 1. 1 - casing of the instrument;
2 - plunger; 3 - duct



Orig. art. has: 1 figure.

SUB CODE: 13/ SUBM DATE: 11Mar63
17/

hs

Card 2/2

NOVIKOV, N.M.

Controlled development of seedlings. Vin.SSSR 15 no.3:43-47 '55.
(MLRA 8:8)

1. Khmelevskiy sovkhoz Glavnogo upravleniya vinodel'cheskoy promyshlennosti (RSFSR)
(Viticulture)

NOVIKOV, N.N.; GEPSHTEYN, Ye.M.; SEREBRYAKOVA, Ye.K.; GUREVICH, B.S.

Composition of coal tar from the coals of the Kuznetsk Basin. Koks i khim.no.8:36-40 '56. (MIRA 10:1)

1.Vostochnyy uglekhimicheskiy institut.
(Kuznetsk Basin--Coar tar)

LOGINOV, V.Ye.; NOVIKOV, N.N.

Method for reducing the film feed speed in the MPO-2 and N-102 oscillographs. Priborostroenie no.3:25 Mr '64. (MIRA 17:6)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001137430007-5"

AUTHOR: PODZEY, A.V., NOVIKOV, N.N., LOGINOV, V.Ye. 121-8-11/22

TITLE: The Determination of Heat Emitted to the Work Piece During Surface Grinding. (Opredeleniye tepla, vydelyayemogo v detal' pri ploskom shlifovanii.)

PERIODICAL: Stanki i Instrument, 1957, Vol. 28, Nr 8, pp. 33-34 (USSR)

ABSTRACT: The emission of heat from the grinding zone to the work piece depends on the thermo-physical parameters of the material: it is more intense in the case of high heat conductivity than in the case of low heat conductivity. In the first case this gives rise to inaccurate measuring and the shape of the worked surface, and in the second case it causes considerable temperature stress and structural changes of the surface layer. For the purpose of the exploration of internal stress and internal heat deformations the determination of the thermal field in the work piece is necessary which, at present, can only be brought about by means of the calorimetric method. Illustrations show such a calorimetric apparatus, which is described in detail and explained; formulae for the calculation of the work-piece are also given. The results of calorimetric experiments are given in a table, and another table shows the quantity of heat emitted to the work piece on the occasion of the grinding-off of 1 mm^3 of metal and for various grinding depths.

Card 1/2

PODZEY, A.V.; NOVIKOV, N.N.; LOGINOV, V.Ye.

Temperature field in metals subjected to surface grinding. Stan. i instr. 28 no.10:16-17 O '57. (MIRA 10:11)
(Grinding and polishing) (Heat transmission)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001137430007-5"

GERTSRIKEN, S.D. [Hertsriken, S.D.]; NOVIKOV, N.N. [Novykov, N.N.]

Study of small volume changes on annealing deformed vacuum-treated nickel. Ukr. fiz. zhur. 3 no.2:274-276 Mr-Ap '58. (MIRA 11:6)

1.Kiivs'kiy derzhavniy universitet im. T.G. Shevchenka.
(Nickel--Testing)

GERTSRIKEN, S.D. [Hertsriken, S.D.]; NOVIKOV, N.N. [Novykov, N.N.]

Density of dislocations occuring during deformation of nickel, silver and aluminum. Ukr.f'z.zhur. 3 no.5:695-696 S-O '58. (MIRA 12:2)

1. Kiyevskiy gosudarstvennyy universitet.
(Dislocations in metals)

GERTSRIKEN, S.D. [Hertsriken, S.D.]; NOVIKOV, N.N. [Novykov, M.M.]

Determination of the density of dislocations arising during deformation of nickel, silver, aluminum and some silver alloys [with summary in English]. Ukr. fiz. zhur. 1 no.6:802-814 N-D '56.
(MIRA 12:6)

1. Kiyevskiy gosudarstvennyy universitet.
(Dislocations in metals)

[illegible]

AUTHOR: [illegible]

TITLE: [illegible] elektronnyy [illegible]

PERIODICAL: [illegible] (USSR)

ABSTRACT: [illegible] indicators, which are placed at [illegible] different points [illegible] kept at a constant temperature. [illegible] voltage is applied to [illegible] resistance [illegible] serves the purpose of compensating [illegible]. For the purpose of indicating [illegible] is used. If the thermo- [illegible] the compensation voltage, [illegible] locking bar [illegible] indicator a [illegible] fastened in order [illegible] light [illegible] source from [illegible] located above [illegible] measuring [illegible] force increases [illegible] light impinges upon the

Card 1/3

[illegible] Electrical [illegible] S [illegible]-11/15

[illegible]resistance, [illegible] which a current [illegible] If [illegible] the [illegible] drops in [illegible] A, a relay of the [illegible] switched in, so that [illegible] the measur- [illegible] a single [illegible] is fixed [illegible] to the com- [illegible] was used with [illegible] temperature-control error [illegible] German silver (argentan)- [illegible]. There is 1 figure.

