TSIMMERMAN, Genrikh Solomonovich.

Academic degree of Doctor of Medical Sciences, based on his defense, 12 October 1954, in the Council of the Central Inst for the Advanced Training of Physicians, of his dissertation entitled: "Clinical Otoneuralogy."

Academic degree and/or title: Doctor of Sciences

SO: Decisions of VAK, List no. 13, 4 June 55, Byulleten' MVO SSSR, No. 15, Aug 56, Moscow, pp. 5-24, Uncl. JPRS/NY-537

TSIMMERMAN, G.S., doktor med. nauk (Moskva)

Meniere's disease [with summary in English]. Vest.oto-rin. 20 no.1:49-53 Ja-F '58. (MIRA 11:3)
(MENIERE'S DISEASE
manifest. & ther. (Rus)

TSIMMERMAN, G.S., doktor meditsinskikh nauk

Survey of some articles published in "Otolaryngologia Polska" in 1958. Vest. otorin. 22 no.1:117-118 Ja-F '60. (MIRA 14:5)
(OTOLARYNGOLOGY)

AGZIBEKOV, Oleg Grigor'yevich; KAMENEVA, Valentina Mikhaylovna; SALTYKOVA, Viktoriya Isidorovna; TSIMMERMAN, Moisey Gernikhovich; VOSKOBOYNIK, D.I., doktor tekhn. nauk, red.; TYAGUNOVA, Z.I., red.; BRUDNO, K.F., tekhn. red.

[French-Russian nuclear dictionary] Frantsuzsko-russkii iadernyi slovar'. Pod red. D.I.Voskoboinika. Moskva, Glav. red. inostr. nauchno-tekhn. slovarei Fizmatgiza, 1961. 242 p. (MIRA 14:9)
(French language--Dictionaries--Russian)
(Nuclear physics--Dictionaries)

VOSKOBOYNIK, David Izrailevich, doktor tekhn.nauk; TSIMMERMAN, Moisey Genrikhovich; LEPESHINSKAYA, Ye.V., red.; KRYUCHKOVA, V.N., tekhn.red.

[English-Russian nuclear dictionary] Anglo-russkii iadernyi slovar'. Pod red. D.I.Voskoboinika. Moskva, Glav.red.inostr. nauchno-tekhn.slovarei Fizmatgiza, 1960. 400 p.

(Nuclear physics--Dictionaries) (MIRA 13:10)

VOSKOBOYNIK, David Izrailevich, doktor tekhn.nauk; TSIMMERMAN, Moisey Genrikhovich; LEPESHINSKAYA, Ye.V., red.; PLAKSHE, L.Yu., tekhn. red.

[Russian-English nuclear dictionary] Russko-angliiskii iadernyi slovar'. Sost.D.I.Voskoboinik i M.G.TSimmerman. Pod red. D.I. Voskoboinika. Moskva, Glav.red.inostr.nauchno-tekhn.slovarei Fizmatgiza, 1960. 334 p. (MIRA 14:1)
(Russian language--Dictionaries--English)
(Nuclear engineering--Dictionaries)

GIL'SHTEYN, P.M.; STARODINSKIY, D.Z.; TSIMMERMAN, M.Z.;
DOGANOVSKIY, M.G., kand. sel'khoz. nauk, retsenzent;
BUD'KO, V.A., inzh., red.

[Tillage machines for special purposes; their design and calculation] Pochvoobrabatyvaiushchie mashiny spetsial'nogo naznacheniia; proektirovanie i raschet. Moskva, Izd-vo "Mashinostroenie," 1964. 139 p. (MIRA 17:11)

1. Vedushchiy konstruktor Spetsial'nogo konstruktorskogo byuro zavoda sel'skokhozyaystvennogo mashinostroyeniya im. Oktyabr'skoy revolyutsii (for Gil'shteyn, Starodinskiy, TSimmerman).

TSIMMERMAN, I. KH.

PA 43/49T54

USSR/Engineering
Water - Purification
Fuel Consumption

Jan 49

"Chemical Water Purification for Low-Power Boilers Utilizing the Heat of Waste Gases," I. Kh. Tsimmerman, Engr, 2 pp

"Ze Ekonomiyu Topliva" Vol VI, No 1

Operating principle of small thermochemical water purifier. Three were installed on three boilers in a Kuybyshev factory. Use of heat of waste gases instead of steam for preheating water increased boilers' efficiency. Moreover, they will yield

43/49T54

FDB

USSR/Engineering (Contd)

Jan 49

a fuel economy of 370 tons per year, with a saving (in steam) of about 115,000 rubles.

43/49T54

FDB

STEPHENSON, Richard; SEMENOV, Yu.V. [translator]; TSIMMERMAN, M.G., [translator]; VOSKOBOYNIK, D.I., redaktor; ZHABOTINSKIY, Ye.Ye., redaktor; MURASHOVA, N.Ya., tekhnicheskiy redaktor

[Introduction to nuclear engineering. Translated from the English] Vvedenie v iadernuiu tekhniku. Perevod s angliiskogo IU.V.Semenova i M.G.TSimmermana. Pod red. D.I.Voskoboinika. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1956. 536 p. (MLRA 10:1)
(Nuclear engineering)

AGZIBEKOV, Oleg Grigor'yevich; KAMENEVA, Valentina Mikhaylovna; SALTYKOVA, Viktoriya Isidorovna; TSIMMERMAN, Moisey Genrikhovich; VOSKOBOYNIK, D.I., doktor tekhn. nauk, red.; TYAGUNOVA, Z.I., red.; PLAKSHE, L.Yu., tekhn. red.

[Russian-French nuclear dictionary]Russko-frantsuzskii iadernyi slovar'. Pod red. D.I.Voskoboinika. Moskva, Glav.red. inostr.nauchno-tekhn.slovarei Fizmatgiza, 1962. 627 p. (MIRA 15:9)

(Russian language--Dictionaries--French)
(Nuclear physics--Dictionaries)

ZIMMERMAN, M.Z.

The RN-4-35 mounted four-furrow plow. Biul.tekh.-ekon.inform. Gos.nauch.-issl.inst.nauch.i tekh.inform. no.1:64-65 '63. (MIRA 16:2)

(Plows)

FEDOROVA, I.Ya.; TSIMMERMAN, N.A.; YAROSHEVSKIY, A.Ya. (Leningrad)

Specific hematological reaction in gastric cancer with metastases to the bone marrow. Klin.med. 34 no.3:90-93 Mr '56. (MLRA 10:1)

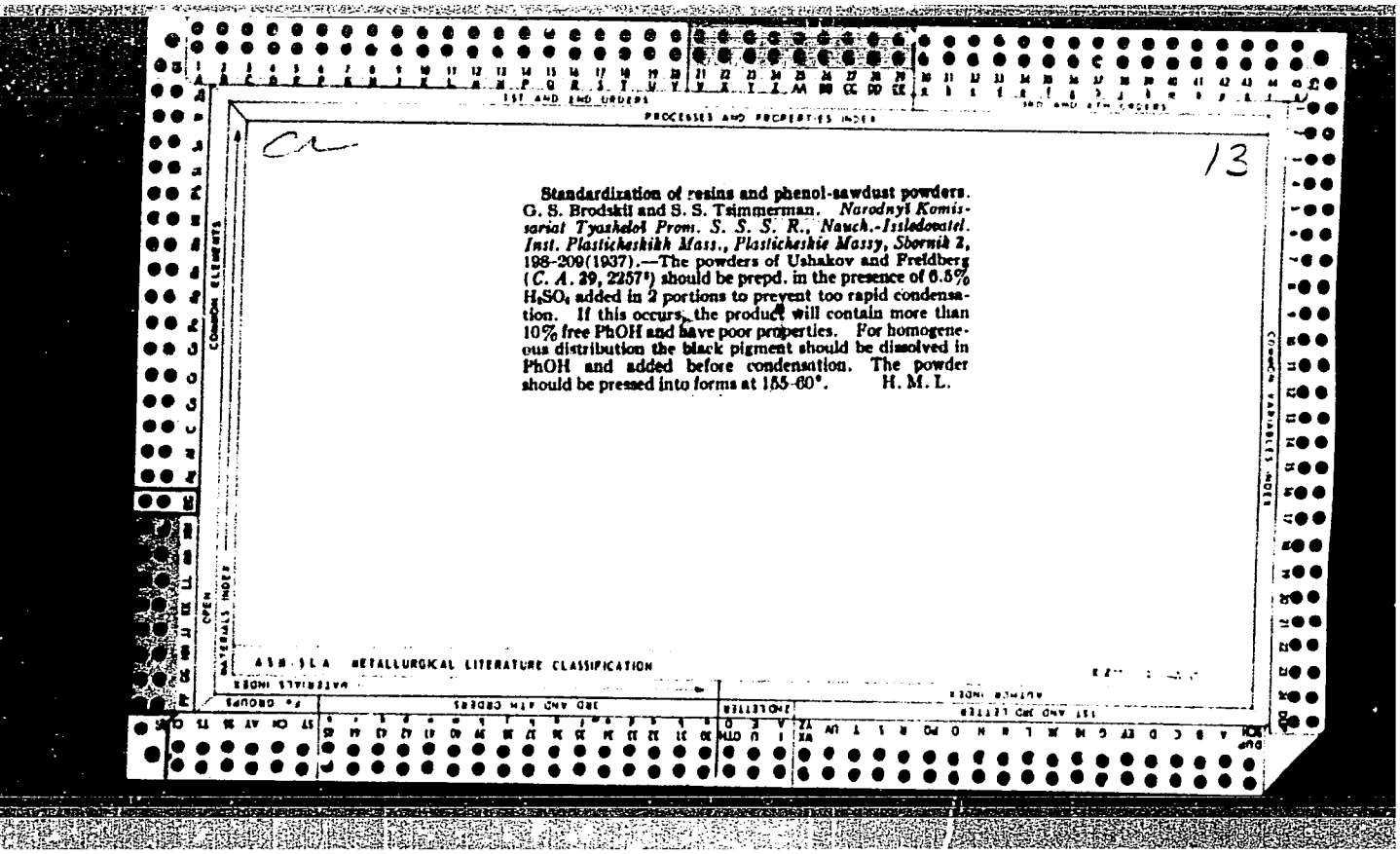
1. Iz kliniki propedevtiki vnutrennikh bolezney (dir. - deystvitel'nyy chlen AMN SSSR M.D.Tushinskiy) I Leningradskogo meditsinskogo instituta imeni akad. I.P.Pavlova.

