

PUTMAN, J.

Regulator of the hydrochloric acid concentration.

p. 547. (Chemický Průmysl. Vol. 7, no. 10, Oct. 1957, Praha, Czechoslovakia)

Monthly Index of East European Accessions (MEEA) IC. Vol. 7, no. 2,
February 1958

CZECHOSLOVAKIA

UDC 613.632:547.538.141

SIMKO, Andrej; JINDRICOVA, Jirina; RULTAROVA, Helena; Department of Occupational Diseases, Krajsky Institute of National Health of the Kraj of East Bohemia (Oddeleni Chorob z Povolani, KUNZ Vychodoceskeho Kraje), Hradec Kralove, Head (Vedouci) Docent Dr J. JINDRICOVA.

"Effect of Styrene on the Health of Workers Employed in the Production of Laminates."

Prague, Pracovni Lekarstvi, Vol 18, No 8, Oct 66, pp 348-352

Abstract /Authors' English summary modified 7: Health of 101 women and 27 men employed in the production of styrene laminates was investigated. Average exposure was 1.8 years, with a maximum of 3 years. Styrene concentrations up to 700 mg/cubic meter were recorded; this is 3.5 more than the Czech legal maximum. Skin disease and neurasthenic syndromes were found; no affection of the liver or the gall bladder was determined. The amount of mandelic acid and of creatinine in the urine is a good indication of the exposure to styrene vapors. Testing can be made at the end of the working period. 5 Tables, 5 Czech, 3 Russian references. (Manuscript received 16 Jul 65).

1/1

PULTORAK JERZY

POLAND/Electronics - Photocells and Semiconductor Devices

H-8

Abs Jour : Ref Zhur - Fizika, No 5, 1958, No 11171

Author : Pultorak Jerzy
Inst : Not Given
Title : Transistor with High Current Gain Coefficient

Orig Pub : Zesz. nauk. Politechn. warsz., 1957, No 33, 79-104

Abstract : The author examines the variation of the output characteristics and current gain of point-contact transistors with the properties of the materials used for its manufacture and with various factors of constructional character. A point-contact transistor with additional emitter is examined from this aspect. The passage of a current of minority carriers through the second emitter of this transistor increases the coefficient (under certain conditions) to approximately 20. The optimum operating conditions, the choice of the material, and the mode of formation of the transistor with additional emitter are analyzed. Curves are given for the dependence of the coefficient of the transistor on certain constructional and operating parameters. It is shown that it is possible to

Card : 1/2

PULTORAK, J.; MODRZEJEWSKI, A.

Fast switching Al-Si silicon diode. Archiw elektrotech 11
no. 1:187-190 '62.

1. Zaklad Elektroniki, Instytut Podstawowych Problemow
Techniki, Polska Akademia Nauk, Warszawa.

PULTORAK, J.

3
1-4E1d

²⁵
Point Junction Transistors. W. Rosifski and J. Pultorak.
(Bull. Acad. Polon. Sci., 1957, [iv], 5, (2), 95-98).—[In English].
A new design is described in which the emitter contact is replaced
by an alloyed p-n junction, improving mech. properties and being
relatively insensitive to displacement of the collector contact.
—J.C. 224

row

PULCORN, J.; ROSINSKI, W.

Point-junction transistors. In English. p. 95. (Bulletin, Vol. 5, No. 2, 1957, Warsaw, Poland)

EO: Monthly List of East European Accessions (EMAL) IC, Vol. 6, No. 8, Aug 1957. Uncl.

BUROKAM 3.

The p-n junction under exclusion and accumulation conditions
of minority carrier carriers. Arch. elektrotech 13 no. 3
221-224 1964.

1. Department of Electronics, Institute of Basic Technical
Problems, Polish Academy of Sciences, Warsaw. Submitted
January 20, 1964.

L 54051-65

EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(h) Pz-6/Pe6 IJP(c) JD/AT

ACCESSION NR: AP5009090

FO/0053/65/000/002/0069/0075

AUTHOR: Pultorak, J.

TITLE: Germanium p-n and l-h junction diodes

SOURCE: Przegląd elektroniki, no. 2, 1965, 69-75

TOPIC TAGS: junction diode, pn lh junction diode, diode, pn junction diode, lh junction diode, rectification factor, back current, conduction current, minority carrier, minority carrier frequency, germanium diode

ABSTRACT: The p-n and l-h junction diode (see Fig. 1 of the Enclosure) having a minimum saturation current and capable of high-density current conduction has been designed so that the thickness of the base is much smaller than the diffusion length of the minority carriers, and the l-h junction, which serves as a drain of the base, has the lowest possible recombination frequency of the minority carriers. The advantages of this diode as compared with conventional types are: 1) a substantially higher (by approximately one order of magnitude) maximum conduction current; 2) low polarizing voltage corresponding to the maximum conduction current and, consequently, low power losses; 3) the possibility of obtaining a linear characteristic of $\log I = f(U)$ in the conduction direction in the approximate range of

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L 54051-65

ACCESSION NR: AP5009090

$10^{-5} - 10^3$ A/cm²; and 4) a considerably lower (by two orders of magnitude) back current. The experimental results make it possible to estimate the rectification factor of the p-n and i-h junction diode, defined as the ratio of the maximum conduction current to the back current, at $k_p = 10^8$ exceeding by more than two orders of magnitude the possibility of estimating the rectification factor of conventional diodes. Orig. art. has: 7 formulas and 8 figures.

ASSOCIATION: Zaklad Elektroniki IPPT PAN (Electronics Plant IPPT PAN)

SUBMITTED: 00

ENCL: 01

SUB CODE: EC

NO REF SOV: 001

OTHER: 010

Card 2/3

FULPRAK, J.; ROSINSKI, W.

The influence of forming upon the Cutoff frequency of point transistors.
P. 385. ARCHIWUM ELECTROTECHNIKI. Warszawa. Vol. 4, no. 2, 1955

Source: East European Accessions List, (EEAL), Lc, Vol. 5, No. 3, March, 1956

FULTORAK, J. ; ROSINSKI, W.

Influence of forming upon the Olcutoff frequency of point transistors. p. 385.
ARCHIWUM ELEKTROTECHNIKI. "aszawa. Vol. 4, no. 2, 1955

Source: East European Accessions List, (EEAL), Lc, Vol. 5, No. 3, March, 1956

Pu, TORAK, J

²⁵
Point-Junction Transistors. W. Kiciński and J. Pullorak. *Bul. Acad. Polon. Sci. (Warsaw)*, No. 2, 1957, pp. 95-98. Description of the design difficulties associated with the point-junction transistor, its advantages, and its characteristics.

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1-4E/d

(32) arb

L 20484-65 EWT(1)/EWG(k)/EEC(k)-2/T/EWP(t)/EEC(b)-2/EWP(b)/EWA(h) Pm-4/Pz-6/
Feb IJP(c)/ASD(a)-5/AFWL/ESD(c)/ESD(t) JD
ACCESSION NR: AP4043027 P/0053/64/000/006/0261/0275

AUTHOR: Kompalo, Wladyslaw; Modrzejewski, Andrzej; Pultorak, Jerzy; Wojcik, Ireneusz

TITLE: Fast-switching silicon diode, type DS-50

SOURCE: Przegląd elektroniki, no. 6, 1964, 261-275

TOPIC TAGS: fast switching diode, fast switching silicon diode, silicon diode, diode, diode design, diode technology, flameless sealing method, semiconductor diode

ABSTRACT: This semiconductor diode has a base of small geometric dimensions with a low storage load. The Al-Si junctions are made of aluminum wire of spectral purity and single crystal silicon² having a natural resistivity of 15 to 25 Ωcm. The contacts consist of the following layers: Si disk - base solder - Mo ring - base solder. The envelopes for the diodes are made either of metal or glass. The technology for the manufacture of the diodes, developed at the Zakład Elektroniki IPPT - PAN (Electronics Department IPPT - PAN) at the recommendation of the Instytut Maszyn Matematycznych PAN (Institute for Computers PAN), is described in detail and presented graphically. It was found that the

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ACCESSION NR: AP4043027

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the diodes 1) resist, in the mean, constant tensile loads of 4 kg and break only under tensile loads exceeding 5 kg, during which only the glass envelopes and not the glass-metal junctions collapse; 2) withstand on the average 10 to 15 cycles of end bending; and 3) pass the torsion test and break only after 10 cycles of twisting. The waste of diodes due to bursting of the glass envelopes or rupture of the junctions amounted to only 6.4%, and these good results are ascribed to the use of flameless sealing methods for the glass envelopes. "The authors wish to thank Prof. Dr. Eng. W. Rosinski, Chief of Zaklad Elektroniki Instytutu Podstawowych Problemow Techniki PAN (Electronics Department of the Institute for Basic Engineering Problems PAN), and Pr. Dr. Eng. L. Lukasiewicz, Director of the Institute for Computers PAN for their permission to publish this article." Orig. art. has: 27 figures.

ASSOCIATION: none

SUBMITTED: 07Feb64

ENCL: 00

SUB CODE: EC

NO REF SOV: 001

OTHER: 009

Card 2/2

PUI.TORAK, Jerzy, mgr., inż.

Thyristor, a new semi-conductor device. Przegl elektrotechn 37 no.6:
229-236 '61.

1. Zaklad Elektroniki, Instytut Podstawowych Problemow Techniki
Polska Akademia Nauk.

31090

P/019/62/011/001/010/010
D265/D302

9.4340

AUTHORS: Pułtorak, J., and Modrzejewski, A.