[illegible]CIATION: [illegible]
[illegible] State [illegible]

Card 2/2

PODZEY, A.V.; LOGINOV, V.Ye.; NOVIKOV, N.N.

Measuring residual stresses by strain gauges. Stan.i instr. 29 no.6:25-27 Je '58. (MIRA 11:7)
(Strain gauges) (Strains and stresses--Measurement)

CHUBAROV, A.D., inzh.; NOVIKOV, N.N., inzh.

Deformations of surface layers of titanium and heat-resistant alloys caused by cutting. Vest. mash. 38 no.9:40-42 S '58. (MIRA 11:10)

(Metal cutting) (Heat resistant alloys) (Titanium alloys)

GERTSHIKEN, S.D.; NOVIKOV, N.N.

Studying small changes of volume during the annealing of deformed nickel. Issl.po zharopr.splav. 4:134-139 '59. (MIRA 13:5)

(Annealing of metals) (Nickel--Metallography) (Dilatometry)

GERTSRIKEN, S.D. [Hertsriken, S.D.]; NOVIKOV, N.N. [Novykov, M.M.]

Determination of the dislocation density in strained metals from microhardness measurements. Ukr. fiz. zhur. 4 no.2:247-253 Mr-Ap '59. (MIRA 13:1)

1. Kiyevskiy gosudarstvennyy universitet.
(Dislocations in metals)

GERTSRIKEN, S.D. [Hertsriken, S.D.]; NOVIKOV, N.N. [Novikov, M.M.]

Nature of thermo-emf produced by metal deformation. Ukr. fiz. zhur. 4 no.3:293-299 My-Je '59. (MIRA 13:2)

1.Kiyevskiy gosudarstvennyy universitet im. T.G. Shevchenko.
(Metals--Electric properties)
(Thermoelectricity)
(Dislocations in metals)

GERTSRIKEN, S.D. [Hertsriken, S.D.]; NOVIKOV, N.N. [Novykov, M.M.]

Certain physical charecteristics of defects arising in the deformation of a metal. Ukr.fiz.zhur. 4 no.4:527-530 Jl-Ag '59. (MIRA 13:4)

1. Kiyevskiy gosudarstvennyy universitet im. T.G.Shevchenko. (Deformations (Mechanics) (Metals)

GERTSRIKAN, S.D. [Herteriken, S.D.]; NOVIKOV, N.N. [Novykov, M.M.];
KOPAN', V.S.

Distribution of crystal lattice defects along the diameter of the specimen in various types of deformation. Ukr.fiz.zhur. 4 no.4:530-534 J1-Ag '59. (MIRA 13:4)

1. Kiyevskiy gosudarstvennyy universitet im. T.G.Shevchenko.
(Crystals--Defects) (Deformations (Mechanics))

PODZEY, A.V.; LOGINOV, V.Ye.; NOVIKOV, N.N.

Measuring cutting forces with strain gauges. Stan.i instr. 30 no.3: 24-25 Mr '59. (MIRA 12:3)
(Strain gauges) (Metal cutting)

PODZEY, A.V.; LOGINOV, V.Ye.; NOVIKOV, N.N.

Calibration device for strain gauges. Stan.i instr. 30 no.4:24 Ap '59. (MIRA 12:6)
(Strain gauges) (Calibration)

NOVIKOV, N. N., Cand Phys-Math Sci -- (diss) "Research into the formation and removal of defects of crystal lattice in metals deformed and tempered at high temperatures." Kiev, 1960. 16 pp; (Ministry of Higher and Secondary Specialist Education Ukrainian SSR, Kiev Order of Lenin State Univ im T. G. Shevchenko); 150 copies; price not given; bibliography at end of text; (KL, 22-60, 131)

GERTSRIKEN, S.D.; NOVIKOV, N.N.

Studying the processes taking place in the annealing of plastically deformed copper. Izv.vys.uchob.zav.;fiz. no.2:37-43 '60.
(MIRA 13:8)

1. Kiyevskiy gosuniversitet im. T.G.Shevchenko.
(Annealing of metals) (Copper)

GERTSRIKEN, S.D.; NOVIKOV, N.N.

Connection between the dislocation density, the thermo-e.m.f. and the metal hardness. Issl. po zharopr. splav. 6:105-111 '60. (MIRA 13:9)

(Electromotive force) (Dislocations in metals)

00025

18.7500
18.8100

S/126/60/009/02/012/033
E062/E335

AUTHORS: Gertsriken, S.D. and Novikov, N.N.