(STOMACH, neoplasms,
metastatic to bone marrow, blood in (Rus))
(BLOOD CELLS,
count in cancer of stomach with metastases to bone marrow (Rus))
(BONE MARROW, neoplasms,
metastatic from stomach, blood count in (Rus))

TUSHINSKIY, Mikhail Dmitriyevich; YAROSHEVSKIY, Arnol'd Yakovlevich. Prinimali uchastiye: FILATOV, A.N.; AKKERMAN, V.V., doktor med.nauk; SHERMAN, S.I., prof.; TSIMMERMAN, N.A., MYASNIKOV, A.L., prof., red.; SHTUTSER, N.V., red.; SENCHILO, K.K., tekhn. red.

[Blood system diseases] Bolezni sistemy krovi. Moskva, Gos. izd-vo med.lit-ry, 1959. 386 p. (MIRA 12:9)

1. Chlen-korrespondent AMN SSSR (for Filatov). 2. Deystvitel'nyy chlen AMN SSSR (for Myasnikov).
(BLOOD--DISEASES)



13

Standardization of resins and phenol-sawdust powders. G. S. Brodskii and S. S. Tsimmerman. *Narodnyi Komissariat Tyazhelot Prom. S. S. S. R., Nauch.-Issledovatel. Inst. Plasticheskikh Mass., Plasticheskie Massy, Sbornik 2,* 198–209(1937).—The powders of Ushakov and Freidberg (*C. A.* 29, 2257⁹) should be prepd. in the presence of 0.5% H_2SO_4 added in 2 portions to prevent too rapid condensation. If this occurs, the product will contain more than 10% free PhOH and have poor properties. For homogeneous distribution the black pigment should be dissolved in PhOH and added before condensation. The powder should be pressed into forms at 155–60°. H. M. L.

TSIMMERMAN, R.R., inzh.; POKTNOV, A.A., glavnyy red.; GRECHISHKIN, I.I., zamestitel' glavnogo red.; BELIKOV, K.N., red.; POD"YEMSHCHIKOV, N.V., red.; TSITRIN, M.A., red.; STESIN, Ye.L., red.

[Calculation of mine dust removing equipment.] Raschet shakhtnykh pyleotsasyvaiushchikh ustanovok. Moskva, Gosgortekhizdat, 1963. 82 p. (Tula. Podmoskovnyi nauchno-issledovatel'skii i proektno-konstruktorskii ugol'nyi institut. Sbornik nauchnykh trudov, no.8) (MIRA 17:10)

TSIMMERMAN, S.S.,
L.I. KUZMINA, Imformatsionno -Tekh. Byull. Glavkhimplasta
1940, No. 6, 15-20.

TSIMMERMAN, V.D.; PECHALIN, L.I.; PANCHENKOV, G.M.; TIMOFEYEV, Ye.P.

"Trennung der Isotope des Titans durch Gegenstromdestillation von Titantetrachlorid"

Third Working Conference on Stable Isotopes, 28 October to 2 November 1963, Leipzig.

TSIMMERMAN, Ya.S.; CHEMODANOVA, A.M.

Study of the permeability of glandular cells of the stomach with a modified Pentzoldt-Faber iodine-potassium test. Lab. delo 10 no.3: 161-164 '64. (MIRA 17:5)

1. Kafedra propedevtiki vnutrennikh bolezney (zaveduyushchiy - prof.A.I.Levin) Permskogo meditsinskogo instituta.

TSIMMERMAN, Ya.S.

Normalizing effect of mineral water from the Novo-Izhevsk spring on the external secretion of the pancreas and bile secretion. Vop. kur., fizioter. i lech. fiz. kul't. 25 no.4:332-336 Jl-Ag '60. (MIRA 13:9)

1. Iz gospital'noy terapevticheskoy kliniki (zav. - prof. A.Ya. Gubergrits) Izhevskogo meditsinskogo instituta.
(IZHEVSK--MINERAL WATERS) (PANCREAS--SECRETIONS)
(BILE)

TSIMMERMAN, Ya.S.

Effectiveness of treating peptic ulcer by intravenous injections of sodium bromide combined with the subcutaneous injection of atropine. Trudy Izhev.gos.med.inst. 13:382-388 '51. (MIRA 13:2)

1. Iz kafedry diagnostiki i chastnoy patologii s terapiyey Izhevskogo meditsinskogo instituta. Zaveduyushchiy kafedroy - prof. A.Ya. Gubergrits.

(PEPTIC ULCER) (SODIUM BROMIDE) (ATROPINE)

TSIMMERMAN, Ya.S.; RYBOLOVLEV, Ye.V.; CHEKUNOV, V.A.; KOVALEV, A.S.

Study of gastric juice acidity without catheters by a modified desmoid test. Lab.delo 8 no.5:21-24 My '62. (MIRA 15:12)

1. Kafedra propedevtiki vnutrennikh bolezney (zav. - prof. A.I.Levin) i fakul'tetskoy terapii (zav. - prof. N.G. Khoroshavin) Permskogo meditsinskogo instituta.
(GASTRIC JUICE) (MEDICAL TESTS)

TSIMMERMAN, Ya.S., kand.med.nauk

Excretory gastric function in some diseases of the digestive system.
Vrach.delo no.12:1351 D '57. (MIRA 11:2)

1. Gospital'naya terapevticheskaya klinika (zav. - prof. A.Ya. Gubergrits) Izhevskogo meditsinskogo instituta.
(DIGESTIVE ORGANS--DISEASES) (STOMACH)

GUBERGRITS, A.Ya.; TSIMMERMAN, Ya.S.

Five years of using mineral waters of the Novo-Izhevsk springs in the treatment of some diseases of the digestive system. Vop.kur. fizioter. i lech.fiz.kul't. 22 no.6:56-59 N-D '57. (MIRA 11:2)

1. Iz propedevticheskoy terpevticheskoy kliniki (zav. - prof. A.Ya.Gubergrits) Izhevskogo meditsinskogo instituta.
(DIGESTIVE ORGANS--DISEASES) (MINERAL WATERS)

TSIMMERMAN, Ya. S., dotsent; CHEMODANOVA, A. M.

Studies on the permeability of glandular cells in the stomach (so-called gastric absorption function) as a method for functional diagnosis of stomach diseases and the evaluation of the effectiveness of therapeutic measures. Terap. 34 no.1:85-92 '62.
(MIRA 15:7)

1. Iz propedevticheskoy terapevticheskoy kliniki (zav. - prof. A. I. Levin) Permskogo meditsinskogo instituta.

(STOMACH--DISEASES)

TSIMMERMAN, Ya.S.

Temperature reactions in peptic ulcer. Klin. med. 32 no.10:87-88 O '54. (MLRA 8:1)

1. Iz propedevticheskoy terapevticheskoy kliniki (zav. prof. A.Ya. Gubergrits) Izhevskogo meditsinskogo instituta.
(PEPTIC ULCER, physiology,
body temperature in)
(BODY TEMPERATURE, in various diseases,
peptic ulcer)

GUBERGRITS, A.Ya., prof.; TSIMMERMAN, Ya.S., kand.med.nauk

Associated functional disorders of the principal digestive glands in diseases of the digestive system. Terap.arkh. 31 no.8:44-52 Ag '59. (MIRA 12:11)

1. Iz gospital'noy terpaevticheskoy kliniki (zav. - prof. A.Ya. Gubergrits) Izhevskogo meditsinskogo instituta.
(GASTROINTESTINAL DISEASES)

TSIMMERMAN, Ya.S., kand.med.nauk (Izhevsk)

Therapeutic effect of water from the Novo-Izhevsk spring in digestive diseases. Kaz.med.zhur. no.5:111 S-O '60. (MIRA 13:11)
(IZHEVSK DISTRICT--MINERAL WATERS)
(DIGESTIVE ORGANS--DISEASES)

GUBERGITS, Aleksandr Yakovlevich, zasl. deyatel' nauki prof.; TSIMMERMAN, Yakov Saulovich, dots.; REVUTSKIY, Ye.L., red.