TITLE: A fast switching Al-Si silicon diode

PERIODICAL: Archiwum elektrotechniki, v. 11, no. 1, 1962, 187-190

TEXT: A method of preparing the p-n junction of a small power Al-Si diode developed at the Institut elektroniki IPPT-PAN (Institute of Electronics of the Polish Academy of Sciences) is described. The negligible solubility of Si in Al allowed control of the depth of fusion and the eutectic bonding method used to produce the junction resulted in its regular shape. The process of fusing a thin aluminum rod (100 μ) into a silicon plate of 100 μ thickness soldered to a molybdenum base in an apparatus heated to 650°C, under N₂ was preceded by careful chemical etching and cleaning. Slight pressure was required to initiate the fusion. A small power Al-Si diode has thus been obtained with a switching time of about 60 x 10⁻⁹ sec. and maximum reverse current of 15 mA when switching from + 15 mA to -30 V. The diode has a small capacitance at zero bias, C₀ \approx 3pF and

Card (1/2)

A fast switching Al-Si silicon diode

P/G19/62/011/001/010/010
D265/D302

a high coefficient of rectification (forward current at + 1 V higher than 50 mA and reverse current at -30 V less than - 0.1 μ A). It can be used at temperatures up to + 140°C. There are 4 figures, 2 tables and 5 references: 1 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: M. J. Calle, C.A.P. Foxell, IEE, Int. Conv. on Transistors and Association Semiconductor Devices, 21-27 May 1959; H.E. Bridgers, J.H. Scaff, J.N. Shive, Transistor technology, v. I, p. 377, 1958. X

ASSOCIATION: Zakład elektroniki (Institute of Electronics)

SUBMITTED: July 12, 1961

Card 2/2

L 10694-65 ESD(c)/ASD(a)-5

ACCESSION NR: AP: 4046534

P/0034/64/000/008/0361/0361

AUTHOR: Pultorak, J. P. (Master Engineer)

TITLE: Glass silicon diode DG-50 with a short recovery time

SOURCE: Pomiary, automatyka, kontrola, v. 8, 1964, 361

TOPIC TAGS: fast switching silicon diode, glass silicon diode, silicon diode, flameless sealing method

ABSTRACT: This diode has been developed at the Zaklad Elektroniki IPPT-PAN (Electronics Plant IPPT-PAN) on the basis of direct eutectic contacts. The measurements of the diode are 10 x 3 mm, the ends are 30 mm long, and the weight about 0.5 g. Experimental results show that the diode's recovery time during switching from a +15 mA conduction current to a -30 V back voltage with a load resistance of 100 ohms amounts to 50×10^{-9} sec. The other values obtained are presented graphically. The diode displays a total resistance to a constant load of 4 kg, breaks occurring only at loads exceeding 5 kg. The diode ends pass 10 to 15 cycles of bending at an angle of $2 \times 45^\circ$ and break after 10 cycles of torsion at an angle of 360° . This high resistance was obtained thanks to the use of flameless methods in sealing the envelopes. Orig. art. has: 7 figures.

Card 1/2

L 10694-65

ACCESSION NR: AP4046534

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: EC

NO REF SOV: 000

OTHER: 003

Card 2/2

PULTORAK, Jerzy

Gold-Germanium eutectic contacts. Pt. 1. Przegl elektroniki 3 no.3:135-139 Mr '62

1. Zakład Elektroniki, Instytut Podstawowych Problemow Techniki, Polska Akademia Nauk, Warszawa.

ACCESSION NR: AP4043934

P/0019/64/013/002/0221/0246

AUTHOR: Pultorak, J.

TITLE: The p-n junction under minority carrier exclusion and accumulation conditions

SOURCE: Archiwum elektrotechniki, v. 13, no. 2, 1964, 221-246

TOPIC TAGS: semiconductor diode, germanium semiconductor diode, germanium diode, minority carrier, carrier exclusion, carrier accumulation, p n junction

ABSTRACT: This article presents experimental results concerning the effects of exclusion and accumulation in semiconductor germanium diodes. It was found that replacement of a base contact with high recombination velocity by an ℓ -h junction, along with changes in engineering principles, leads to a substantial improvement in the current-voltage characteristics of the diodes. The (p-n)-(ℓ -h) diode has a base contact in which the recombination velocity of the current carrier is described by

$$S = p_p / p_{p+} \sqrt{D_n^h / t_n^h}$$

where p_p and p_{p+} express the hole density of the p-p+ junction, D_n^h is the elec-

Cont 1/3

ACCESSION NR: AP4043934

tron diffusion constant in the h region, and τ_n^h is the electron lifetime in the h region. The current-voltage characteristic of the diode is described by

$$I = I_s(e^{\beta U} - 1) = [(qD_n n_p)/L_n] \tanh [(W/L_n)(e^{\beta U} - 1)],$$

where I_s is the saturation current, D_n the electron diffusion constant in the n region, n_p the electron density in the p region under thermodynamic equilibrium conditions, L_n the diffusion length of electron holes, and $\beta = q/kT$ (q being the electron charge, k Boltzmann's constant, and T the temperature in deg K). This equation was found valid for the blocking polarization of the diode where leakage currents as low as $3 \cdot 10^{-5} \text{A/cm}^2$ were obtained. The forward characteristic of the (p-n)-(h-h) diode agrees with this equation only when the bias does not exceed 0.05 V. The (p-n)-(h-h) diode permits the conduction of currents with densities to about $3 \cdot 10^5 \text{A/cm}^2$ and might have a linear characteristic of $\log I = f(U)$ in a range exceeding 5 current decades of conduction. It is concluded that these results can be obtained only if the recommended changes in the design and technology of the diode are made. Orig. art. has: 39 formulas and 23 figures.

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ACCESSION NR: AP4043934

ASSOCIATION: Zaklad Elektroniki IPPT--PAN (Electronics Factory IPPT--PAN)

SUBMITTED: 29Jan64

ENCL: 00

SUB CODE: 88

NO REF SOV: 002

OTHER: 020

Card 3/3

PULTORAK, J.

Alloyed junction p--n--n⁺ Germanium diode. Bul Ac Pol tech 10
no.5:[275]-[278] '62.

1. Laboratory of Semiconducting Devices, Department of Electronics,
Institute of Fundamental Technical Problems, Polish Academy of
Sciences, Warsaw. Presented by J.Groszkowski.

38297

P.053/62.000/003 001.001
1004.1204

9.4310

AUTHOR: Pultorak, Jerzy
TITLE: Gold-germanium eutectic contacts
PERIODICAL: Przegląd elektroniki, no. 3, 1962, 134-139

TEXT: Instead of directly bonding gold wire to germanium which gives deep and irregularly shaped contacts it is proposed to form first a "eutectic extension" on the wire by immersing it into a gold-germanium eutectic alloy. The alloy is contained in a molybdenum crucible where it is heated to 360 C in an atmosphere of dry hydrogen. Eutectic contacts obtained in this way possess the following features: (a) regular shape; (b) possibility of easy control of the penetration depth; (c) may be made at relatively low temperature; (d) their mechanical and electrical properties are no worse than those of contacts obtained directly. There are 9 figures

+

ASSOCIATION: Zakład Elektroniki IPPT PAN (Department of Electronics IPPT PAS)

Card 1/1

LOBANOV, A.N., doktor tekhn. nauk; PULTORAK, V.K., dotsent, kand. tekhn. nauk;
DUBINOVSKIY, V.B., kand. tekhn. nauk

Programmed teaching and the use of teaching machines in photogrammetry.
Izv. vys. ucheb. zav.; geod. i aerof. no.5:75-82 '64. (MIRA 18:5)

FUL'TR, A. [Ful'tr, A.]

Theory of the homologies of partially ordered sets. Soob. AN
Gruz. SSR 34 no.1:25-30 Ap'64 (MIRA 17:7)

1. Karlov universitet, Praga, Chekhoslovakiya. Predstavleno
akademikom G.S. Chogoshvili.

POULAT, A. [Pulter, A.]; GEORGIN, T. [Georgin, T.]

Representation of small categories. Dokl. AN SSSR 160 no.2:
284-286 Ja '65. (MIRA 18:2)

1. Karlov universitet, Praga, Chekhoslovatskaya Sotsialisticheskaya
Respublika. Submitted July 1, 1964.

L 32090-66 T IJP(c)

ACC NR: AP6020634

SOURCE CODE: CZ/0045/65/000/003/0195/0199

AUTHOR: Bukovsky, Lev--Bukovski, L. (Prague); Hedrlin, Zdenek--Gedrlin, Z. (Prague); Pultr, Ales--Pul'tr, A. (Prague)ORG: Mathematical Institute, CSAV, Prague (Matematicky ustav CSAV); Department of Principles of Mathematics, Mathematics-Physics Faculty, Charles University, Prague (Katedra zakladu matematiky Matematickofyzikalni fakulty Karlovy university)TITLE: Topological representation of semigroups and small categories

SOURCE: Matematicko-fyzikalny casopis, no. 3, 1965, 195-199

TOPIC TAGS: group theory, homomorphism, isomorphism, topology, mathematic space

ABSTRACT: J. de Groot proved the following theorem concerning a topological representation of groups: Let G be an arbitrary group. Then there exists a Hausdorff space T such that the group of all auto(homo)morphisms of T (under composition is isomorphic with G . The space T can be chosen to fulfill some other conditions, for example, to be metric or compact. A similar theorem for semigroups and small categories is proved in this article. [Orig. art. in Eng.] [JPRS]

SUB CODE: 12 / SUBM DATE: 05May64 / ORIG REF: 001 / OTH REF: 004

SOV REF: 001

Card 1/1

BLG

S/032/61/027/004/009/028
B110/B215

AUTHORS: Pul'tsin, N. M. and Pokrovskaya, V. B.