TITLE: Study of the Quenching and Removal of Vacancies in Ag and Pt by a Thermal emf Method

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 2, pp 224 - 235 (USSR)

ABSTRACT: The activation energy for self-diffusion in solids (Q) is given by the sum of the activation energies required for the formation (Q_1) and for the motion (Q_2) of vacancies. In the past, experimental determinations of Q_1 have been based on the effect of temperature on the electrical resistance or on the length of metal and alloy specimens (Refs 1-5). The authors determine both Q_1 and Q_2 by measuring the emf of thermocouples consisting of an annealed and a quenched specimen of the same material. Samples (thin strips) of Ag of 99.99% purity and of thermocouple grade 99.7 to 99.9% pure Pt wire, 0.13 mm in dia, provided with potential leads for resistance thermometry, were resistively heated

Card1/4

4

68625

S/126/60/009/02/012/033
E062/E335

Study of the Quenching and Removal of Vacancies in Ag and Pt by a Thermal emf Method

to various temperatures (T °K) and quenched in distilled water. They were welded to slowly cooled samples of the same metal and the thermo-emf E_t of each couple was measured with a GZS-47 galvanometer of a sensitivity of 1.5×10^{-7} V/mm. Temperature differentials (80 °C for Ag, 150 °C for Pt couples) were provided by an oil-bath. Q_1 was obtained from the equation

$$\Delta n/n = A \exp(-Q_1/RT)$$

where $\Delta n/n$ is the relative number of vacancies and A is the appropriate entropy factor, Q_2 was obtained by following the decrease with time of the thermo-emf of couples held at various temperatures (60 to 100 °C for Ag, 300 to 500 °C for Pt).

Card 2/4

68025

S/126/60/009/02/012/033
E062/E335

Study of the Quenching and Removal of Vacancies in Ag and Pt by a Thermal emf Method

Q_1 = 23 200 ± 600 for Ag and 32 600 ± 1 000 for Pt;

Q_2 = 19 200 ± 200 for Ag and 30 200 ± 300 for Pt.

For each metal $Q_1 + Q_2$ agrees satisfactorily with the accepted value of the activational energy for self-diffusion. The precision is claimed to be superior to that of the more laborious resistivity method. The limitations of the method and the significance of the results are discussed. The sinks for vacancies, shown to exist in the bulk of the metal, probably consist of dislocations. There are 9 figures, 1 table and 36 references, 14 of which are English, 5 international, 4 French, 1 German, 4 Ukrainian and 8 Soviet.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet (Kiyev State University)

SUBMITTED: May 12, 1959

Card 4/4

69706
S/126/60/009/03/033/033
E193/E483

18.7500

AUTHORS: Gertsriken, S.D., Larikov, L.N. and Novikov, N.N.

TITLE: Volumetric and Structural Changes Taking Place in Cold-Worked Electrolytic and Cast Nickel During Heating

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 3, pp 478-480 (USSR)

ABSTRACT: It has been found, during earlier investigations (Ref 1,2) of nickel, deformed in torsion, that changes occurring in this metal during subsequent heating take place in two stages. During the first stage (relaxation), the decrease in the dimensions of the specimens is accompanied by liberation of a part of the latent energy of deformation and an increase in the electrical conductivity, hardness of the metal remaining practically constant. During the second stage (recrystallization), the volumetric changes are accompanied by the liberation of the main part of the latent energy of deformation, further increase in the electrical conductivity and a decrease in hardness. However, it has not been found possible to determine the transition from one stage to the other from the dimensional changes.

Card 1/6

69706
S/126/60/009/03/033/033
E193/E483

Volumetric and Structural Changes Taking Place in Cold-Worked Electrolytic and Cast Nickel During Heating

To find an explanation of this effect, it was necessary to correlate the volumetric changes with the structural changes taking place in the same specimens, subjected to various modes of deformation. Another interesting problem was to find out whether the effect of small gaseous additions on the temperature range of volumetric changes in deformed nickel is similar to that on the rate of growth of recrystallization centres, as revealed by X-ray analysis (Ref 3). It was for this reason that the present authors studied the volumetric and structural changes that, on heating, take place in various grades of plastically deformed nickel. Electrolytic nickel, containing 99.99% Ni, was used as the starting material. A portion of this material was melted in vacuum in order to remove the gaseous impurities (mainly hydrogen). The annealed specimens were deformed at room temperature either by drawing to 0.5 mm diameter or by twisting wires of the same diameter. The volumetric changes of the specimens during heating (at a rate of 50°C/h) were