[Therapeutic nutrition in internal diseases; a brief manual for doctors and students] Lechebnoe pitanie pri vnutrennikh boleznlakh; kratkoe posobie dlia vrachei i studentov. Kiev, Zdorov'ia, 1965. 69 p. (MIRA 18:10)

YUSFIN, L.; TSIMMERMAN, Z., starshiy nauchnyy sotrudnik

Potentials for lowering labor input on finishing operations. Na stroi. Ros. 3 no.3:10-11 Mr '62. (MIRA 16:2)

1. Glavnyy inzh. laboratorii ekonomiki stroitel'stva Nauchno-issledovatel'skogo instituta Glavnogo upravleniya po zhilishchnomu i grazhdanskomu stroitel'stvu v g. Moskve (for Yusfin).
(Plastering) (Painting, Industrial)

[illegible] -KT- YEMOV, I. P. --

"Blood Supply of the Selatic Nerve and Spinal Fluids in Humans and Animals." Dr Med Sci, Second Moscow State Medical Inst, Moscow, 1953. (KhMBiol, No 2, Sep 54)

Survey of Scientific and Technical Dissertations defended at USSR Higher Educational Institutions (12)

SO: Sum. No 481, 5 May 55

USSR / Human and Animal Morphology, Normal and Patholo- S-4
gic -- Cardiovascular System

Abs Jour: Ref Zhur-Biol., No 13, 1958, 59872

Author : Tsimmerman-Atabekova, M. F.

Inst : Second Moscow Medical Institute

Title : The Blood Supply of the Sciatic Nerve and Sacral Plexus in Man and Animals

Orig Pub: Uch. zap. 2-y Mosk. in-t, 1957, 4, 135-136

Abstract: By injecting the vessels and making preparations from 102 lower extremities of humans, two frogs, two turtles, three chickens and five dogs, it was shown that the sacral plexus is supplied in humans from branches of the internal iliac artery-- the iliolumbar, the lateral sacral, the superior

Card 1/3

Abs Jour: Ref Zhur-Biol, No 13, 1958, 59872

and inferior gluteal, the internal and pudendal, the inferior and superior vesical, the middle hemorrhoidal and the middle sacral arteries. Five zones were observed to make up the sciatic nerve. (SN) blood supply: 1) for 10 centimeters from the place where the SN comes out from under the piriform muscle, it is supplied by the superior and inferior gluteal and the internal pudendal arteries; 2) for the 10 centimeters below the gluteal fold, the SN is supplied from the second branch of the inferior gluteal artery and from the internal femoral circumflex artery; 3) for the next 5 centimeters, it is supplied by the third branch of the inferior gluteal artery and by the first perforating artery of the thigh; 4) for the next 5

Abs Jour: Ref Zhur-Biol., No 13, 1958, 59872

centimeters, by the fourth branch of the inferior gluteal artery and by the second perforating artery of the thigh; 5) from the next 8-10 centimeters, by the last branch of the inferior gluteal artery, the third perforating artery of the thigh and the popliteal artery. In the experimental animals, the blood supply of the SN is mainly provided by the large posterior branch of the femoral artery, which runs along the SN to the popliteal fossa. The SN is also supplied from the branches of the muscular perforating arteries and by the internal femoral circumflex artery. In both man and animals, the vessels, entering the SM divide, T-like, into ascending and descending branches.

SHATALOV, V.F., vet. vrach(Mariinsk, Kemerovskoy oblasti); MUROMETS, G.K., vet. vrach(Mariinsk, Kemerovskoy oblasti); TSIMOKH, P.F., vet. vrach(Mariinsk, Kemerovskoy oblasti).

Vaccinating swine following the injection of anti-erysipeloid serum. Veterinariia 35 no. 7:30-31 Jl '58. (MIRA 11:7)
(Erysipeloid)

TSIMOKH P. F. (Aspirant, Ukrainian Scientific Research Institute of Experimental Veterinary Medicine)

"Concerning the hemagglutination reaction in the infectious sinusitis of ducklings.

Veterinariya, Vol. 38, No. 12, December 1961, P. 63.

ЦЫМОХ П Ф

TSIMOKH, P.F., vet. vrach.

Disinfection of the skin in erysipelas in swine. Veterinariia 34 no.10:68 O '57. (MLRA 10:11)
(Disinfection and disinfectants) (Erysipeloid)
(Swine--Diseases and pests)

BRODSKIY, A.L.; TSIMMERINOV, Ye.I.

Extrapleural pneumonolysis in cavernous pulmonary tuberculosis.
Probl.tub. 36 no.7:106-108 '58. (MIRA 12:8)

1. Iz Ivanovskogo oblastnogo tuberkuleznogo sanatoriya No.1 (glavnyy vrach A.L.Brodskiy).
(TUBERCULOSIS) (PLEURA--SURGERY)

RUMANIA / Forestry. Forest Management. K

Abs Jour: Ref Zhur-Biol., No 7, 1958, 29536.

Author : ~~Tsimpel', H.~~
Inst : Not given.
Title : Forest Economy in the German Democratic Republic. (Lesnoye khozyaystvo Germanskoy Demokraticheskoy Respubliki).

Orig Pub: Rev. padurilor, 1957, 71, No 6, 365-369.

Abstract: The attainments of forest management in the German Democratic Republic and its prospects in the distant future are characterized.

Card 1/1

USSR/Chemistry - Methane Apr 51

"Theory of the Continuous Spectrum of Methane and Analogous Molecules," M. A. Kovner, Sh. Ye. Tsimring, State U imeni Chernyshevskiy, Saratov

"Zhur Fiz Khim" Vol XXV, No 4, pp 434-437

Calcd electronic energy levels of CH_4 mol by method of valence structures. Obtained rules of selection and calcd approx wave lengths of electronic vibrational transitions. Explained existence of continuum in ultraviolet spectrum of mol by degeneration of excited electronic levels of mol with tetrahedral symmetry. Proved Penney's calcn of C-H exchange integrals to be erroneous.

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3

Quantum mechanics of the degenerate vibrations of the methane molecule. M. A. Kovner and Sh. E. Talnring (Chernyshevskii State Univ., Saratov). *Zhur. Fiz. Khim.* 25, 438–43(1951).—A comparison between the quantum-mech. expression for the energy W of CH_4, taking into account the refinements of Linnett and Wheatley on the one hand (*C.A.* 43, 8242*f*) and the expression of Stepanov (*C.A.* 36, 3408, 6413[4]) giving W as a function of the normal coördinates and the dynamic coeffs. k_α, a, and l on the other hand, can be made conveniently only for the degenerate vibrations of the mol. From this comparison and the values given by Stepanov ($k_\alpha = 0.7165 \times 10^{-5}$ per sq. cm., $l = 0.039 \times 10^{-5}$ per sq. cm.), it is possible to calc. the value of the exchange integrals; in at. units $N_{\alpha\alpha} = -0.48$ and $N_{\alpha\beta} - N_{\beta\beta} = -3.96$. However, the value of a can also be calcd. directly from the quantum-mech. expressions; this value is 10 times that given by Stepanov. The discrepancy can be partially explained by noting that a is very sensitive to a small error in the exptl. data which served as the basis for Stepanov's calcns. The main source of error lies nevertheless in the assumption made in the present work that the exchange integrals are independent of the C—H distance. It is known that, in the case of water, an assumption of this kind is not permissible.

Michel Boudart

TSIMRING, SH. YE.

USSR/Physics - Spectra of Methane 11 May 51

"Theory of the Continuous Spectrum of Methane and Analogous Molecules," M. A. Kovner, Sh. Ye. Tsimring, Saratov State U imeni N. G. Chernyshevskiy

"Dok Ak Nauk SSSR" Vol LXXVIII, No 2, pp 235-237

Attempts to compute the electron spectrum of methane on the basis of the theory of perturbations in quantum mechanics. Thanks Prof. V. M. Chulanovskiy for recommending the theme and for his discussion. Submitted by Acad A. A. Lebedev 13 Jan 51.