TITLE: Colored etching of titanium alloys

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 4, 1961, 424

TEXT: To examine the structures of titanium alloys types BT-2 (VT-2) and ВМТ-2 (IMP-2), the authors applied the methods of oxidizing polished faces at elevated temperature (hot etching), and oxidation in the electrolyte. In hot etching, specimens of ВМТ-2 (IMP-2) alloy were first polished and then etched with a reagent consisting of one part by weight of hydrofluoric acid, three parts by weight of nitric acid, and six parts by weight of water. After careful washing and drying, the ground faces were put into a muffle furnace, heated for three minutes to 600°C, and then air-cooled. After each treatment, the grains of the α-phase turned blue or bluish-violet depending on their color orientation, whereas those of the β-phase turned yellowish-brown. The larger number of inclusions in the α-phase in microphotographs is explained by the saturation of the ground face with oxygen and nitrogen (which are stabilizers of the

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S/032/61/027/004/009/028
B110/B215

Colored etching of...

α -phase) during heating to 600°C. Structural changes of the alloys may occur in hot etching. Prolonged and frequent heating to higher temperatures is therefore not suited for colored etching. Colored electrochemical etching may not cause any structural changes in the alloys. Besides, a better colored pattern of the examined structure is obtained by this method of etching. Electrochemical etching was conducted by the authors at 120 v and a current density of 0.05 a/cm² in the electrolyte containing 5 g of citric acid, 5 g of oxalic acid, 5 ml of orthophosphoric acid, 10 ml of lactic acid, 35 ml of water, and 60 ml of ethyl alcohol. Current was supplied in pulses of approximately 0.5 sec. The clearest pattern was obtained with ИМП-2 (IMP-2) alloy after five pulses, and with ВТ-2 (VT-2) alloy after two pulses. The color of the individual structural components in colored electrochemical etching also depends on its duration. The ground faces of the alloys types ИМП-2 (IMP-2) and ВТ-2 (VT-2) turned yellow even after a short time of etching, and then successively brown, violet, and blue due to longer etching. This sequence repeated when the process of etching was continued. In hot and electrochemical etching, the surface is recommended to be well polished, washed, and degreased. For laying the structure open, it should also be

Card 2/3

Colored etching of...

S/032/61/027/004/009/028
B110/B215

etched by standard reagents. [Abstracter's note: Complete translation.
Two colored figures cannot be reproduced]. There are 2 figures.

Card 3/3

PHASE I BOOK EXPLOITATION

SOV/6005

Pul'tsin, Nikolay Mikhaylovich

Titanovyye splavy i ikh primeneniye v mashinostroyenii (Titanium Alloys and Their Application in Machine Building) Moscow, Mashgiz, 1962. 166 p. 7000 copies printed.

Reviewer: Ya. M. Dityatkovskiy, Engineer; Ed. of Publishing House: A. I. Varkovetskaya; Tech. Ed.: L. V. Shchetinina, Managing Ed. for Literature on Machine-Building Technology (Leningrad Department, Mashgiz): Ye. P. Naumov, Engineer.

PURPOSE: This book is intended for designers, process engineers, and specialists in metal science. It may also be useful to students at schools of higher technical education.

COVERAGE: The book deals with problems of the physical metallurgy of titanium alloys. Basic phase diagrams, structures, and compositions of Soviet and non-Soviet titanium alloys are presented. Attention is given to the following: the effect of various im-

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Titanium Alloys and (Cont.)

SOV/6005

purities and alloying elements on titanium; problems connected with the heat treatment of titanium alloys; mechanical and physical properties of titanium alloys at room and elevated temperatures and the effect of various factors on these properties; problems of the corrosion resistance of titanium and its alloys; the advantages of titanium alloys over other materials; the application of titanium alloys in the machine building industry; and characteristics of basic methods of processing titanium alloys in machine-building. No personalities are mentioned. There are 109 references, mostly Soviet.

TABLE OF CONTENTS:

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Ch. I. Production and Properties of Titanium	7
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3. Effect of impurities on the structure and properties of titanium	15
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6201
S/149/62/000/005/007/008
A006/A101

18 1262

AUTHOR: Pul'tsin, N. M.

TITLE: On some structural and concentrational peculiarities of a modified layer in titanium alloys

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, tsvetnaya metallurgiya, no. 5, 1962, 137 - 140

TEXT: The authors studied the structure, hardness and chemical composition of the surface layer of some titanium alloys. The structure of this layer was modified by holding the titanium alloys in air atmosphere at high temperatures, so that their surface layer was saturated with oxygen and nitrogen. It was found that this layer was characterized not only by greater hardness and the presence of an alpha-affected zone but also by a content of alloying elements different from the core. Experiments made with a titanium alloy containing 4% Cr proved this concept to be correct. Micro-spectral analyses show that the Cr content increased from 2.40 in a depth of 0.075 mm to 4.32% at 0.825 mm distance from the edge. The presence of a contrasting alpha-affected zone in the modi-

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S/149/62/000/005/007/008
A005/A101

On some structural and concentrational...

tion layer is not necessary and depends on the structure of the alloy. This zone appears distinctly in an alloy with an α structure, while in an alloy with a structure of pure β -solid solution it is insignificant. In alloys with a structure of pure β -solid solution the modified layer and the core are not different at all. Saturation of the surface layer with α -stabilizers (air oxygen and nitrogen) causes the redistribution of alloying components as a result of the expulsion of α -stabilizers into deeper layers of the metal. Due to this redistribution the structure of surface and sub-surface layers is modified, entailing changes in the properties of these layers and in the part itself. Until the present, the modified layer was considered to be a negative factor. Contrary to this opinion the author believes that a surface layer with a modified composition of the basic alloying components may show a better quality than the base metal, especially in respect to corrosion. There are 3 figures. X

ASSOCIATION: Voenno-vozdushnaya inzhenernaya akademiya (Military-Aviation Engineering Academy)

SUBMITTED: December 25, 1961

Card 2/2

PUL'TSIN, N.M.; POKROVSKAYA, V.B.

Effect of heat treatment on the structure and hardness of a
titanium alloy with 4 % chromium. Fiz.met.i metalloved. 14
no.6:843-847 D '62. (MIRA 16:2)
(Titanium alloys--Heat treatment)

L 15579-63

EWP(q)/EWT(m)/EDS AFFTC/ASD JD/JG

ACCESSION NR: AP3000984

S/0149/63/000/002/0157/0161

AUTHORS: Pul'tsin, N. M.; Pokrovskaya, V. B.

63

TITLE: Surface layer on vacuum-annealed titanium alloys

59

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 2, 1963, 157-161

TOPIC TAGS: titanium alloy, vacuum annealing, surface layer, microstructure, vaporization

ABSTRACT: Two types of titanium alloys were subjected to annealing in evacuated quartz ampules at various temperatures and for various time periods. One alloy contained from 5 to 20% of chromium and was heated at 1100, 800, and 600C for 16, 200, and 200 hours respectively. The second alloy contained 0.5% chromium, 6% aluminum, and 5% of either iron or silicon. It was subjected to temperatures of 1100, 900, 700, and 500C for 4, 200, 300, and 500 hours. After cooling to room temperature, the samples were studied with a metallographic microscope. Their hardness was determined by Vickers' instrument. The chemical composition of the surface layer and core were analyzed by Korolev's local microspectral technique, with Korolev himself performing the tests. It was found that annealing caused the surface of the alloys to assume a corroded aspect, revealing a scattered micro-

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L 15579-63

ACCESSION NR: AP3000984

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crystalline structure. The hardness of the surface layer was higher than that of the core, and its chemical composition showed an enrichment in the alloying metals. This was due to volatilization of titanium, which was deposited on the inside surface of the ampule. Thus, the core of a 5% chromium alloy contained (after annealing) 8% of this metal, the composition of the core remaining unchanged. In an alloy containing 6% Al, 0.5% Cr and 5% Si annealing produced no significant changes in the Al and Si content of the surface layer while causing the impurities (Fe and Mo) to increase 40 and 100 times, respectively. The samples of alloys were supplied by I. I. Kornilov. The vacuum annealing of the samples was conducted with the assistance of V. S. Mikheyeva and T. S. Chernova. Orig. art. has: 4 figures.

ASSOCIATION: Voenno-vozdushnaya inzhenernaya akademiya (Military Air Engineering Academy)

SUBMITTED: 08Dec62

DATE ACQ: 21Jun63

ENCL: 00

SUB CODE: ML

NO REF SOV: 004

OTHER: 000

Card 2/2

PUL'TSIN, N.M., kand.tekhn.nauk

Increasing the resistance to corrosion of titanium alloys. Khim.mashinostr.
no.6:26-27 N-D '63. (MIRA 17:2)

ACCESSION NR: AT4007028 .

S/2598/63/000/010/0063/0070

AUTHOR: Pul'tsin, N. M.; Pokrovskaya, V. B.

TITLE: Results of metallographic and x-ray diffraction examination of AT-type titanium alloys

SOURCE: AN SSSR. Institut metallurgii. Titan i yego splavy*, no. 10, 1963. Issledovaniya titanovy*kh splavov, 63-70

TOPIC TAGS: titanium alloy, AT titanium alloy, AT titanium alloy structure, AT titanium alloy hardness, AT-3 titanium alloy, AT-4 titanium alloy, AT-6 titanium alloy, AT-8 titanium alloy, AT-9 titanium alloy, AT-10 titanium alloy, complex titanium alloy, titanium aluminum chromium alloy, iron containing alloy, silicon containing alloy, boron containing alloy

ABSTRACT: In continuation of earlier work by I. I. Kornilov and others, the authors investigated the microstructure, hardness and X-ray diffraction patterns of titanium alloys AT-3, AT-4, AT-6, AT-8, AT-9 and AT-10 having various phase compositions. Forged

Card 1/4

ACCESSION NR: AT4007028

cylindrical specimens were first subjected to thermal treatment under conditions selected on the basis of the phase diagram shown in Fig. 1 of the Enclosure. Metallographic examinations of these specimens by either the black-and-white method (etching with HF + HNO₃ or with H₂SO₄) or the color method described previously (Zav. lab., 1961, No. 4, p. 424) showed an α -solid solution of the interwoven or needle type in all cases. The precise type of structure was found to depend on alloy content (Al, Cr, Fe, Si, B), annealing temperature and rate of cooling during quenching. Normal X-ray analysis on the URS-70 machine confirmed that the alloys consisted mostly of the α phase; additional studies by means of the URS-50I machine permitted the construction of interference curves which revealed a small amount of the β phase (1-10% initially, 8-10% after normalization). Hardness determinations by means of the Vickers device with a load of 30 kg showed that the properties of the α -solid solution were different in each alloy, due possibly to a different degree of dispersion or to deformation of the crystal lattice. "The authors express appreciation to V. V. Obukhovskiy, I. I. Kornilov and V. S. Mikheyev for taking part in the work."