Card 2/6

S/126/60/009/03/033/033
E193/E483

Volumetric and Structural Changes Taking Place in Cold-Worked Electrolytic and Cast Nickel During Heating

measured with the aid of a device described elsewhere (Ref 4). At the same time the variation of the X-ray diffraction patterns produced by specimens placed in the same apparatus and heated to the same temperatures at the same heating rates, was studied. The growth of the first recrystallization centres to dimensions of the order of 10^{-3} cm was revealed by appearance of spots on the backgound of Debye lines, this background disappeared when the process of recrystallization was completed. The experimental results are reproduced in Fig 1 and 2. Fig 1 shows the change of volume ($\Delta V/V \times 10^4$) in nickel deformed in torsion, plotted against the temperature, curves 1 and 2 relating to electrolytic nickel and nickel melted in vacuum respectively; the degree of deformation is given by nd/ℓ, where n is number of turns, d the diameter and ℓ the length of the specimen, the magnitude of nd/ℓ for the electrolytic nickel and for the vacuum-melted material was 0.3 and 0.25 respectively. The

Card 3/6

69706
S/126/60/009/03/033/033
E193/E483

Volumetric and Structural Changes Taking Place in Cold-Worked Electrolytic and Cast Nickel During Heating

results for nickel, deformed by drawing to $\varepsilon \simeq 96\%$, are reproduced in Fig 2, where $\Delta V/V \times 10^4$ (continuous curves, left-hand scale), and the width of the $\beta(331)$ lines (broken curves, right-hand scale) are plotted against temperature (°C); curves 1, 2 relate to electrolytic and vacuum-melted metal respectively; arrows pointing upwards indicate the appearance of spots on the X-ray pattern, arrows pointing downwards indicate disappearance of the diffuse background. It will be seen that the volumetric changes taking place during relaxation and recrystallization stages are more clearly separated in specimens deformed by drawing and containing gaseous impurities. "Spreading" of these effects in a wide temperature interval in the case of specimens deformed in torsion is obviously associated with the non-uniform character of the relaxation processes taking place in non-uniformly deformed material. Small deflections on the volume versus temperature curves reflect the processes of relaxation and recrystallization

Card 4/6

69706
S/126/60/009/03/033/033
E193/E483

Volumetric and Structural Changes Taking Place in Cold-Worked Electrolytic and Cast Nickel During Heating

taking place in the outer, most heavily deformed layer of the torsion specimens; it was also these layers that produced the X-ray diffraction pattern. The transition from the relaxation to recrystallization stage in vacuum-melted nickel specimens is not shown distinctly on the volume versus temperature curves either; this is due to the fact that the temperature ranges of relaxation and recrystallization are very close. The relaxation and recrystallization stages can be easily distinguished in specimens of electrolytic nickel containing small proportions of gaseous impurities. Although the volumetric changes corresponding to the relaxation stage terminate at the same temperature as in pure nickel, they take place within narrower temperature range. Similar narrowing of the temperature range of volumetric changes is observed also during recrystallization; in this case, however, the effect is displaced towards the region of higher temperature in full agreement with the X-ray data. It should be pointed out also that,

Card 5/6

69706

S/126/60/009/03/033/033
E193/E483

Volumetric and Structural Changes Taking Place in Cold-Worked Electrolytic and Cast Nickel During Heating

according to the X-ray data, the second stage of the volumetric changes taking place during heating of deformed nickel appears to be a result of the formation and growth of the recrystallization centres; this is indicated by the fact that the temperature range of volumetric changes coincides with the temperature range of the recrystallization process. There are 2 figures and 6 references, 3 of which are Soviet, 2 English and 1 German.

ASSOCIATION: Institut metallofiziki AN USSR
(Institute of Physics of Metals AS UkrSSR)
Kiyevskiy gosudarstvennyy universitet im T.G.Shevchenko
(Kiyev State University imeni T.G.Shevchenko)

SUBMITTED: July 6, 1959

Card 6/6

GERTSRIKEN, S.D.; NOVIKOV, N.N.; SLYUSAR, B.F.

Dilatometric determination of the density of thermal vacancies, the energy of their creation and the activation energy of their departure. Fiz.met.i metalloved. 9 no.3:465-467 Mr '60. (MIRA 13:6)

1. Kiyevskiy gosudarstvennyy universitet imeni T.G.Shevchenko. (Crystal lattices) (Dilatometry)

GERTSRIKEN, S.D.; LARIKOV, L.N.; NOVIKOV, N.N.