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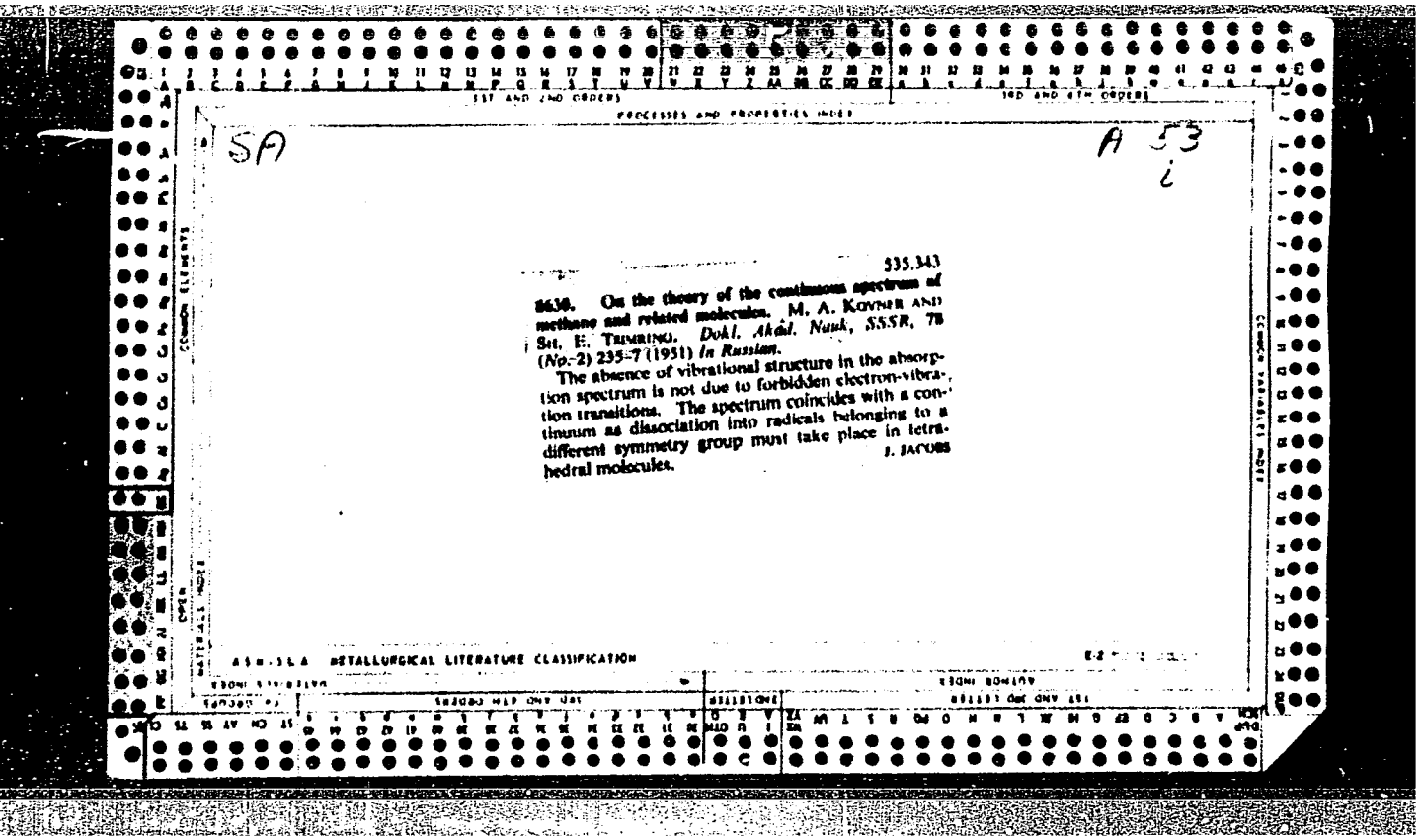

535.343

8630. On the theory of the continuous spectrum of methane and related molecules. M. A. KOVNER AND SH. E. TAUBING. *Dokl. Akad. Nauk, SSSR*, 78 (No.-2) 235-7 (1951) *In Russian.*

The absence of vibrational structure in the absorption spectrum is not due to forbidden electron-vibration transitions. The spectrum coincides with a continuum as dissociation into radicals belonging to a different symmetry group must take place in tetrahedral molecules.

J. JACOBS

TSIMRING, SH. E.

S.A.

Sect. A

Molecules

2891. Quantum mechanics and force-constants of the methane molecule and of deuteromethanes. M. A. KOVNER AND SH. E. TSIMRING. *Dokl. Akad. Nauk SSSR*, 79, 949–52 (*No.* 6, 1951) *In Russian.* 539.132

For the C electrons forming the C–H bond, orthonormal linear combinations of 2*s* and 2*p* atomic functions are constructed which are energetically most favourable. For these wave functions the deviation of their axis of symmetry from the C–H tetrahedral direction is characterized by 2 "coeffs. of deviation." All 5 force constants and their dependence on Coulomb and exchange integrals are established using symmetry co-ordinates. One coeff. of deviation, being constant for all deuterated methanes, may be used as index of deformation of the electron shells. J. JACOBS

Saratov State U. im N. G. Chernyshevskiy

GRIGOR'YEV, M.A.; KATS, L.I.; TSIMRING, Sh.Ye.

Measurement of the standing wave ratio in the microwave band by means of a directional coupler and a phase shifter. Izv. vys. ucheb.; radiotekh. 5 no.1:47-50 Ja-F '62. (MIRA 15:5)
(Microwave measurements)
(Wave guides)

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AUTHORS: Grigor'yev, M.A., Kats, L.I. and Tsimring, Sh.Ye.

TITLE: Measurement of the standing-wave ratio by means of a directional coupler and a phase-shifter at millimetre waves

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, v. 5, no. 1, 1962, 47 - 50

TEXT: A simple method of measurement of the standing-wave ratio (SWR) by means of a directional coupler in conjunction with a phase-shifter is described. The measurement system is illustrated in Fig. 1. This consists of: K - klystron oscillator; A - attenuator; ИЛ - measuring line; НО - directional coupler; Ф - phase-shifter; ПА - variable attenuator; П - plunger and УИ - an amplifier with an indicator.
It is assumed that reflections from the generator and detector can be neglected and that the phase-shifter has a constant attenuation (independent of the phase change) and does not

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Measurement of ....

introduce any reflections. The problem consists of finding an expression for the modulus of the reflection coefficient on the basis of the readings of the galvanometer, which is connected through a square-detector at the output of the directional coupler. It is shown that the modulus of the reflection coefficient of the load is expressed by:

$$|\Gamma| = \frac{|E_2|}{|E_1|} = |\Gamma_{k3}| \frac{(\sqrt{\alpha_1} \pm \sqrt{\alpha_2})}{(\sqrt{\alpha_1^{(0)}} + \sqrt{\alpha_2^{(0)}})} . \qquad (7)$$

where α_1 and α_2 are the maximum and minimum readings of the galvanometer when the load is connected, while $\alpha_1^{(0)}$ and $\alpha_2^{(0)}$ are the maximum and minimum galvanometer readings when the load is shorted; Γ_{k3} is the modulus of the reflection coefficien in the plane of the load when the latter is short-circuited. The standing-wave ratio is therefore expressed by:

Card 2/4

$$KCB = \frac{1+|\Gamma|}{1-|\Gamma|} = \frac{\sqrt{\alpha_1^{(0)}} + \sqrt{\alpha_2^{(0)}} + (\sqrt{\alpha_1} \pm \sqrt{\alpha_2})|\Gamma_{k3}|}{\sqrt{\alpha_1^{(0)}} + \sqrt{\alpha_2^{(0)}} - (\sqrt{\alpha_1} \pm \sqrt{\alpha_2})|\Gamma_{k3}|} . \qquad (8).$$

It is seen from Eqs. (7) and (8) that the SWR when measured by the above method is independent of the attenuation of the waveguide section which connects the measured load. This is the main advantage of the method in comparison with the method based on a measuring line. The method was compared experimentally with the measuring-line method and it was found that the results were in good agreement. However, the possibilities of the method have not been fully investigated due to the fact that its errors have not been analyzed in detail. There are 2 figures.

ASSOCIATION: Kafedra obshchey fiziki Saratovskogo gos. universiteta im. N.G. Chernyshevskogo (Department of General Physics of Saratov State University im. N.G. Chernyshevskiy)

SUBMITTED: April 21, 1961

TSIMRING, Sh. Ye., Cand of Phys- Math- Sci -- (diss) "Variational Method in Calculating Periodic Waveguides," Saratov, 1959, 10 pp (Ministry of Higher and Secondary Special Education, RSFSR. Saratov State University im N. G. Chenyshevskiy) (KL, 7-60, 107)

AUTHORS: Golubkov, P.V. and Tsimring, Sh. Ye. SOV/109-3-3-22/23

TITLE: The Second All-Union Conference on Radioelectronics of the Ministry of Higher Education of the USSR (Vtoraya vsesoyuznaya konferentsiya MVO SSSR po radioelektronike) - News Item

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 3, pp 440 - 444 (USSR)

ABSTRACT: The conference took place during September 23 - 29, 1957, at Saratovskiy gosudarstvennyy universitet imeni N.G. Chernyshevskogo (Saratov State University imeni N.G. Chernyshevskiy). Apart from the universities, the conference was attended by the representatives of some scientific research institutes of the Soviet and Ukrainian Academies of Science, various industrial establishments and the interested ministries. This arrangement stimulated the discussion and evaluation of the papers presented and permitted the determination of plans for the future research to be carried out by the universities in the field of radioelectronics.
In view of a large number of papers and communications (over 150), the majority of these were read in various sections (electrodynamics, electronics, radiowave