ASSOCIATION: Institut metallurgii AN SSSR (Metallurgical Institute, AN SSSR)

Card 2/4

ACCESSION NR: AT4007028

SUBMITTED: 00

DATE ACQ: 27Dec63

ENCL: 01

SUB CODE: MM

NO REF SOV: 007

OTHER: 000

Card 3/4

ACCESSION NR: AT4007028

Enclosure 01

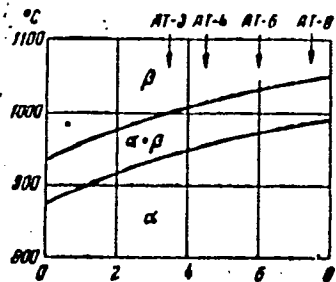


Fig. 1. Pseudobinary section of the phase diagram in the region of allotropic transformations of the alloys of the system Ti-Al-Cr-Fe-Si-B; total content of Cr-Fe-Si-B = 1.5-1.8%. Ordinate = temperature of °C; abscissa = wt. % Al.

Card 4/4

PUL'TSIN, N.M.; SAMOYLOV, N.S.; POKROVSKAYA, V.B.

Thermal fatigue of certain titanium alloys. Izv. vys. ucheb.
zav.; tsvet. met. 6 no.4:127-131 '63. (MIRA 16:8)

1. Voenno-vozdushnaya inzhenernaya akademiya.
(Titanium alloys--Fatigue)
(Thermal stresses)

L 17161-65 EWT(m)/EWA(d)/EPR/EWP(t)/EWP(b) Ps-4 IJP(c)/ASD(m)-3/SSD/
AFWL/AFETR MJW/JD/MLK
ACCESSION NR: AT4048079 S/0000/64/000/000/0240/0242 21

AUTHOR: Pul'tsin, N.M.; Rumako, M.P.; Pokrovskaya, V.B. 5/1

TITLE: The heat resistance of titanium alloy AT8 during short-term tests

SOURCE: Soveshchaniye po metallurgii, metallovedeniyu i primeneniyu titana i yego splavov. 5th, Moscow, 1963. Metallovedeniye titana (Metallography of titanium); trudy* soveshchaniya. Moscow, Izd-vo Nauka, 1964, 240-242

TOPIC TAGS: titanium alloy, creep, heat resistance, strength, oxidation, titanium aluminum alloy, AT8 alloy 14

ABSTRACT: In order to study the mechanical properties of AT8 alloy in relation to those of pure titanium and other titanium alloys, rectangular samples 2.7 mm thick, 10 mm wide, and 140 mm long, were placed in holders suspended in pendular fashion and heated by single-coil induction heaters fed with a high-frequency electric current. The temperature to which the samples were heated was measured by an optical pyrometer to an accuracy of $\pm 10C$. Experiments were carried out at temperatures of 800, 850, and 900C and stresses of 3-20 kg/mm². After each sample had been brought to the prescribed temperature, it was held there until it was fractured, the time necessary to effect fracture being noted; the samples were then subjected to microscopic analysis. In agreement

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L 17161-65

ACCESSION NR: AT4048079

2

with the data of previous experiments, the results show that a decrease in stress increased the time to rupture at constant temperature, while an increase in temperature at constant stress decreased the time to rupture. The rupture strength for a rupture life of 10 min was 5.5, 4.0, and 2 kg/mm² at 800, 850, and 900C, respectively. The total creep of the samples was similar at different temperatures, but was achieved much more rapidly at higher temperatures (20, 50, and 120 sec for comparable elongations at 880, 850, and 800C). Microscopic analysis of areas of greatest deformation, i.e., areas where the necking occurred, showed signs of striation and loosening of the material. There was no significant scale formation during the tests, due probably to the high Al content of At8 alloy. Since the experiments were conducted at temperatures far above the working temperature of AT8 and other titanium alloys, the data obtained may be used to predict the behavior of AT8 alloy in short-time operation at high temperatures. "The samples of alloy were prepared by I. I. Kornilov and V. S. Mikheyev." Orig. art. has: 2 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 15Jul64

NO REF SOV: 000

Card 2/2

ENCL: 00

SUB CODE: MM

OTHER: 000

ATD PRESS: 3149

ACCESSION NR: AP4029538

S/0149/64/000/002/0152/0154

AUTHOR: Pul'tsin, N. M.; Dityatkovskiy, Ya. M.; Pokrovskaya, V. B.; Vinogradov, V. A.

TITLE: On the character of the surface layer structure of VT5-1 titanium alloy during high-temperature heating

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 2, 1964, 152-154

TOPIC TAGS: VT5-1 titanium alloy, surface layer, titanium structure, high temperature heating, hardness, titanium, nitrogen, oxygen, solid solution

ABSTRACT: As is well known, titanium alloys undergo substantial changes in the structure and hardness of the surface layer under heating. These changes are caused by the effect of oxygen from the air diffused in the metal at a high temperature. Nitrogen has some effect, although it has less capacity to diffuse in the titanium. As has been previously shown (N. M. Pul'tsin. Izv. VUZ, Tsvetnaya metallurgiya, no. 5, p. 137 (1962)), substantial changes in the structure of the surface layer of α alloys during their saturation with oxygen does not occur; only an increase in hardness is observed due to the effect of oxygen in these alloys. The authors present some results of investigating the structure of the changed layer of monophase titanium alloy VT5-1 during high-temperature heating. It is established that as a
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ACCESSION NR: AP4029538

result of oxygen saturation from the air at a high temperature, the surface layer undergoes a visible microscopic structural change of the α solid solution. An illustration containing 9 microphotographs is presented to show the various changes of the surface under various conditions. The change in the structure of the surface layer without a change of the phase composition of the alloy is established. The structure of the changed surface layer and the transitional zone is distinguished in appearance from the structure of the core, although in all three regions it consists of one phase, i.e., the solid α solution. A solid solution of the surface zone has an equiaxial construction of the grains; however, the cores have a basket or fine-grained, nonequiaxial construction. This distinction in the surface is explained by the fact that the surface layer, strongly saturated with oxygen, does not undergo phase conversion in cooling after annealing, which cannot be said of the core and only partially of the transitional layer. Orig. art. has: 4 figures.

ASSOCIATION: Voyennaya inzhenernaya akademiya (Military Engineering Academy)

SUBMITTED: 03Jun63

DATE ACQ: 30Apr64

ENCL: 00

SUB CODE: ML

NO REF SOV: 001

OTHER: 000

Card 2/2

L 19713-65 EWT(m)/EWA(d)/EWP(v)/EWP(t)/T/EWP(k)/EWP(b) Pf-4 IJP(c)/ASD(f)-3/
ACCESSION NR: AP4047491 ASD(m)-3 MJW/JD/HM S/0149/64/000/004/0121/0123

AUTHOR: Onopriyenko, A. A.; Pul'tsin, N. M.

TITLE: Brazing of VT3-1 alloy to 1Kh18N9T and EI69 steels

SOURCE: IVUZ. ¹⁸Tsvetnaya metallurgiya, ¹⁸no. 4, ¹⁸1964, ¹⁸121-123 B

TOPIC TAGS: ²⁷titanium, titanium brazing, titanium stainless steel
brazing, brazing alloy, furnace brazing, high frequency brazing,
induction brazing

ABSTRACT: Four silver-base brazing alloys were tested in high-fre-
quency and furnace brazing of VT3-1 titanium alloy to 1Kh18N9T and
EI69 steels in vacuum or in argon atmosphere. An alloy containing
30% copper and 15% manganese yielded joints with the highest strength,
12.1 kg/mm², the most uniform structure, and a microhardness roughly
equal to that of VT3-1 alloy. Satisfactory results were also obtained
with pure silver and an alloy containing 30% copper and 10% tin. How-
ever, hard and brittle diffusion layers were formed in the pure sil-
ver-steel interface. These layers are thin in the HF-brazed joints
and have little effect on the joint properties, but in furnace-brazed

CONT 1B

L 19713-65

ACCESSION NR: AP4047491

joints the layers may reach a considerable thickness and bring about an embrittlement of the joints and a wide scattering of the strength values from 11 to 18 kg/mm². The copper in the silver-copper-tin alloy also may form brittle intermetallic compounds with titanium. However, no thick diffusion layers were observed in joints brazed with this alloy owing to its low melting temperature, 720C, at which diffusion proceeds at a low rate. The fourth alloy, containing 7% copper, 17.5% manganese, 3% nickel, and 0.5% silicon, yielded the least satisfactory results. At brazing temperature, β -titanium dissolves a considerable amount of manganese. Upon cooling, the solid solution decomposes with precipitation of a brittle intermetallic compound, which raises the microhardness of the brazed joint to 740 kg/mm². High-frequency brazing in argon was found to be the most suitable method, especially for brazing simply shaped parts in small lots. Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Voyennaya inzhenernaya akademiya (Military Engineering Academy)