Volumetric and structural changes during the heating of cold-deformed electrolytic and remelted nickel. Fiz.met.i metalloved. 9 no.3:478-480 Mr '60. (MIRA 13:6)

1. Institut metallofiziki AN USSR i Kiyevskiy gosudarstvennyy universitet im. T.G. Shevchenko.
(Nickel--Metallography)

25963
S/535/60/000/129/001/006
E032/E514

11100

AUTHOR: Novikov, N. N., Engineer

TITLE: An investigation of the temperature field in a machined metal during grinding

PERIODICAL: Moscow. Aviatsionnyy institut. Trudy, No.129, 1960. Issledovaniye fizikomekhanicheskikh i ekspluatatsionnykh svoystv detaley posle obrabotki, pp.5-41

TEXT: The aim of the present paper is stated as follows:
1) to develop an analytical method for calculating the temperature field in a metal being machined as a function of time;
2) to develop a method for the experimental determination of the temperature field so that the analytical calculations can be checked;
3) to generalise experimental data on the temperature field in the machined metal, obtained for special values of the grinding parameters.
The analysis begins with the heat transfer equation

$$\frac{\partial T}{\partial \tau} = \alpha\left(\frac{\partial^2 T}{\partial x^2} + \frac{\partial^2 T}{\partial y^2} + \frac{\partial^2 T}{\partial z^2}\right) \tag{2}$$

25963

An investigation of the temperature ... S/535/60/000/129/001/006
E032/E514

where $a = \lambda/c\gamma$ is the temperature diffusivity, λ is the thermal conductivity, c is the specific heat and γ the specific weight. The last three coefficients are assumed to be constant, so that the heat transfer equation is in fact the linear equation given by Eq.(2). It is stated that solutions of this equation which might be suitable for engineering purposes are not available at present. Corresponding Member AS N. N. Rykalin has recently developed a very general method (Ref.3: "Calculation of thermal phenomena during welding", Mashgiz, 1951) which can be used in this connection. The principle of the method is to replace the process under investigation by an equivalent set of heat sources, obeying the appropriate space and time distribution. An elementary point source in an unbounded solid is then characterised by the Green function

$$T(R,\tau) = \frac{q}{c\gamma(4\pi a\tau)^{3/4}} e^{-\frac{R^2}{4a\tau}} \quad (4)$$

where R is the radius-vector and q the source strength. This equation represents a special solution of the general heat transfer

Card 2/17

equation, and all other solutions for, say, linear or plane sources, can be obtained by integrating it. As an example of this analysis the present author takes the case shown schematically in Fig.1. This figure illustrates the kinematics of plane grinding and the various symbols employed. The blank which is being machined moves back and forth along the z-axis with a velocity of $v_{\text{д}}$. The metal is cut to a given depth t along the y-axis and this takes place with a velocity equal to the algebraic sum of the circular velocity of the grinding wheel and the reciprocal motion of the blank ($v_{kp} \pm v_{\text{д}}$). Since $v_{\text{д}}$ is small it is neglected in the following analysis. In order to cut the adjacent layer of the metal, the blank is displaced sideways along the x-axis through a distance $s_{\text{п}}$. The analytical solution is obtained by assuming that the heat is produced in a small (compared with the dimensions of the blank) surface element in the region of the immediate contact of the grinding wheel with the blank and that the heat source acts continuously and is being displaced over the surface of the blank with a constant velocity. The form and the dimensions of the heat source are characterised by the contact area between the grinding wheel and the blank. To analyse the heat transfer in the surface layers of the machined metal it is convenient to consider the heating of an infinite plate by: 1) a moving linear source, and 2) a strong fast-moving linear source. In the case of the arrangement illustrated in Fig.4 the machined blank is in the form of a semi-infinite plate bounded on each side by perfectly insulating walls, and the heating is due to a transverse linear source moving with a constant velocity v_{Ω} and having a constant linear intensity $q_1 = q/s_{\Omega}$ (cal/cm.sec). In the steady state the temperature distribution is then given by

$$T(r,z) = \frac{q_1}{\pi\lambda} \exp\left(-\frac{v_{\Omega} z}{2\alpha}\right) K_o\left(r\sqrt{\frac{v_{\Omega}^2}{4\alpha^2} + \frac{b}{\alpha}}\right) \qquad (8)$$

where K_o is the zero order Bessel function of the second kind. This solution has been used to investigate the temperature field within the blank. A second solution which holds for a region comparable with the dimensions of the source is given by

$$T(y,\tau) = \frac{q_2}{\sqrt{\pi\lambda c\gamma\tau}} \exp\left(-\frac{y^2}{4\alpha\tau} - b\tau\right) \qquad (9)$$

This case is illustrated by Fig 5. Here the velocity of the source is very high and the plate is divided into a number of thin section with adiabatic boundaries at right angles to the plane of motion of the source. These sections are successively heated by instantaneous equivalent plane sources having surface intensities $q_2 = q/v_{\mu} s_{\eta}$ (cal/cm^2.sec). Since the displacement velocity of the source is very high, the propagation of heat is essentially linear and is a function of the coordinate y and time τ only. In the above equations [(8) and (9)], b is the surface emmissivity. If this is neglected, then Eq.(9) assumes the simplified form

$$T(y,\tau) = \frac{q^2}{\sqrt{\pi\lambda c\gamma\tau}} \exp\left(-\frac{y^2}{4\alpha\tau}\right) \qquad (10)$$