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propagation, radio-astronomy and radiospectroscopy, semiconductors and their application in radio equipment). During the plenary session on September 23, two papers were read: "Development Trends of UHF Electronics in the Soviet Union" by N.D. Devyatkov and "Electromagnetic Waves in the System of Vari-directional Electron Beams" by V.M. Lopukhin. N.D. Devyatkov presented numerous factual data illustrating the rapid development of the U.H.F. electronics in the Soviet Union and the vast contribution of the Soviet scientists to the theoretical foundations of this science; he also discussed the development trends of U.H.F. electronics in the immediate future. The paper described a number of original Soviet U.H.F. devices. The work of V.M. Lopukhin was concerned with the theoretical investigation of the phenomena taking place in multi-ray devices whose electron beams have different directions. The author showed that the presence of the electron beams which are perpendicular to the axis x facilitates the appearance of the solutions which are increasing functions of x for the case of n rays directed along the axis x; it also leads to the

appearance of exponentially increasing solutions in the presence of one beam in the above direction. The Electronics Section comprised 50 papers; more than one-third of these were concerned with the theoretical and experimental investigation of wide-band electronic devices for U.H.F. The lecture by V.N. Shevchik, L.Ya. Mayofis and L.D.Pokrovskiy dealt with the extension of the known theories of travelling-wave tubes and backward-wave tubes to the practically important cases when the delay structure necessitated the taking into account of the discrete character of the interaction of the electron beam with the high-frequency field. The lecture by V.C. Stal'makhov, V.N. Shevchik and Yu.D. Zharkov was devoted to the simplified analysis of the operation of a backward-wave tube by employing the cosinusoidal approximation of the given field. The papers by V.B. Braginskiy, A.S. Gorshkov, A.I. Kostiyenko, G.P. Lyubimov, I.T. Trofimenko and V.V. Anisimov were concerned with the detailed experimental and theoretical investigation of the possibility (first indicated by V.N. Shevchik in 1954) of expanding the bandwidth of the electronic trimming of reflex klystrons by means of the

mutual synchronisation of several klystron tubes. The operation of reflex klystrons with multi-circuit resonant systems was also investigated. The results of experimental and theoretical investigation of two-ray amplifying and multiplying tubes were given in the communication by L.Z. Aitova, V.M. Lopukhin, L.A. Shkudova and in the communication of V.I. Kanavets. Some of the papers in the Electronics Section dealt with the investigations which were concerned with the development of novel U.H.F. devices, suitable for the generation and amplification of the wave-forms in the millimetre and sub-millimetre ranges. The papers of great interest were: "Experimental Investigations of the Radiation of the Electron Bunches in the Vicinity of Non-homogeneities" by V.B. Braginskiy and Ye.P. Mustel', "Comparison of the Efficiency of Certain Methods of the Generation of Millimetre Waves" by A.S. Tager and "Application of the Higher Spatial Harmonics of the Electro-magnetic Field in Slowing-down Systems" by A.S. Tager and V.A. Solntsev. The problems dealing with various fluctuation phenomena in electron and gas-discharge devices and with the physics and applications of gas discharges at

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U.H.F. were discussed in the papers by S.A.Akhmanov, I.T. Trofimenko, G.F. Antonov and N.G. Tikhomirova, who investigated the phenomena in certain oscillatory U.H.F. systems; the problem was also discussed in the papers: "The Electron Velocity Distribution in a Disintegrating Plasma" by A.M. Aleskovskiy; "Frequency and Amplitude Fluctuations of the Oscillations of a 3-cm Klystron Oscillator" by V.N. Nikonov; "De-electronisation of Gas in a 10-cm Antenna Switch" by U.V. Gorokhov and "Detuning of Cavity Resonators by Means of Gas Discharges" by U.V. Gorokhov and I.T. Byzova. The lecture of S.A. Kornilov entitled "Reflex Klystron as a Regenerative U.H.F. Amplifier" was of great practical interest. The simplicity of the amplifier permits the application of this device in the whole range of equipment where the comparatively high level of noise is not important. The Section of Electrodynamics had six sessions, during which over 30 papers and communications were read. A considerable part of these was devoted to the theoretical and experimental investigations of the propagation of electromagnetic waves in various delay systems. The

paper by V.M. Dashenkov entitled "Scattering Properties of Certain Rod-type Delay Systems" gave the scattering equation for a structure consisting of a number of arbitrarily-loaded rods (stubs). The equation was employed to analyse single-stage stub systems and the author found that the theory was in agreement with the experimental results. The communication by V.I. Bespalov and E.Ya. Daume entitled "Propagation of Electromagnetic Waves in a Non-uniform Helix" gave the results of a perturbation-method investigation of the effect of random longitudinal and radial displacements of the helix conductor on the characteristic of the delay system. The results obtained by the authors permit the evaluation of the tolerances in the helices employed in backward-wave tubes. The paper "Generalisation of the Circuit Theory Including the Helical Delay Systems" was concerned with the possibility of the application of small perturbing objects to the measurement of the coupling impedance in a wide range of delay systems. Apart from the theoretical justification of the above method of measuring the coupling impedance, the paper gave some experimental results.

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A.I. Shtyrov proposed (and proved by means of the reciprocity theorem) an interference method of the "cold" investigation of delay systems. The method permits the measurement of electrical non-homogeneities of delay systems, gives a high accuracy and requires comparatively little effort. The paper "Production of Periodic Structures by Means of Ultrasonics" by Ye.M. Gershenzon was devoted to the experimental investigations of an interesting modification of a periodic structure, i.e. a regular waveguide filled with a liquid in which an ultrasonic standing wave was excited. V.P. Sazonov described the results of an investigation of the distribution of electric fields in a number of important delay systems (combs, stub systems, etc.) by means of two methods (probes with a high-resistance input) and small perturbing objects). The author also obtained the distributions of tangential components of the electric fields along certain boundary surfaces, which are of considerable interest. In a number of cases, the author also measured the coupling impedance. Some of the lectures were devoted to the problems of diffraction

which are important in the analysis of the directional

patterns of antennae. Here one should mention the papers by Ye.N. Vasil'yev and S.M. Verevkin, dealing with the excitation of the solids of revolution. The analysis of the oscillations in π-type and toroidal volume resonators and in π-type and cross-shaped waveguides was given in the papers by V.L. Patrushev and V.M. Sedykh, respectively. A number of the papers in the Electrodynamics Section dealt with the complex phenomena appearing at the junctions of waveguides. Here, it is necessary to mention the papers: "The Calculation of Junctions" by Ya.M. Turover; "The Problem of Construction of Certain Wideband Matching Devices" by Ye.V. Anisimov and V.D. Luchinin and "Measurement of the Parameters of the Energy Outputs in U.H.F. Devices by Means of a Symmetrical Transformer" by I.A. Dukhovnikova and M.M. Rayner. The behaviour of various substances in electromagnetic fields at U.H.F. was discussed in the papers of O.V. Karpova, U.P. Radin, I.A. Shekhtman, A.I. Pilshchikov, A.L. Levinson, N.S. Sedletskaya and A.A. Kuznetsov. In the Radio-spectroscopy and Radio-astronomy Section, the most important papers were delivered by N.G. Basov, I.D. Murin, A.P.Petrov,

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A.M. Prokhorov, I.V. Shtranikh, K.K.Svidzinskiy, A.N. Orayevskiy, U.L.Klimontovich, R.V. Khokhlov, G.H. Vasneva, V.V. Grigor'yants, M.Ye. Zhabotinskiy, D.N. Klyshko, V.L. Sverdlov, Ye.I. Sverchlov, and V.V. Nikitin which dealt with the results of the theoretical and experimental investigations of various types of molecular oscillators (masers). The paper of N.G. Basov and his collaborators described the principle of operation of a molecular clock having an accuracy of 10^{-9}. The results of a theoretical investigation of the molecular radiation in high-frequency fields were given in the papers of V.M. Fayn, entitled "Radiation of the Molecules in Strong High-frequency Fields" and "The Spontaneous Radiation of Molecules at Ultra-high Frequencies". In the second of the above papers, the author came to the conclusion that the width of the spectral line of the spontaneous radiation at U.H.F. is finite. The author also proposed a classical analogy for the phenomenon of coherence in the spontaneous radiation. I.A. Deryugin investigated in his paper the revolution of the plane of

polarisation and the ferromagnetic resonance in colloidal iron, nickel, cobalt and permalloy. The experiments were carried out over a wide band of frequencies and showed a strong dependence of the above effects on the losses in the samples. The works of A.M. Prokhorov, V.N. Zverev and L.S. Korniyenko were devoted to the investigation of the fine and ultra-fine structure of the spectrum of the electron paramagnetic resonance of the ions of chromium and iron in the lattice of aluminium oxide. The radio-spectroscope, constructed by the first two authors, made it possible to reveal the signal from a sample containing 3×10^{-11} mol of the paramagnetic ions of Cr^{3+}. The paper by V.V. Zheleznyakov, in which the author suggested a hypothesis concerning the origin of the sporadic radiation of Jupiter, aroused a considerable interest and lively discussion. According to the hypothesis, the bursts of the radiation from Jupiter are due to the plasma oscillations in its ionosphere. The author found a close correspondence between the parameters of the ionosphere of Jupiter and those of the layer F_2 of the Earth ionosphere.