...rd 2/3

L 19713-65

ACCESSION NR: AP4047491

SUBMITTED: 26Jul63

ENCL: 00

SUB CODE: MM

NO REF SOV: 000

OTHER: 000

ATD PRESS: 3160

Card 3/3

L 16905-65 EWT(m)/EWA(d)/EWP(t)/EWP(b) IJP(c)/ASD(f)-2/SSD/ASD(m)-3/AFTG(p)
ACCESSION NR: AP4049180 MJW/JD/WB S/0314/64/000/005/0028/0029

AUTHOR: Pul'tsin, N. M. (Candidate of technical sciences); Larionov,
V. A. (Engineer)

TITLE: Investigation of titanium-alloy strength in an aggressive medium

SOURCE: Khimicheskoye i neftyanoye mashinostroyeniye, no. 5, 1964,
28-29

TOPIC TAGS: titanium, titanium alloy, alloy property, VT14 alloy,
AT8 alloy, corrosion, stress corrosion, sulfuric acid

ABSTRACT: Tests have been conducted to determine the strength of the
VT14 and AT8 titanium alloys in an aggressive medium and to investi-
gate the effect of the surface layer formed as a result of gas
absorption during annealing at 880C for 0.5 to 2 hr. Alloys were
stressed to 92.5, 95, or 97.5% of their tensile strength, in 20%
sulfuric acid. AT8 alloy was found to be more resistant to the com-
bined effect of stress and corrosion. Under a stress of 95% of the
tensile strength, VT14 alloy failed in 30 min and AT8 alloy failed

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L 16905-65
ACCESSION NR: AP4049180

in 3 hr 15 min. Under a stress of 92.5% of the tensile strength, neither alloy failed after 24 hr. The surface layer formed under the effect of heat treatment increases the strength of both alloys in the aggressive medium. In tests under a stress of 95% of the tensile strength, a layer 0.105 mm thick increased the life of VT14 alloy to 1 hr 15 min, and a layer 0.11 mm thick increased the life of AT8 alloy to 22 hr. The greater strength of the AT8 alloy can be explained by its higher aluminum content. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MM

NO REF SOV: 000

OTHER: 000

ATD PRESS: 3150

Card 2/2

L 34517-65 EWP(k)/EWA(c)/EWT(m)/EWP(b)/EWP(t)/T Pf-4 IJP MJW/JD/HW/GS

ACCESSION NR: AT4048083

S/0000/64/000/000/0263/0267 26

AUTHOR: Dityatkovskiy, Ya. M., Pul'tsin, N. M., Pokrovskaya, V. B., Vinogradov, V. A. 25 26 27 28 29 30 31

TITLE: Some investigations of the properties and structure of alloy VT5-1^B during hot stamping

SOURCE: Soveshchaniye po metallurgii metallovedeniyu i primenaniyu titana i yego splavov. 5th, Moscow, 1963. Metallovedeniye titana (Metallography of titanium; trudy* soveshchaniya. Moscow, Izd-vo Mauka, 1964, 263-267

TOPIC TAGS: titanium alloy, titanium alloy heating, titanium alloy structure, hot pressing, titanium oxidation, titanium alloy hardness/alloy VT5-1

ABSTRACT: Hot working of titanium alloys is hampered by their chemical activity at high temperatures. Titanium reacts with the oxygen of the air and the other air components are dissolved in the metal, forming scale and increasing the hardness and brittleness at the surface. The defects must be eliminated by turning on lathes. The problem of loss of metal during stamping requires special investigations to determine the optimal heating temperature which will insure the needed plasticity and minimum waste. The waste may be measured by the increase in billet weight during heating. The present paper investigated the added weight, The depth and properties of the changed layer of the

1/3
Card

L 34517-65

ACCESSION NR: AT4048083

VT5-1 alloy surface, and the alloy structure. Wedge-shaped samples were used for testing. The results showed that the VT5-1 alloy should not be heated above 1100C for forging and stamping as the metal waste increases tremendously at these temperatures. Prolongation of the heating process leads to decreased weight gain. This is explained by retardation of the saturation process. The diffusion of admixtures through the surface layer is lowered. When the temperature is increased during prolonged heat treatment, however, the decrease in the weight gain becomes less significant. Thus, at 900C, when the heating duration changes from 1/2 to 2 hours, the weight gain drops by about 66%, while at 1100C, the drop is only about 29%. This is caused by the higher diffusion at higher temperatures. Metallographic investigations confirmed previously published reports on the increase in hardness and depth of the titanium surface layer. The paper concludes that heating at temperatures above 800C, and especially above 1100C, leads to increases in weight of the alloys. Heating of the VT5-1 alloy in air at different temperatures leads to the formation of a variable surface layer, the depth, microhardness and structure of which depend on the heating duration. The highest microhardness is observed at the highest temperatures. The visible structure of the surface layer differs from the structure at the core, even though there are no actual differences in structure.

Card 2/3

L 34517-65 -

ACCESSION NR: AT4048083

as the titanium consists of α -solid solutions throughout the entire depth. The solid solution at the surface has an equiaxial structure, while the core has a fine-grain non-equiaxial structure. This difference is caused by oxygen saturation of the surface layer, which prevents phase transformations. The formation of the surface layer, even though it is thin, causes cracks to form in the material while working, and possibly during operation. Orig. art. has: 2 figures and 2 tables. "Ye. A. Bodrova took part in the metallographic investigations."

ASSOCIATION: none

SUBMITTED: 15Jul64

ENCL: 00

SUB CODE: MM

NO REF SOV: 002

OTHER: 000

Card 3/3

L 57736-65 EWI(d)/EWI(m)/EWP(w)/EWA(d)/EWP(v)/T/EWP(t)/EWP(k)/EWP(h)/EWP(z)/
EWP(b)/EWP(l) Pf-4 IJP(c) MJW/JD

ACCESSION NR: AP5017098

UB/0032/65/031/007/0885/0886
620.171:1.05

32
29
B

AUTHOR: Pul'tsin, E. M. + Larionov, V. A.

TITLE: Device to measure the deformation of specimens under load-carrying tests for short-term resistance to high temperatures

SOURCE: Zavodskaya laboratoriya, v. 31, no. 7, 1965, 885-886

TOPIC TAGS: load carrying test, analog converter, deformation rate, pressure pickup, tensile impact testing machine, creep curve, high temperature, short term test

ABSTRACT: During short-term load-carrying tests for resistance to high temperatures the processes of creep in the material develop very rapidly so that normally the increase in deformation with time cannot be traced. Oscillographic examination also is not always possible in such cases. Therefore, the authors developed an analog for converting linear dimensions to electrical quantities which makes it possible to plot creep curves during such short-term tests without resorting to an oscillograph. The device (Fig. 1) consists of pickup 1 and bracket 2 attached to clamps 3 of the testing machine. The pickup used is a somewhat modified pressure

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L 57736-65

ACCESSION NR: AP5017098

2

pickup (100 kg/cm²). Stretched between bracket 2 and lever 4 is synthetic-fiber string 5. The loading system of the pickup is of the leverage type. The device is provided with power supply source 6 and 17-mv millivoltmeter 7 with a mirror dial as well as a set of V-13-T type adjusting potentiometers 8. The pull on the lever system and its return to initial position are assured by springs 9. By altering the length of the AB arm of the pickup lever virtually any magnitude of deformation of specimen 10 can be measured with the same relative accuracy. The device is mounted in a tensile impact testing machine and calibrated in order to plot a calibration curve for use in determining deformation in unit lengths. The readings of the millivoltmeter are recorded at intervals of time adapted to the deformation rate of the specimen, the deformation rate itself being determined by the stress applied and the test temperature. (In these experiments the intervals were 3 and 5 sec.) Then, on the basis of the calibration curve, the readings are converted to deformation in millimeters and creep curves are plotted. On this basis, AT8 titanium alloy was subjected to short-term tests of resistance to high temperatures (Fig. 2). The creep curves thus plotted are identical with the customary creep curves obtained in longtime tests of the same kind. The article does not specify the means by which the high temperatures were generated. Orig. art. has: 2 figures.

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L 57736-65

ACCESSION NR: AF5017098

ASSOCIATION: Leningradskaya voyennaya akademiya im. A. F. Mozhayshogo (Leningrad Military Academy)

SUBMITTED: 00

ENCL: 02

SUB CODE: NM, MT

NR REF SOV: 000

OTHER: 000

Card 3/5

PUL'TSIN, N.M.

Classification of titanium alloy constitutional diagrams. Fiz. met.
i metalloved. 18 no.2:245-250 Ag '64.

(MIRA 18:8)

1. Leningradskaya voyennaya inzhenernaya Krasnoznamennaya akademiya
imeni A.F.Mozhayskogo.

BUKIBIN, N.M.; DANTONOV, V.V.

Distribution of air components between the scale and the altered layer of certain titanium alloys. Izv. vys. ucheb. zav.; tsven. met. 8 no.5:131-134 '65. (MIR: 18.10)

1. Voyennaya inzhenernaya akademiya.

ACC NR: AP6033496

SOURCE CODE: UR/0413/66/000/018/0119/0119

INVENTOR: Pul'tsin, N. M.; Larionov, V. A.