25963

An investigation of the temperature ... S/535/60/000/129/001/006
E032/E514

Experiments have shown that Eqs.(8) and (10) can be used to describe the temperature field within the machined blank except for the region in immediate contact with the grinding wheel ($y = 0$, $\tau = 0$). In addition, it is essential to have some knowledge of the temperature in the latter region. This problem is solved with the aid of the following simple scheme. A constant fixed source $q_2 = q/F_o$ acts at the end of a semi-infinite rod. In this case the steady state temperature field is given by

$$T(y, \tau = \infty) = \frac{q}{F_o \sqrt{b\lambda c\gamma}} \exp\left(-|y| \sqrt{\frac{b}{a}}\right) \qquad (15)$$

where F_o is the area equal to the contact zone. Hence the temperature in the contact zone ($y = 0$) is given by

$$T(y = 0, \tau = \infty) = \frac{q}{F_o \sqrt{b\lambda c\gamma}} \qquad (16)$$

Eqs.(8), (10) and (16) are sufficient to set up the complete

Card 6/17

temperature field. They can be used to calculate the maximum and average temperatures throughout the machined specimen. The above analysis applies to the case where the wheel is not displaced sideways in successive strokes. In the general case the situation is as illustrated in Fig.7. Here the grinding wheel moves along the arrowed path (in the direction of the z-axis) with a constant velocity v_z. The transverse feed is such that the equivalent heat source heats a band having a width ℓ_Ω. The velocity in the z-direction is much greater than the velocity in the x-direction. The problem is solved by assuming that from the heat transfer point of view the system is equivalent to a heat source q uniformly distributed over a strip of length ℓ_Ω which is displaced in the x-direction with a constant velocity v_x. In deriving the equations appropriate to this case, use is made of the reciprocity principle. The analysis is carried through to obtain formulae describing the temperature field both in the body of the blank and in the contact region. Analytical investigation of the thermal process during grinding enabled expressing the basic relations of heat propagation by means of equations based on simplifying assumptions. Since the theory of heat conductivity is based on the Fourier hypothesis on the proportionality of the heat flow and the temperature gradient, and the classical differential equation of heat conductivity expressing the relation between the parameters of the temperature field is based on the assumption of an infinitely high speed of propagation of the heat in the solid body, which does not correspond to reality in the grinding process, the final solution of the correct selection of computation methods and equations can only be obtained by experiment. The experimental investigations consisted of the following stages: 1) selection of the material; 2) selection of the technological machining parameters determining the nature of the heat release; 3) determination of the effective power of the heat sources; 4) investigation of the thermal cycles and determination of the temperature in the contact zone; 5) plotting of the temperature field. Materials were chosen so as to obtain greatly differing chemical compositions and physical and mechanical behaviour, i.e. titanium alloy, nickel-base high temperature alloy, steel. To obtain comparable experimental data, specimens of the same shape and dimensions were chosen,

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001137430007-5"

namely, 120 x 60 x 6'. Experiments were carried out on a plain grinding machine with a maximum speed of 7.2 m/min, the transverse feed being automatically controlled, whilst the vertical feed was manually controlled by means of a Vernier gauge with scale divisions of 0.01 mm. The spindle had a speed of 2850 r.p.m. and the driving motor had a power of 1.1 kW. The conditions for finish grinding were selected on the basis of recommendations published in literature. The basic parameter determining the process of heat release was the effective power of the heat from the source, q, released inside the component during grinding per unit of time. Without knowning this value, the temperature field cannot be analytically calculated. To determine the heat released into the component during plain grinding, a special calorimetric set-up was used which contained an attachment for fastening and holding in position of the specimen, which was located in a closed bath. The equipment and the principle of operation of this calorimeter were described in an earlier paper (Ref.12: A. V. Podzey, N. V. Novikov, V. Ye. Loginov, Stanki i instrument, 1957, No.8). The used technique enabled eliminating losses caused by transferring the specimen from the point of machining