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The paper contained also a hypothesis dealing with the analogous mechanism of the recently discovered sporadic radiation of Venus. The work of G.G. Getmantsev entitled: "The Theory of Magnetic Braking Mechanism of the Non-thermal Cosmic radiowave Radiation" eliminates the theoretical difficulties which are encountered when an attempt is made to consider the galactic plane as being the source of cosmic electrons. The author considered that the electrons are formed as a result of non-elastic collisions between the relativistic protons of the atoms of the stellar medium. I.G. Moiseyev described a 10-cm radio telescope, having a mobile (vibrating) directional pattern. The movement of the pattern is secured by periodically switching the input of the receiver from one antenna radiator to another, the radiators being situated in the vicinity of the focus of a parabolic reflector. G.G. Getmantsev described a simple modulator (switch) which was constructed for the above equipment at the Gor'kiy University by N.N. Kholodilov and A.V. Zakharov. The Radiowave Propagation Section had nine papers and communications. The paper by B.N.Gersham

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entitled "The Theory of Large-scale Non-uniformities" proposed a theory analogous to that of the cellular Martin waves, which also took into account the effect of the magnetic field of the Earth. N.G. Denisov gave a theoretical analysis of the propagation of radiowaves through that region of the non-uniform magnetically-active plasma in which a partial absorption of the electromagnetic waves takes place due to the vicinity of the frequency of the external field and the natural frequency of the plasma. The author calculated the reflection coefficients and the propagation and absorption coefficients of the extraordinary wave for the transverse propagation and investigated the absorption of the ordinary and the extraordinary waves for the quasi-longitudinal propagation. The influence of the solar activity on the ionosphere was investigated in the papers by N.N.Yeryushev and N.A. Savich. As a result of the systematic measurement of the overall intensity of atmospherics at frequencies from 13-42 kc/s the various properties of the radiowaves were studied. Some conclusions relating to the influence of the chromospheric

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explosions on the sun on the ionosphere were also arrived at. The paper by A.A. Semenov and G.A. Karneyev entitled: "The Problems of the Statistical Evaluation of the Results of Measurements in the Investigation of the Rapid Fluctuations of Ultra-shortwave Radio Signals" aroused considerable interest; similarly, the paper by A.A. Semenov and Ch.Ts. Tsydypov under the title "Investigation of the Variations of the Direct Radio Signal Propagation in the Non-uniform Troposphere over a Ground Path" was of considerable interest. The latter paper gave some results of an experimental investigation of the fading of the direct ray over a medium-distance ground path. The statistical characteristics of the amplitude fluctuation of the signal were investigated and an attempt was made to clarify the mechanism of the signal variations. During the ensuring discussion, the great practical value of the above works was emphasised and it was suggested that the work should be extended in order to attain a greater accuracy. Twelve papers and communications were read at the Semi-conductor Section. L.C. Berman gave an approximate method of calculating the transients in a transistor operating with

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large signals. The method was based on a quasi-linear approximation and the transient was regarded as a switch-over from a conducting state (with constant equivalent parameters of the circuit) to a non-conducting state with zero-value parameters. The switch-over point was taken as the instant when the charge and the voltage on the base-emitter capacitance is zero. The author showed that the method is in good agreement with the experiment.
"The Detector Crystals of Pressed Germanium" by Z.I. Kir'yashkina, described the technology of the preparation of germanium wafers for press-method diodes, whose main advantage is an almost complete absence of the loss of germanium. The results of an investigation of samples of p-n junction diodes showed that the method was promising for industrial applications. The influence of adsorption and illumination on the change of the contact potentials in the films of selenium and tellurium was investigated in the work of V.F. Bogolyubov, U.F. Lushkin and I.A. Nakrap. A paper of V.V.Pasynkov and Ya.I.Panova described the experiments on the development of semi-conductor loads for waveguides. The basic material was

made of ultra-china clay (binder) and of grains of silicone carbide (the absorbing component). The investigation showed that the samples produced had satisfactory characteristics. The development of non-linear semiconductor resistances was described in a paper of V.V. Pasynkov and L.K. Chirkin; resistance elements for powers of 10-15W were produced and their applications were studied. A method of calculating an inverse peak current in p-n diodes was given in the paper of L.I. Baranov and M.C. Bekbulatov. The formulae obtained made it possible to explain various forms of the peaks observed in the experiments. The paper by Yu.N. Az'yan, G.N. Berestovskiy, L.N. Kaptsov, V.V. Migulin, K.S. Rzhevkin, K.Ya. Senatorov and T.N. Yastrebtseva contained a survey of the works dealing with the applications of transistors in various radio circuits. The transient processes in the base of the transistors were thoroughly investigated. The delay between the input and the output signals in a transistor was thought to provide the possibility of designing an oscillator without

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reactive elements and such oscillators were actually constructed. Some important engineering methods of designing various transistor circuits were developed. G.N. Berestovskiy read a paper in which he gave the analysis of the operation of a transistor AC-DC converter. The experimental data corroborated the accuracy of the formulae proposed by the author and showed that a high conversion efficiency could be obtained with a number of Soviet transistors. During the conference, a number of trips were arranged to various industrial establishments of the town of Saratov. During the closing plenary session of the conference, on September 28, a unanimous resolution summarising the work of the conference and containing recommendations with regard to the subject matter and the plans for the future work was adopted. It was also decided that the third All-Union conference of the Ministry of Higher Education of the USSR on radioelectrons would be held in Khar'kov in September, 1959.

SUBMITTED: December 7, 1957

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AUTHOR: Tsimring, Sh. Ye. 109-2-1-1/17

TITLE: A Variational Method for Designing the Waveguides Having Periodic Inhomogeneities - Part I (Variatsionnyy metod rascheta volnovodov s periodicheskimi neodnorodnostyami - Chast' I)

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol 2, Nr 1, pp 3-14 (USSR)

ABSTRACT: Propagation of electromagnetic waves in a periodically corrugated waveguide with ideal-conductor walls and with loss-free inside medium is examined. It is pointed out that the square of the wave number of propagating wave can be determined as a stationary value of the functional (12). It is found that, for the variational problem involved, boundary conditions are natural. In other words, permissible functions that minimize the functional (12) should not necessarily satisfy the boundary conditions.

Theoretical investigations of propagation in periodic waveguides use three fundamental methods: the perturbance method, the joining method, and the variational method. The first method is rarely used in practice. The joining method is often successfully used when the number of inhomogeneities per one wavelength is great. In the case of spatial-harmonic TW tubes, however, the inhomogeneity length is comparable to the wavelength. It is very difficult to apply the joining method in such cases. The variational method is applicable to delay systems. It permits evaluating the absolute value of error in determination of fields and phase velocity. The last two methods are applicable only in those cases

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A Variational Method for Designing the Waveguides (Cont.) 109-2-1-1/17

when a waveguide cell can be subdivided into a number of ranges for which Maxwell's equations, satisfying the boundary conditions at the waveguide walls, are known. If the corrugation shape does not satisfy the above condition, both methods become inapplicable. Yet, such waveguides may conceivably be used for correction of dispersion characteristics or for optimum field distribution in an interaction space. An attempt is made in the article to apply the well-known Ritz variational method to the calculation of fields in and dispersion characteristics of a corrugated waveguide. The vector equation for a field rot rot $\vec{H} = k^2\vec{H}$ (where $\vec{H}$ is field vector, k is wave number) is based on the classic Maxwell's equations. Starting from it and using a number of integral transformations and also the Ostrogradsky-Gauss theorem, the author proves that the rot rot operator is self-adjoint and that the boundary conditions are natural. In principle, the variational method permits determining the dispersion characteristics and field pattern of a periodically corrugated waveguide of any shape, and also determining of natural frequencies of cavities and critical wavelengths of regular waveguides. On the other hand, the method is inapplicable for description of the field pattern in rejection band when the walls and the internal medium of the guide are not ideal or when a periodic guide contains an electron beam. The variational method is illustrated by an example: an approximate calculation of a dispersion equation for two parallel planes, one of which has rectangular goffers of arbitrary size.

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The following conclusions are offered:
The dispersion relation - propagating-wave phase-velocity / frequency can be determined by means of Ritz' variational method. The square of the wave number of a wave propagating in a corrugated waveguide having calls of any shape can be determined as a minimum of the definite functional (12) spread over the range of one cell and having natural boundary conditions. A similar variational method can be used for determination of fields and natural frequencies of any resonators because the boundary conditions are natural also in cases of variation of magnetic field intensity. The same method can be used for determination of field patterns and critical wavelengths of a regular waveguide of any cross-section (this is a particular case of the corrugated waveguide). The basic disadvantage of the method lies in the fundamental difficulty of allowing for an electron beam or for finite conductance of the guide walls and internal medium.
A dispersion equation for a delay system comprising two parallel sheets with rectangular goffers is a higher-order approximation as compared to Kleen's and Ruppel's Ref 7 dispersion equations. Acknowledgements go to Professor P.V. Golubkov for the suggestion of the theme and the supervision of the project and to Docent A.S. Shekhter for "interesting discussions". There are 2 figures, and 14 references, 6 of which are Soviet, 1 German, 7 English.