ORG: None

TITLE: An installation for testing sheet materials. Class 42, No. 186178

SOURCE: Izobret prom obraz tov zn, no. 18, 1966, 119

TOPIC TAGS: sheet metal, fatigue test, stress corrosion, hydraulic device, vibration stress

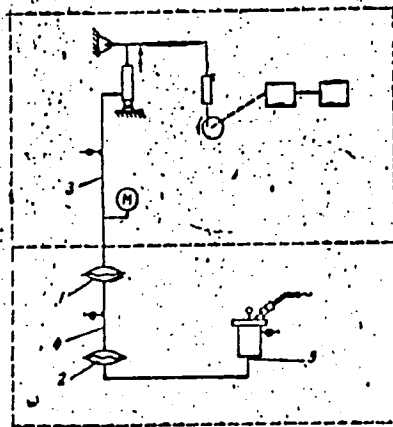
ABSTRACT: This Author's Certificate introduces: 1. An installation for fatigue testing sheet materials in a highly active liquid aggressive medium. The unit contains a loading device made in the form of a hydraulic cylinder with oil as the working fluid, an operational chamber with the aggressive medium holding the specimen to be tested which receives a low-frequency pulse from the hydraulic cylinder, and a pipeline connecting the cylinder to the chamber. The destructive action of the aggressive medium on the components of the installation is prevented by sequential placement of diaphragm type hydraulic separators in the pipeline to form three mutually isolated sections. These sections are filled (counting from the hydraulic cylinder toward the working chamber) with oil, water and the aggressive medium which receives the pulse from the hydraulic cylinder and acts directly on the specimen to be tested. 2. A modification of this installation in which a wide range of stresses is provided for testing the specimen by using a high-frequency vibrator, e. g. an electromagnet, mounted

Card 1/2

UDC: 620.178.3:621.9-412

ACC NR: AP6033496

on the working chamber to apply additional vibrations to the specimen.



1 and 2--hydraulic separators; 3--section with oil; 4--section with water; 5--section with the aggressive medium

SUB CODE: 13/ SUBM DATE: 27May65

Card 2/2

L 27869-66 EWT(m)/EPF(c)/EWA(d)/EWF(t)/EWF(z)/EWF(b) IJP(c) MJW/JD/WB

ACC NR: AP5027101

UR/0149/65/000/005/0131/0134
669.295

28
20
B

AUTHOR: Pul'tsin, N. M., Larionov, V. A.
44.53 44.55

TITLE: Distribution of air components between the scale and the altered layer of certain titanium alloys
44.53, 21

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 5, 1965, 131-134

TOPIC TAGS: titanium alloy, metal oxidation, oxygen, metal scaling, aluminum containing alloy, gas diffusion
16

ABSTRACT: During its heating in connection with forging, stamping, annealing, and other types of heat treatment, Ti undergoes considerable oxidation, which involves scale-formation and the diffusion of the air's components in the metal. In this connection, the authors investigated the distribution of gaseous impurities (chiefly oxygen) between the scale and the underlying altered (contaminated) layer of the Ti alloys OT4, VT5-1, VT6, AT8, and VT14. The specimens were heated to 880°C (which is very close to the $\alpha \rightleftharpoons \beta$ transformation temperature of pure Ti) in an electric muffle furnace with an air atmosphere, over different intervals of time (0.5, 2, and 5 hr), with subsequent cooling as well as with separate weighing of the scale. Findings: The alloys that undergo the greatest oxidation are OT4, VT5-1, and VT6, whereas the

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L 27869-66

ACC NR: AP5027101

alloys AT8 and VT14 oxidize relatively little and scale the least. This is mainly associated with the effect of Al²⁷ as an alloy element which raises the temperature of allotropic transformation. Thus, the alloys OT, VT5-1, VT6, and VT14 contain 2.8, 4.8, 5.5, and 4% Al, respectively, while the alloy AT8 contains ~7% Al. The weight gain due to diffusion and the formation of a gas-saturated altered layer proved however, to be unexpectedly high in the alloy AT8. This is apparently also attributable to its high Al content, since the higher the content of Al -- which raises the temperature of allotropic transformation, -- is, the greater will the amount of the α -phase in the alloy at 880°C be and the faster will the rate of diffusion of the gaseous impurities be, since their solubility in the α -solid solution is much greater than in the β -solid solution. It is further established that up to a point, the longer the duration of heating, the slower the rate of the diffusion of gaseous impurities and the faster the rate of scale-formation are and vice versa. Thus, the difference in weight between the initial specimen and the specimen after heating and following removal of scale may serve both as a qualitative criterion of the ability of alloys to oxidize with scale-formation and as an index of the ratio between the oxygen in the scale and the oxygen in the altered layer. Orig. art. has: 3 figures. 8

ASSOCIATION: Voyennaya inzhenernaya akademiya (Military Engineering Academy) 4455

SUBMITTED: 13Mar64

ENCL: 00

SUB CODE: MM, SS

NO REF SOV: 003

OTHER: 000

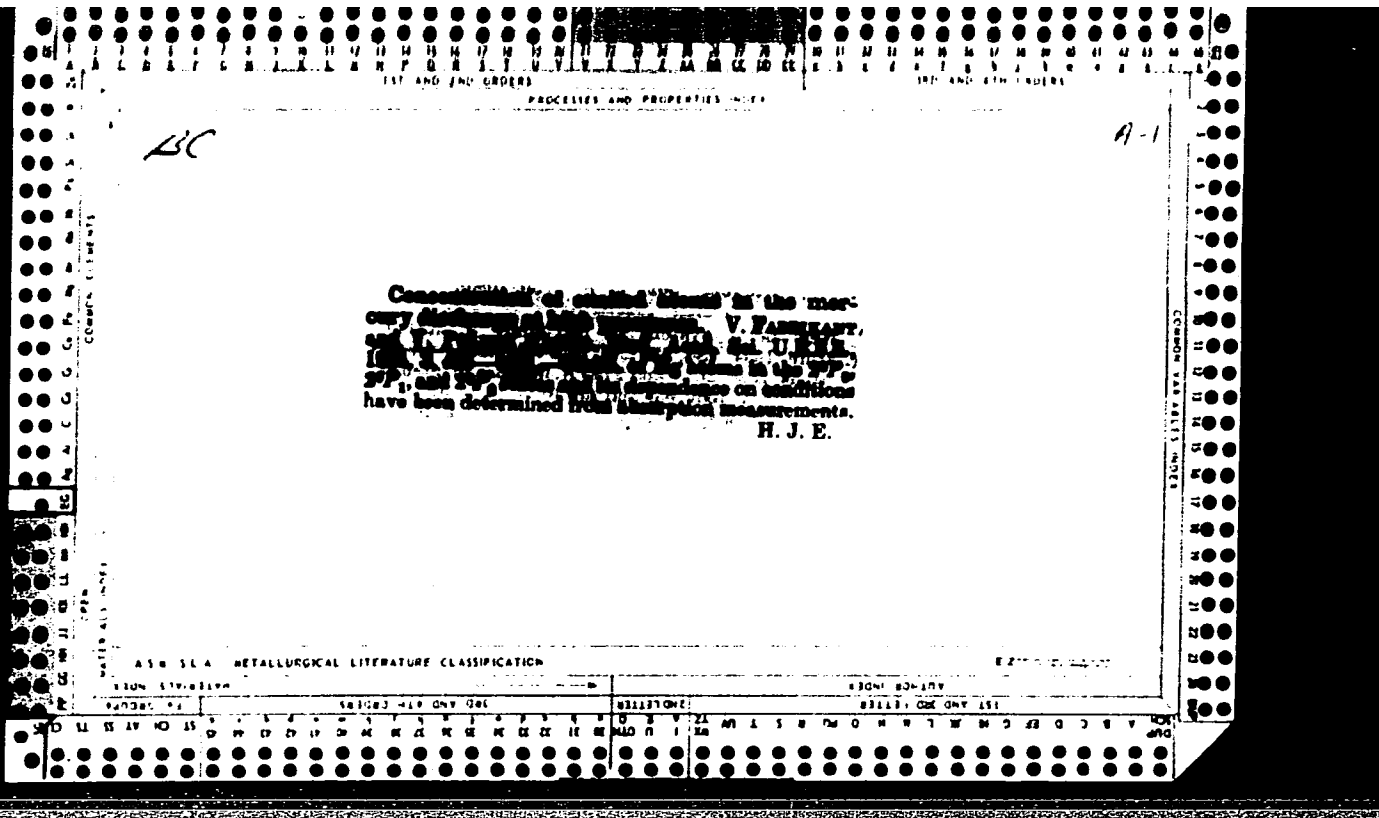
Card 2/2 20

CA

3

Concentration of excited atoms in the mercury discharge at high pressure. V. Fabrikant and V. Pul'ver. *Comp. rend. Acad. sci. U. R. S. S.* 3, 435-8 (in German 439-42); *Physik. Z. Sowjetunion* 6, 521-30 (1934). — Measurements have been made of the relative intensities of emission and absorption in the pos. column of the triplet 5460.74, 4968.37 and 4040.56 Å, and the lines 5790.66 and 5789.60 Å. of Hg. These measurements were made at currents of 5.0-7.5 amp. and pressures of 250-820 mm. Hg. The absorption measurements indicate a very high concn. of the $2^1P_{1,2}$ levels and no change in concn. occurring with variation in current indicated that satn. conditions were attained. The increasing absorption of the 5790.66 and 5789.60 Å. lines with increasing current indicates a rapid increase of concn. of the 2^1P_1 levels. The production of these levels may occur through (1) direct excitation from the ground state, (2) stepwise excitation from the levels $2^3P_{1,2}$ and (3) the filling up by cascade by transition from the 3^1D_2 , 3^1D_1 , 3^1D_0 , and other levels. The ratio of the concns. (N_i) of the absorbing centers in the 3 levels 2^1P_2 , 2^1P_1 and 2^3P_1 is: $N_2:N_1:N_3 = 100:144:12$.
H. A. Smith

ASTM S.L.A. METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

A-53
2

SA

5166. Concentration of Excited Atoms in Hg Discharge at High Pressures. V. Fabrikant and V. Palmar. *Comptes Rendus de l'Acad. des Sciences, U.R.S.S.* 3. pp. 435-442, Aug. 21, 1934. In German.—By measuring the absorption and intensity of the visible Hg lines in the positive column of a high-pressure Hg discharge in a direction at right angles to the axis of a cylindrical tube and for various current strengths, the concentration of the Hg atoms in the 2^1P_1 , $2^1P_1'$, $2^1P_1''$, and $2^1P_1'''$ states is determined. In each case a linear increase with current strength is found. The concentrations do not agree with those derived from the Boltzmann distribution; other workers are in agreement on this point. H. J. H. S.