25963

An investigation of the temperature ... S/535/60/000/129/001/006
E032/E514

into the calorimeter and also the losses caused by radiation. These calorimetric measurements enabled determining the quantity of heat released in the component during plain grinding as a function of the main technological parameters of the process. The power of the heat source q, cal/sec, for the investigated materials as a function of the depth of grinding $t_{л}$, mm, is plotted in Fig.11 for the machining conditions: $v_{кр}$ = 30 m/sec, $v_{д}$ = 7.2 m/min. The inset top graphs give the hardness, the inset bottom graphs give the grain size; plot a refers to steel 45, plot б to the refractory alloy ЭИ437А (EI437A), plot в to the titanium alloy ВТ5 (VT5). With increased depth of the removed layer the power of the heat source increases sharply but this increase stabilizes at a definite depth of grinding. Thus, for instance, up to a depth of grinding of 0.03 mm the power of the heat source increases almost linearly and stabilization can be observed in the heat generation for a depth of grinding equalling about 0.04 mm. This is attributed to an increase in the dimensions of the contact zone and a decrease in the cutting ability of the abrasive grains. The experiments confirm the

25953

An investigation of the temperature ... S/535/60/000/129/001/006
E032/E514

conclusions of numerous authors that the intensity of heat generation increases with increasing hardness of the grinding wheel. With increasing speed of the component the quantity of generated heat penetrating into the component drops sharply in the range of speeds applied in practical work. The experimental investigation of the temperature field in the metal during grinding consisted in the study of the changes in the thermal cycles in various points of the specimen (including the contact zone) during passage of a heat source along the surface. The temperature was determined by measuring the physical quantity of a property which is unequivocally linked with the temperature. For this purpose a relatively simple set-up was used, based on the thermo-electric method which was described in an earlier paper of the author and A. V. Podzey and V. Ye. Loginov (Ref.13: Stanki i instrument, 1957, No.10). For determining the temperature in the contact zone some authors used the indirect method of observing the structural transformations of fine boundary layers (A. A. Al'tshuler, B. I. Kostetskiy, Ye N.Maslov, M. P. Speranskaya, A. G. Spektor, G. N. Sidorov and others). The author of this paper measured the temperature directly by means

Card 11/17

of a thermocouple built into the grinding wheel and this enabled excluding completely any influence on the heat flow in the machined component. The following contact zone temperatures (°C) were obtained experimentally and analytically for some of the materials investigated:

Material	Experimental	Analytical
EI437 (Ni-base alloy)	1225	1380
Steel 45	1460	1520
VT5	1640	1760

These temperatures were measured for grinding without cooling with a speed of the grinding wheel of 30 m/sec, a depth of cut of 0.025 mm/rev. The given values are averages of 20 to 25 measurements. These experimental data show that the instantaneous temperature in the cutting zone may reach the fusion temperature of the machined material. In Fig.15 data are plotted on the temperature fields at a depth of 0.1 mm. These are based on experimental data and values calculated according to Eqs.8-10. The origin of the coordinate system relates to the instant of passage of the centre of the grinding wheel above the centre of the thermocouple. The curves relate to a grinding wheel speed of 30 m/sec, v_{Δ} = 7.2 m/min, s_{Π} = 10 mm/stroke and t_{Π} = 0.05 mm. The circles denote experimental values, whilst the crosses denote calculated values. Curves (t,°C vs. τ,sec) are plotted for Steel 45, the alloy EI437 and VT5. The experiments confirm the conclusions of other authors that with increasing speed of movement of the component v_{Δ} the quantity of heat fed into the component decreases. Having determined the temperature fields, it is possible to select machining parameters in such a way that temperature conditions are produced which ensure the desired quality of the surface layer. The here proposed experimental technique has the following advantages: simplicity; it does not require extensive preparation; the contact of the thermoelectrodes is reliable; the heat flow in the components is not distorted; the measuring accuracy is satisfactory; it is possible to measure the temperature in the zone near to the surface of the component ($y \geqslant 0.05$) and in the contact zone ($y = 0$). There are 17 figures, 3 tables and 15 references: all Soviet.

32079

S/181/61/003/012/014/028
B104/B102

24.7400 (1055, 1454, 1555)

AUTHORS: Gorid'ko, N. Ya., Kuz'menko, P. P., and Novikov, N. N

TITLE: Mechanical properties of germanium as a function of carrier concentration

PERIODICAL: Fizika tverdogo tela, v. 3, no. 12, 1961, 3650 - 3656

TEXT: The variation in microhardness of the surface layer of germanium with varying concentration of free carriers has been studied. The micro hardness was measured with a ПМТ-3 (PMT-3) instrument at loads of 3 - 5 g. The indentations were measured with an immersion objective (200CK) in order to reduce the error in measurement. The carrier concentrations were changed by irradiating the germanium surface with light of varying intensity. 300-w motion-picture lamps circularly arranged at a distance of 10 cm from the specimen were used for the purpose. A maximum light intensity of 50,000 lux was reached. It was lowered by removing some reflectors and lamps. Fans prevented the specimens and lamps from heating. The carrier concentration was also changed by carrier injection from point