SUBMITTED: January 23, 1956
AVAILABLE: Library of Congress
Card 3/3 1. Waveguides--Design 2. Waveguides--Theoretical analysis 3. Waveguides --Propagation

GOLUBKOV, P.V., prof.; TSIMRING, Sh.Ye., assistent.

Second All-Union Conference of the Ministry of Higher Education of the U.S.S.R. on Radio and Electronics. Izv. vys. ucheb. zav.; radiotekh. no.1:123-128 Ja-F '58. (MIRA 11:4)
(Radio—Congresses) (Electronics—Congresses)

TSIMRING, Sh. Ye.

GOLUBKOV, P.V.; TSIMRING, Sh.Ye.

Second all-Union conference on radio electronics of the Ministry for Higher Education. Radiotekh. i elektron. 3 no.3:440-444 Mr '58. (MIRA 11:4)
(Electronics--Congresses)
(Radio--Congresses)

TSIMRING, Sh. Ye.

MICROWAVES

"Variational Method of Design of Waveguides with Periodic Irregulatities Part II", by Sh. Ye. Tsimring, Radiotekhnika i Elektronika, No 8, August 1957, pp 969-988.

The variational method, developed in the first part of this article (Radiotekhnika i Elektronika, January 1957, Page 3) is extended to include the case when the geometry of the periodic waveguide (resonant cavity) admits of the use of the partial-region method. A theory is derived for the determination of a pair of dispersion curves (and of natural frequencies respectively), located on both sides of the true dispersion curve, a fact of great importance in the estimate of the accuracy of the results.

As an example, the procedure developed was used to obtain the dispersion equation for a decelerating rectangular corrugations of finite thickness, and various dispersion curves are calculated for several values of dimensions of this system. Reference is made to work by Chu and Hansen, Journal of Applied Physics, 1949, Volume 20, Page 280 and to J.R. Pierce's "Traveling Wave Tubes."

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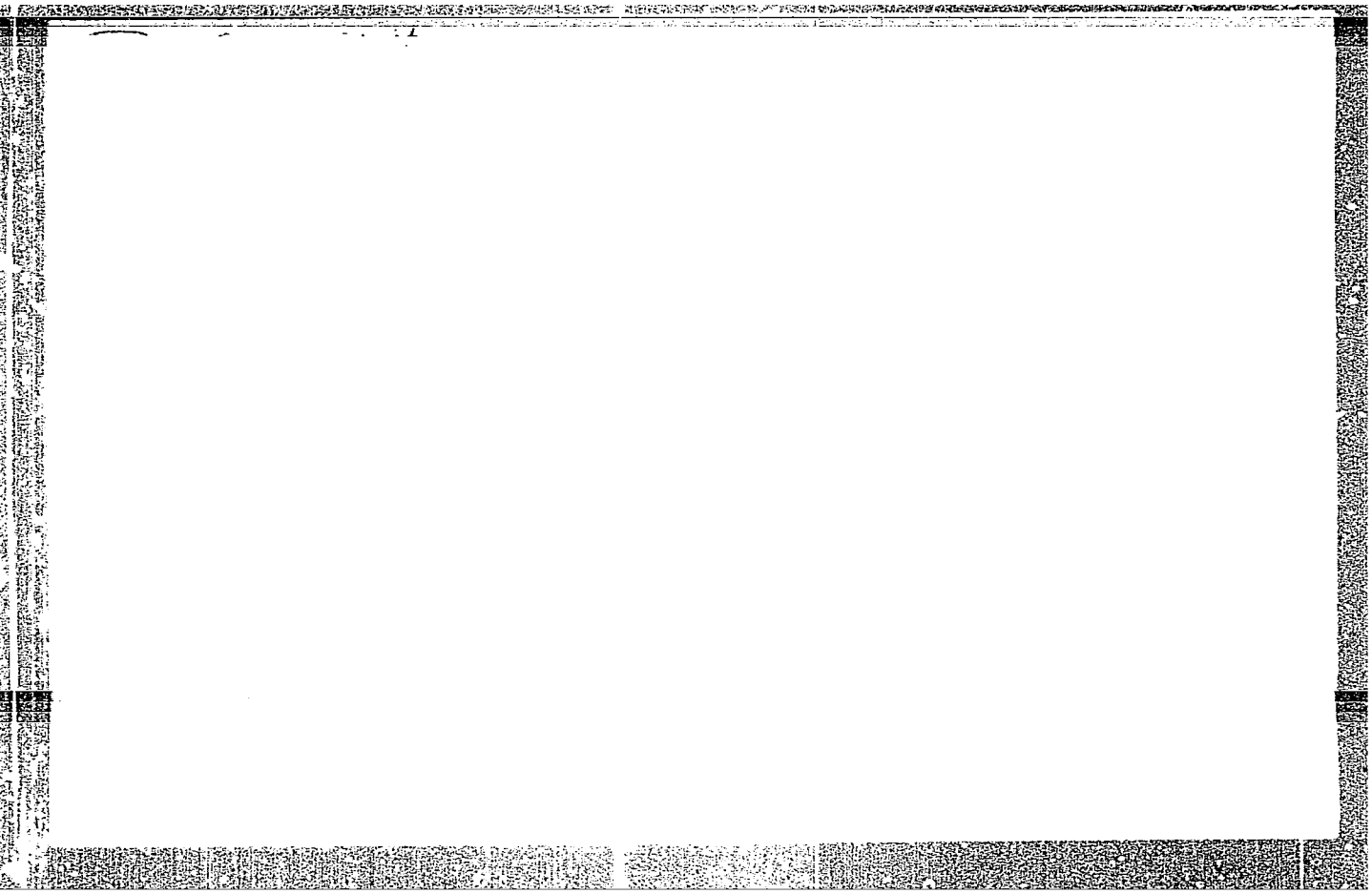

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001757110005-4"

Tsimring, Sh. Ye.

AUTHOR: Tsimring, Sh.Ye. 109-8-4/17

TITLE: Variational Method of Calculating the Wave-guides with Periodic Discontinuities. Part II. (Variatsionnyy metod rascheta volnovodov s periodicheskimi neodnorodnostyami, ch. II.)

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol.II, No.8, pp. 969-988 (USSR)

ABSTRACT: The variational method as applied to the solution of electro-magnetic problems was given by the author in an earlier work [Ref.1]. This was expressed by equations (1) and (2), where Ω is the volume of 1 cell of a periodic wave-guide and vectors $\vec{H}$ and $\vec{E}$ should satisfy a relationship of the Floquet type following from the periodicity of the wave-guide, as given by equation (3). It is also shown (the derivation is given in the appendix, p. 985) that the variational method can be given in terms of an alternative rule, from which it follows that, if for a given tangential component of the magnetic field H_t over a surface S (where the meaning of S and other symbols referred to later can be seen from Fig.1):

$$k^2 = \min J_1 \qquad (10)$$

then for a given tangential electric field:

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Variational Method of Calculating the Wave-guides with Periodic Discontinuities. Part II.

$$k^2 = \max J_2. \qquad (11)$$

Conversely, if, at a given H_t ;

$$k^2 = \max J_1 , \qquad (12)$$

then, at a given E_t ;

$$k^2 = \min J_2 . \qquad (13)$$

The above formulae can be used in evaluation of the propagation parameters of the periodic wave-guide shown in Fig.1. The magnetic and electric fields of the system can be expressed by equations (31) for the region I (see Fig.1) and by equations (32) for the region II. If it is then assumed that the tangential component of the electric field E_t is known and that E_t over the segment mq is expressed by:

Variational Method of Calculating the Wave-guides with Periodic Discontinuities. Part II.

$$E_t = \begin{cases} a_1 + a_2 z + a_3 z^2 & |z| \leq c \\ 0 & c \leq |z| \leq d \end{cases}. \qquad (33)$$

The solution of the dispersion equation is given by equations (39) and (40). If it is assumed that H_t is given, then the solution is that shown in equations (47), (48) and (49). The above formulae can be used in calculations especially for the case of $\gamma = \infty$, i.e. the so-called open hairpin wave-guide. The resulting dispersion curves are shown in the following coordinates. The delay coefficient η versus $\frac{h}{\lambda_o}$ where λ_o is the wavelength for free space and η is equal to $\frac{v_\psi}{v_o}$ where v_ψ is the phase velocity of the zero harmonic and v_o is the velocity of light. The resulting, calculated curves are shown in Figs. 2, 3, 4, 5 and 6. These are plotted for various

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parameters ρ which is defined by :

$$\rho = \frac{h'}{L} = \frac{kh}{kL} = \frac{1}{\pi} \frac{kh}{\xi}$$

(see Fig.1). The author expresses his deep gratitude to the Doctor of Physical and Mathematical Sciences Prof. Glubkov, for directing this work and expresses his appreciation to the Doctor of Physical and Mathematical Sciences L.A. Vaynshteyn, for his interest in this work, his valuable advice and for supplying some of the material pertaining to this work. [Ref.4].
There are 9 references, of which 4 are Slavic, and 6 figures.