METALLURGICAL LITERATURE CLASSIFICATION

SELECTED

LOKSHIN, I.A.; SULTANOV, S.A.; PULUYAN, I.G.

Present status of the development of the Bavly oil field.
Geol.nefti 2 no.3:5-13 M^r '58. (MIRA 12:6)

1. Upravleniye neftyanoy promyshlennosti Tatsovnarkhoza.
(Bavly District--Oil fields--Production methods)

PULUZ'YAN, A., kand.ekonom.nauk

Economic problems in the production of 675 and 676 milling machines.
Prom.Arm. 6 no.10:29-32 0 '63. (MIRA 17:1)

PUL'TSIN, N.N., kand. tekhn. nauk; LARIONOV, V.A., inzh.

Investigating the strength of titanium alloys in test in an
aggressive medium. Khim. i neft. mashinostr. no. 5:28-29 N '64
(MIRA 18:2)

PULUZ'YAN, A., kand.tekonomicheskikh nauk

"Organization of production and work in machine manufacture".
by A. Ovsepian. Reviewed by A. Puluz'ian. Prom.Arm. 5 no.9:70-73
S '62. (MIRA 15:9)
(Machinery industry) (Industrial management)
(Ovsepian, A.)

PUL'VER, K. I.

Control of the poisonous spider kara-kurt (*Lathrodectes tredecim-*
guttatus Rossi). Med. paraz. i paraz. bol. no.6:743-746 '61.
(MIRA 15:6)

1. Iz otdela malyarii i meditsinskoy parazitsinskoy parazitologii
Odesskoy oblastnoy sanitarno-epidemiologicheskoy stantsii
(glavnyy vrach Ye. K. Panskiy, zav. otdelom A. S. Engel'shteyn)

(SPIDERS) (PESTICIDES)

SELENS, Yu.Ye.; PUL'VER, K.Yu.

Possibilities for chemical control of the black wolf spider
(*Latrodectus tredecimguttatus* Rossi). Ent. oboz. 40 no.4:
842-847 '61. (MIRA 17:1)

1. Kafedra entomologii i zoologii Odesskogo sel'skokhozyast-
vennogo instituta i Odesskaya oblastnaya sanitarno-epidemi-
ologicheskaya stantsiya.

Pulver, V. L.

1993

OPTICAL INVESTIGATION OF THE DISCHARGE IN METALLIC VAPOURS. 1. THE RELATION BETWEEN THE CONCENTRATION OF EXCITED ATOMS AND THE CURRENT INTENSITY IN A HIGH PRESSURE MERCURY DISCHARGE. (Optische Untersuchung Der Entladung in Metaldampfen I Die Abhangigkeit Der Konzentration Angeregter Atome Von Der Stromstärke In Der

3

Hochdruckquecksilberentladung). V. A. Fabrikant and V. L. Pulver. Translated from Physik. Z. Sowjetunion 6, 311-36, (1953), 11p. (TIB/T4133A)

The absorption and intensity of visible lines in a high-pressure discharge were measured, with constant concentration of the Hg vapor, for various current intensities using Hg-A lamps with oxide cathodes. Constant absorption and linear increase in the intensity of the visible triplet with increasing current intensity were established. The results showed that the concentrations of atoms at the levels 2^3P_0 , 2^3P_1 , and 2^3P_2 are related to each other in the proportion 100 to 144 to 120 and remain constant for variations in the current intensity from 5 to 7.5 amp. (J.A.G.)

AUTHORS: Aven, O. I., Domanitskiy, S. M., ^{103-19-3-8/9} ~~Pulyar, Yu. M.~~ (Moscow)

TITLE: A Linear Induction Potentiometer for General Industrial Determinations (Induktsionnyy lineynyy potenciometr obshchepromyshlennogo naznacheniya)

PERIODICAL: Avtomatika i Telemekhanika, 1958, Vol. 19, Nr 3, pp.268-279 (USSR)

ABSTRACT: An induction potentiometer is described here. It especially serves as a substitute for the measuring slide wire in systems of control and regulation. The potentiometer has a maximum angle of rotation of $180^{\circ} (\pm 90^{\circ})$. Then follows the description of the potentiometer and the method for its calculation. The fundamental formulae given in Ref 2 are used in the calculation. Here the calculation is given for the case where the feed voltage U_1 , the magnitude of the maximum secondary voltage U_{2max} according to the modulus, z_2 load - loading resistance, $(\pm \delta U_2)_{max}$ - the effective component of the maximum error of the potentiometer (coincides with U_1 of the phase) (taken in relation to U_{2max} in relative units) are given. The fundamental di-

Card 1/2

103-19-3-8/9

A Linear Induction Potentiometer for General Industrial Determinations

mensions of the potentiometer, the number of windings, the wire diameter of the primary and the secondary winding are determined. The magnitudes of the primary current and of the secondary current as well as the voltages at the output are calculated for the mode of operation under load. - The magnetic system assumed here permits to construct a linear induction-potentiometer for general industrial purposes. The results of the current- and voltage-calculations of actual constructions under various methods of operation agree with the experimental data. The characteristics of these potentiometers surpasses those of the contactless position indicators with regard to the domain of linearity of the characteristics, their symmetry, as well as the low unbalanced residual voltages in the compensation scheme. There are 11 figures and 3 references which are Soviet.

SUBMITTED: July 20, 1957

Card 2/2

L 00644-67

ACC NR: AP6005320

SOURCE CODE: UR/0413/66/000/001/0055/0055

AUTHOR: Pul'yer, Yu. M.

47
E

ORG: none

TITLE: A noncontact asynchronous variable multiphase electric motor. Class 21, No. 177522

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 1, 1966, 55

TOPIC TAGS: electric motor, ~~direct current~~ dc Amplifier, circuit design, RC circuit, resistance bridge

ABSTRACT: This Author Certificate presents a noncontact asynchronous variable multiphase electric motor with power supplied from a direct current source by a circuit using amplifiers. This design increases the motor's efficiency. The stages of the stator winding are made with a center tap and form, together with the variable RC (or RL) circuit, phase-shifting bridge circuits (see Fig. 1). The bridge circuits are interconnected in a closed circular sequence via the amplifiers in such a way that the voltage from the bridge diagonal (formed by each preceding stage) enters the input of the amplifier loaded by each subsequent stage.

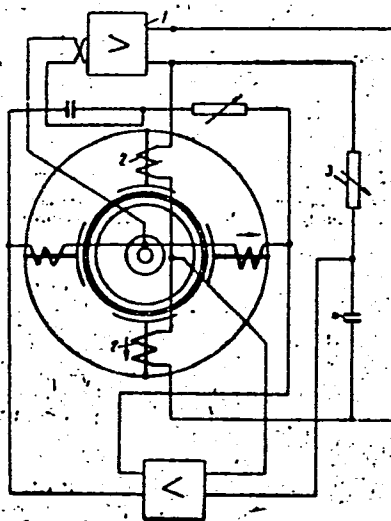
Card 1/2

UDC: 621.313.392

L 00644-67

ACC NR: AP6005320

Fig. 1. 1 - amplifiers; 2 - stages of the stator winding; 3 - variable resistors R; 4 - capacitors C



Orig. art. has: 1 figure.

SUB CODE: 09/ SUBM DATE: 25Jul64.

Card 2/2 fv

PULYARKIN, V.A.

Reflection of the geographical characteristics of a country
in the distribution and work of railway lines; based on the
example of West Pakistan. Vop. geog. no.61:192-200 '63.
(MIRA 16:6)

(Pakistan--Geography)

(Pakistan--Railroads--Construction)

PULYARKIN, Valeriy Alekseyevich; POPOV, K.M., doktor ekon.
nauk, otv. red.; LAVRENT'YEVA, Ye.V., red.

[Afghanistan; its economic geography] Afganistan; ekonomicheskaya geografiya. Moskva, Mysl', 1964. 253 p.
(MIRA 18:4)

DOLGOPOLOV, G.V.; KAZANSKIY, N.N.; KRYUCHKOV, V.G.; MAYERGOYZ, I.M.;
MINTS, A.A.; NAZAREVSKIY, O.R.; PETRYAYEVA, D.A.; POKSHISHEVSKIY,
V.V.; PRIVALOVSKAYA, G.A.; PULYARKIN, V.A.; RYAZANTSEV, S.N.;
FREYKIN, Z.G.; KHOREV, B.S.

Gennadii Petrovich Matveev; obituary. Izv. AN SSSR. Ser.geog.
no.6:144-145 N-D '62. (MIRA 15:12)
(Matveev, Gennadii Petrovich, 1926-1962)

PULYARKIN, Valeriy Alekseyevich; POPOV, K.M., doktor ekon. nauk,
otv. red.; SHAPOSHNIKOV, A.D., red.; MARTYNOVA, V.A.,
mladshiy red.; KISELEVA, Z.A., red. kart; KOSHELEVA,
S.M., tekhn. red.; VILENSKAYA, E.N., tekhn. red.