Card 1/6

contacts. For this purpose, a plate with probes was attached to the PMT-3 instrument in such a way that the probes were regularly arranged around the point where the indentor penetrates into the specimen. Preliminary experiments have shown that at a stress of 3 - 5 g the indentations are entirely in the layer (1 - 2μ) where the photomechanical effect occurs. The experiments have indicated that the variation in hardness of the germanium specimen is due to the variation in carrier concentration (Fig. 2), no matter how the carriers are introduced into the semiconductor. The variation in hardness must therefore be related to a variation in dislocation density or mobility. It is concluded from the results that it is the dislocation mobility that varies. After irradiation with 40 - 50,000 lux for several hours, the properties of the surface layer passed over into a new state, in which the indentations were surrounded by bright and dark rings ("aureoles") which vanished after holding at room temperature or in boiling water for several hours. The aureoles are now being examined. V. N. Dobrovol'skiy is thanked for discussions. There are 5 figures, 1 table, and 5 references: 1 Soviet and 4 non-Soviet. The three references to English-language publications read as follows: G. C. Kuczinski and

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001137430007-5"

Mechanical properties of ...

S/181/61/003/012/014/028
B104/B102

R. H. Hochman. Phys. Rev., 108, 946, 1957; J. Appl. Phys., 30, 267, 1959;
W. T. Read. Phil. Mag., 45, 367, 1954.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: July 6, 1961

4

Card 3/6

32463

S/535/61/000/140/003/006
D240/D304

1 1100

AUTHOR: Novikov, N.N., Engineer

TITLE: Determining the effective power of heat sources in investigating the temperature field in a metal during grinding

SOURCE: Moscow. Aviatsionnyy institut. Trudy, no. 140. Tekhnologicheskiy metody povysheniya kachestva detaley i uzlov aviadvigateley, 1961, 29-36

TEXT: The author gives the results of mathematical data processing and empirical formulae obtained for the refractory alloy ЭИ 437А (EI437A) based on nickel, the titanium aloy ВТ 5 (VT5) and the steel 45, all widely employed in aircraft industry. For the 45 steel the formula is $q = 120.7\ V_w^{-0.38}\ S_f t^{0.88}\ K_h K_g K_m$ where q is the effective power of the heat source, V_w the velocity of displacement of the specimen.

Card 1/2

32403
S/535/61/000/140/003/006
D240/D304

Determining the ...

S_f the cross-feed of the grinding disc. and K_h, K_g, K_m are correction factors depending respectively on the hardness, granularity and material of the abrasive grains [Abstracter's note: t not defined; for temperature and time other notations are used]. A table of these factors is given. Recommended regimes of plane grinding of the VT alloys according to. 1) Western literature, 2) the data of factory offices and design offices, 3) NIAT, 4) the method proposed by the author, are compared in a table. The author states his previous investigations showed that for analytical design of temperature dependences one can use the equation obtained by N.N. Rykalin, Corresponding Member AS USSR (Ref. 3 Raschety teplovykh protsessov pri svarke (Design of thermal processes in welding) Mashgiz 1951). There are 1 figure, 2 tables and 3 Soviet-bloc references.

Card 2/2

NOVIKOV, M. M.

S/185/61/006/002/011/020
D210/D304

AUTHORS: Hertsriken, S.D., Novykov, M.M., Horid'ko, M.Ya.

TITLE: Determining the density of dislocation formed during the deformation of armco iron and magnesium

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 6, no. 2, 1961, 229 - 232

TEXT: The authors describe an experimental study of dislocation in armco iron and magnesium as a function of deformation and temperature, using the volume change as a measure of the density of dislocation. The experimental method used is the same as that described in an earlier publication. The curves obtained for a heating rate of 60 deg/hr. are similar to such curves for other metals. For iron there are two noticeable steps in the curves at about 300-350°C and 450-550°C. If dislocations are assumed to take place after the second step, then vacancies should appear between the first and the second step. Dislocated atoms or vacancy pairs should take place at the first step. A table shows the mean volume changes,
Card 1/2

the calculated dislocation densities N and the number of vacancies Δn. The number of vacancies was calculated from the formula $\Delta n = (d_0 N_0/A)(\Delta V/V)$ where N_0 - Avogadro's number; A - atomic weight; d_0 - density. The dislocation density was calculated from the formula $N = (d_0 N_0/A)^{2/3}/(\Delta U/U)$. The authors point out that the high value of volume change, 10^{-3}, as well as the hardness of the annealed sample, 126 kg/mm^2, indicates that their iron specimen may not have been very pure. For magnesium it was found that the hardness - deformation curve had a similar shape to volume change - deformation curve. There are 5 figures, 1 table and 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Kyyivs'kyy ordena Lenina derzhavnyy universytet im T.H. Shevchenka (Kiyev Order of Lenin State University)

SUBMITTED: July 2, 1960