[Western Pakistan; economic geography] Zapadnyi Pakistan;
ekonomiko-geograficheskaya kharakteristika. Moskva,
Geografiz, 1962. 259 p. (MIRA 15:10)
(Pakistan--Economic geography)

SOV/10-59-1-29/32

AUTHORS: Oskolkova, O.B., and Pulyarkin, V.A.

TITLE: Lectures by Professor Chatterji in the Moscow State University imeni M.V. Lomonosov (Lektsii professora Chatterdzhii v Moskovskom gosudarstvennom Universitete imeni M.V. Lomonosova)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya geograficheskaya, 1959, Nr 1, pp 157-158 (USSR)

ABSTRACT: In response to the invitation from the Ministry of High Education, Professor of the University of Calcutta and President of Indian Geographic Society, Shiva Prasad Chatterji, visited the USSR in Aug-Sep 1958 and delivered a series of lectures at the Department of Geography of the Moscow University, on the physical and economic geography of India.

Card 1/1

PULYAYEV, M. I.

"The Rapid Development in Cattle Raising and the Increase of Agricultural Produce."

report presented at a meeting of scientists, agricultural workers and directors of the All-Union Agricultural Exhibition (VSKhV) (Nauka i zhizn', 1958, pp.33-41) Moscow, 1958.

M. I. Pulyayev, Dir. of Sovkhoz "Rogachik"

PULYAYEVSKAYA, N.V.; BALAGINA, G.M.

Comparative histological and histochemical study of the
genital canals in some nematodes of the suborder Ascaridata.
Trudy Gel'm. lab. 15:120-126 '65 (MIRA 19:1)

BOGOYAVLENSKIY, Yu.K.; FULYAYEVSKAYA, N.V.

Recent data on the histological structure of the cuticle and
hypodermis in *Diectophyme renale* (Goeze, 1782). Trudy Gel'm.
11:50-53 '61. (MIRA 15:12)
(*Diectophyma renale*) (Skin)

FULYAYEVSKIY, P.G.

Abnormal development of a fifth limb. Khirurgiia Supplement:55
'57. (MIRA 11:4)

1. Iz polikliniki No.2 g. Noril'ska Krasnoyarskogo kraja.
(EXTREMITIES, LOWER--ABNORMITIES AND DEFORMITIES)

PUL'VER, Yevgeniy Aleksandrovich; VOROTNIKOVA, R.V., red.

[Get acquainted with Voronezh; a reference guidebook]
Znakom'tes' s Voronezhem; putevoditel'-spravochnik. Vo-
ronezh, Tsentral'no-Chernozemnoe knizhnoe izd-vo, 1965.
269 p. (MIRA 18:11)

L 42924-66 EWT(d)/FSS-2/FPC(k)-2 BC

ACC NR: ATCC20544

SOURCE CODE: UR/2649/65/000/211/0043/0063

AUTHOR: Pul'yer, Yu. M. (Doctor of technical sciences); Kolesov, Yu. A. (Engineer)

ORG: none *

TITLE: Investigation of contactless induction pickups for gyroscopic systems |

57
BT/

SOURCE: Moscow. Institut inzhenerov zheleznodorozhnogo transporta. Trudy, no. 211, 1965. Konstruktivnyye elementy i sistemy avtomatiki (Hardware and automatic control systems), 43-63

TOPIC TAGS: gyroscope system, gyroscope component, transformer, magnetic circuit, magnetic core, magnetic induction

ABSTRACT: The article is devoted to theoretical design calculations for a differential transformer-type inductive pickup with a shell-type core as an example and for a self-synchronizing pickup of the microsyn type. The calculations consist of a determination of the main volt-ampere and current-flux characteristics as functions of rotor angle with allowance for the variation of the air-gap reluctance and leakage flux, and a determination of the reactive torque as a function of the deflection angle. The calculations show that the presence of fringing reluctance, which varies in nonlinear fashion with the rotor angle, and the limited magnetic susceptance of the magnetic core, cause a reactive torque to appear in the system and to distort the linear dependence of the no-load output voltage. The calculations and design formulas can be used to design inductive pickups of this type for gyroscopic systems.

Card 1/2

L 42924-66

ACC NR: AT6020544

Orig. art. has: 7 figures, 26 formulas, and 2 tables.

SUB CODE: 09/^{17/} SUBM DATE: 00/ OTH REF: 001

Card

2/2

A-dk

AVEN, O.I. (Moskva); DOMANITSKIY, S.M. (Moskva); PUL'YER, Yu.W. (Moskva).

Linear induction potentiometer for industry-wide use [with summary
in English]. Avtom. i telemekh. 19 no.3:268-279 Apr '58. (MIRA 11:4)
(Inductance)

Dr. Zel, Yu M.

Basic correlations and some problems of precision in linear induction
potentiometers. Trudy Inst. mash. Sem. to tech. v mash. i prib.
no. 9: 21-51 '57. (MLPA 10:9)

(Potentiometer)

YU. M. PUL'YER, Yu. M.

AUTOMATIC COMPUTERS

"Electric Angle Errors and Residual Voltages in Inductive Computing Elements," by Yu.M. Pul'yer, Avtomatika i Telemekhanika, No 6, June 1957, pp 536-550

The principal errors of the measuring and sensing elements used in induction computing devices are investigated, taking into account the technology used in the manufacture of such devices. Equations are obtained for the angular errors, for the electrical (amplitude and phase) errors, and for the residual voltages of sine-cosine resolvers as functions of air-gap irregularities and of the losses in the steel. An estimate is made of the residual voltage in induction tachometer generators, resulting from variations in rotor thickness. The mathematical methods employed make it possible to obtain a more general analysis for the influence of structural and technological errors in the mechanical portion, and also the influence of the characteristics of the magnetic materials on the electrical errors of induction-type elements.

Card 1/1

- 1 -

POLYMERIZATION, E.

133. **Irradiation Treatment of Sweat-gland Abscesses.**
(Zur Strahlenbehandlung der Schweißdrüsenabszesse)
E. PULVERMÄCHER. *Strahlentherapie [Strahlentherapie]*
78, 93-98, 1948. 21 refs.

The apocrine glands of the axillary and pubic regions have alkaline secretions in contrast to the acid secretions of the ordinary sweat glands; the reaction of the secretion is considered by the author to be the main factor in the production of abscesses in these regions. A variable dosage of x rays was used in treatment, epilation being always attempted. Recently the author has used 200 r on three occasions at intervals of 3 to 4 days, hard rays being employed as in deep therapy. Between 1941 and 1948, 116 patients were treated; 56% of patients were women, all in the reproductive period. In 31, abscesses were bilateral.

Only 82 of the patients were adequately followed up, and these are considered in more detail. In the group mildly affected there were 39 cases, in 10 of which a stab incision had been made. In the 22 cases of moderate infection several incisions had previously been made. The 13 patients with severe infection had had numerous incisions before irradiation. All these 74 patients (90% of the series) became symptom free within a short period, except that in 5 cases of moderate infection an incision was required after irradiation. In 8 cases treatment was not successful. In 3 of these there was associated generalized furunculosis, and 5 patients were seen after the infection had been present for a considerable period.

W. J. Czyzewski

1

M

*Relationships in the Variations of the Properties of Solid Solutions. A. P. Pulyaev and E. F. Trusova (*Zhur. Tekhn. Fiziki*, 1950, **20**, (1), 66-78). [In Russian]. Alloys of aluminium with Zn, Ag, Mg, Si, and Cu; of iron with Si, Cr, Mn, Ni, Mo, and W; and of copper with Zn, Ni, Al, Mg, Si, Mn, and Sn were investigated by observing the variations in mechanical and electrical properties resulting from the distortion of the crystal lattice of the solvent caused by the presence of the solute (alloying element). These distortions (dilatations and compressions) harden the solid solution the more, the higher the degree of distortion, compression being more efficacious in this respect than dilatation. The relative hardening depends on the nature of the alloying element, but not on the nature of the metallic solvent. Norbury's rule (*J. Inst. Metals*, 1925, **33**, 91) may be applied to the alloying elements of group I with fully developed internal electron orbits and to the elements of group II. Alloys containing transition elements do not obey the rule. R. E. K.

Sept. 1950

PULYAKH, A.I.

KAPSHUKOV, Stepan Gavrilovich; ZASLAVSKIY, B.Ye., red.; PULYAKH, A.I., red.
SLEDNEV, I.P., red.; SOLOMONIK, R.L., tekhn.red.

[The struggle of the Bolshevik party for the army during the first
World War, 1914 - March 1917] Bor'ba bol'shevitskoi partii za
armiiu v period Pervoi Mirovoi voiny, 1914 g. - mart 1917 g.)
Moskva, Voen. izd-vo M-va obor. SSSR, 1957. 162 p. (MIRA 11:2)
(Communist Party of the Soviet Union--Party work)
(Russia--Army)

Polyn. kin. VA

ALAMPYEV, P.M.; GERASIMOV, I.P.; GORNUNG, M.B.; GOKHMAN, V.N.; ZHIRMUNSKIY,
M.M.; KOVALEVSKIY, V.P.; KULAGIN, G.D.; MILEYKOVSKIY, A.G.; NEYSHTADT,
M.I.; POPOV, K.M.; PULYARKIN, V.A.

A.S. Dobrov; obituary. P.M. Alampiev and others. Izv. AN SSSR. Ser.
geog. no.4:143-144 J1-Ag '57. (MIRA 11:1)
(Dobrov, Aleksandr Semenovich, 1901-1957)

FILIPKIN, V. A.

FILIPKIN, V. A. --"Kashmir (Geographic Characteristics),"*(Dissertations for
Degrees in Science and Engineering Defended at USSR Higher Educational Institutions)
Acad of Sci USSR, Inst of Geography, Moscow, 1955

SO: Knizhnyy Leksikon. No. 25, 14 Jun 55

* For Degree of Candidate in Geographical Sciences