SUBMITTED: October 8, 1956.

AVAILABLE: Library of Congress.

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ZATULOVSKIY, S. [Zatulovs'kyi, S.], inzh.; TSIN, M. [TSyn, M.], inzh.

Pipes of the high-strength cast iron. Nauka i zhyttia 13 no.10:22-23 N '63. (MIRA 16:12)

L 1391-66 EPA(s)-2/EWT(m)/EPF(n)-2/EWP(t)/EWP(b) IJP(c) JD/WW/JG

ACCESSION NR: AP5016662

UR/0382/65/000/002/0139/0144
669.16 : 538.4

AUTHOR: Aronova, N. R.; Polishchuk, V. P.; Tsin, M. R.

48
B

TITLE: Electromagnetic mixing of liquid metals by pulsed fields

SOURCE: Magnitnaya gidrodinamika, no. 2, 1965, 139-144

TOPIC TAGS: liquid metal, electromagnetic mixing, MHD flow

ABSTRACT: The Institute of Foundry Problems AN UkrSSR has reviewed the methods of liquid metal mixing and has concentrated its effort on the study of utilization of electromagnetic forces for this purpose. Simpler variants of these devices have been studied extensively and the conclusions are reported. Turbulent mixing is achieved by use of E- and O-type electromagnets. The electromagnetic forces lead to very strong mixing especially when the metal trough is not completely filled. Transparent channels were used to observe the behavior of a test metal (mercury) in the mixing chamber. The efficiency of energy transfer reaches about 90% and does not depend strongly on the wall thickness, thus making this method suitable for high temperature operation. Experiments with single phase mixers did not

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ACCESSION NR: AP5016662

permit any wide variation of parameters. A new magnetodynamic device has been constructed and studied to mix mercury and water or powder-like substances. Various mixing regimes were observed by changing relative phases between the mixer magnets. The main advantages of the new system, which is suitable for admixing any material, are the small electric losses. Heat losses during the flow through the mixer are compensated and some additional heating may occur due to currents flowing in the mixed metals. Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 07Jan65 ENCL: 00 SUB CODE: MM, ME

NO REF SOV: 002 OTHER: 000

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E194/E435

11.3900
AUTHORS: Polishchuk, V.P., Tsin, M.R.

TITLE: Electromagnetic pumping of non-metallic melts

PERIODICAL: Tsvetnyye metally, no.10, 1962, 82-83

TEXT: For pumping molten salts, which are used in non-ferrous metallurgy, mechanical pumps cannot be used due to the high temperatures involved; electromagnetic pumps cannot be used because the molten salts have inadequate electrical conductivity; airlift pumps are used but are unsatisfactory. The Institut liteynogo proizvodstva AN UkrSSR (Institute of Foundry Production UkrSSR) has developed a pump for this purpose in which molten metal driven by an electromagnetic pump acts as a piston to drive the molten salts. With the pump inactive the molten metal fills the bottom of the salt bath and the base of the annular pump nearly to the level of the molten salt inlet port. When the pump is switched on the rising metal first cuts off the salt inlet port and then drives the molten salt in the pump body upwards. Double acting pumps can be used having two pump bodies connected to a common reservoir of molten metal so that one body is pumping whilst the

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other is refilling. The metal used must have suitable melting and boiling points, it must be about twice as dense as the salt and of good conductivity, it must not react with the salt. Copper, tin, lead and other metals are suitable for different salts. There is 1 figure.

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POLISHCHUK, V.P.; TSIN, M.R.

New trends in the utilization of applied magnetohydrodynamics in industry. Mashinostroenie no.6:109-110 N-D '62.
(MIRA 16:2)
(Magnetohydrodynamics)

TSIN, M.R., inzh.; ZATULOVSKIY, S.S., inzh.; DIDYK, B.S., inzh.; KOZENKO, A.V., inzh.; SHIYAN, V.G., inzh.; SEMENOV, L.S., inzh.

Casting pressure pipe of cast iron with spheroidal graphite. Met.i gornorud.prom. no.5:37-41 S-O '62. (MIRA 16:1)

1. Institut liteynogo proizvodstva AN UkrSSR (for TSin, Zatulovskiy, Didyk, Kozenko). 2. Ukrainskiy nauchno-issledovatel'skiy trubnyy institut (for Shiyan, Semenov).
(Pipe, Cast iron)

DIDYK, B.S.; KOZENKO, A.V.; TSIN, M.R.; ZATULOVSKIY, S.S.; KOLESOVA, V.V.; Prinimali uchastiye: SHIYAN, V.G.; KHOKHLOV, P.L.; OLEYNIK, L.S.; SHEMYAKOVA, L.V.

Hot crack in tubes of nodular cast iron and ways to avoid them. Nauch. trudy Inst. lit. proizv. AN URSR 11:70-79 '62.

(MIRA 15:9)

(Pipe, Cast iron--Defects)
(Centrifugal casting)

POLISHCHUK, V. P.; TSIN, M. R.

Electromagnetic pumping of nonmetallic melts. TSvet. met. 35 no.10:82-83 O '62. (MIRA 15:10)

(Fused salts) (Pumping machinery, Electric)

ZATULOVSKIY, S.S.; TSIN, M.R.

Treatment of cast iron by magnesium in a counterflow. Lit. proizv. no. 5:14-15 My '61. (MIRA 14:5)
(Cast iron—Metallography)

S/128/62/000/008/001/003
A004/A127

AUTHORS: Gorshkov, A.A., Polishchuk, V.P., Tsin, M.R.

TITLE: Use of single-phase electromagnetic pumps in foundry practice

PERIODICAL: Liteynoye proizvodstvo, no. 8, 1962, 9

TEXT: In foundry practice, two types of induction pumps show the greatest prospects - three-phase and single-phase pumps. Three-phase pumps are more expediently employed in the continuous pumping of considerable metal quantities over a long distance, while single-phase pumps are more suitable for the intermittent pumping of smaller amounts of metal at low pressure. The metal filling a ring-shaped crucible constitutes the second winding of a single-phase transformer with the primary winding under the crucible. When the primary winding is switched on, currents are induced in the liquid metal that are interacting with the magnetic field of the transformer, while forces are originating in the metal striving for moving it upwards relative to the coil. During long-time standstills the pump can operate on a reduced voltage which keeps the metal in a liquid state. Single-phase pumps are applicable for proportioning and feeding the metal into pressure casting,

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Use of single-phase.....

chill-mold, and centrifugal casting machines. A brief description of the functioning of the proportioning pump in foundry practice is given and it is pointed out that the stresses originating in the metal may be used not only for filling the molds with metal, but also for producing pressure on the metal. There are 3 figures.

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GORSHKOV, A.A.; POLISHCHUK, V.P.; TSIN, M.R.

Use of single-phase electromagnetic pumps in foundries. Lit. proizv. no.8:9 Ag '62. (MIRA 15:11)
(Foundries--Equipment and supplies)

L 24587-66 EWT(d)/EWT(l)/EWT(m)/EWP(f)/EPF(n)-2/T/ETC(m)-6 WW/DJ

ACC NR: AP6009559 SOURCE CODE: UR/0413/66/000/005/0123/0123

AUTHORS: Tsin, M. R.; Polishchuk, V. P.

60
B

ORG: none

TITLE: Method for pumping nonconducting melts. Class 59, No. 179624

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 5, 1966, 123

TOPIC TAGS: electromagnetic pump, liquid flow

ABSTRACT: This Author Certificate presents a method for pumping nonconducting melts according to Author Certificate No. 136176. To increase the pressure head, the metal-melt division boundary is withdrawn from the region of the pump electromagnetic field influence. After the withdrawal of the metal-melt division boundary from the region of electromagnetic field influence, increased voltage is fed to the pump winding.

SUB CODE: 13/ SUBM DATE: 21Feb62

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UDC: 621.689

L 39646-66 EWT(m)/EWP(t)/ETI JD/GD-2
ACC NR: AP6002899 SOURCE CODE: UR/0286/65/000/024/0063/0063

AUTHOR: Tsin, M. R., Polishchuk, V. P.

ORG: none

TITLE: Method of preventing the formation of a columnar structure in casting thick-walled tubular products. Class 31, no. 177049

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 24, 1965, 63

TOPIC TAGS: pipe, alloy, melting, electromagnetic field, rotation, grain structure, metal casting

ABSTRACT: The method of preventing the formation of columnar structures in casting thick-walled tubular products from alloy melts is characterized by the fact that pulses of short duration from an electromagnetic field are intermittently applied to the melt at a constant rate of mold rotation in order to change the fusion rate.

SUB CODE: 11,13/ SUBM DATE: 03Mar62

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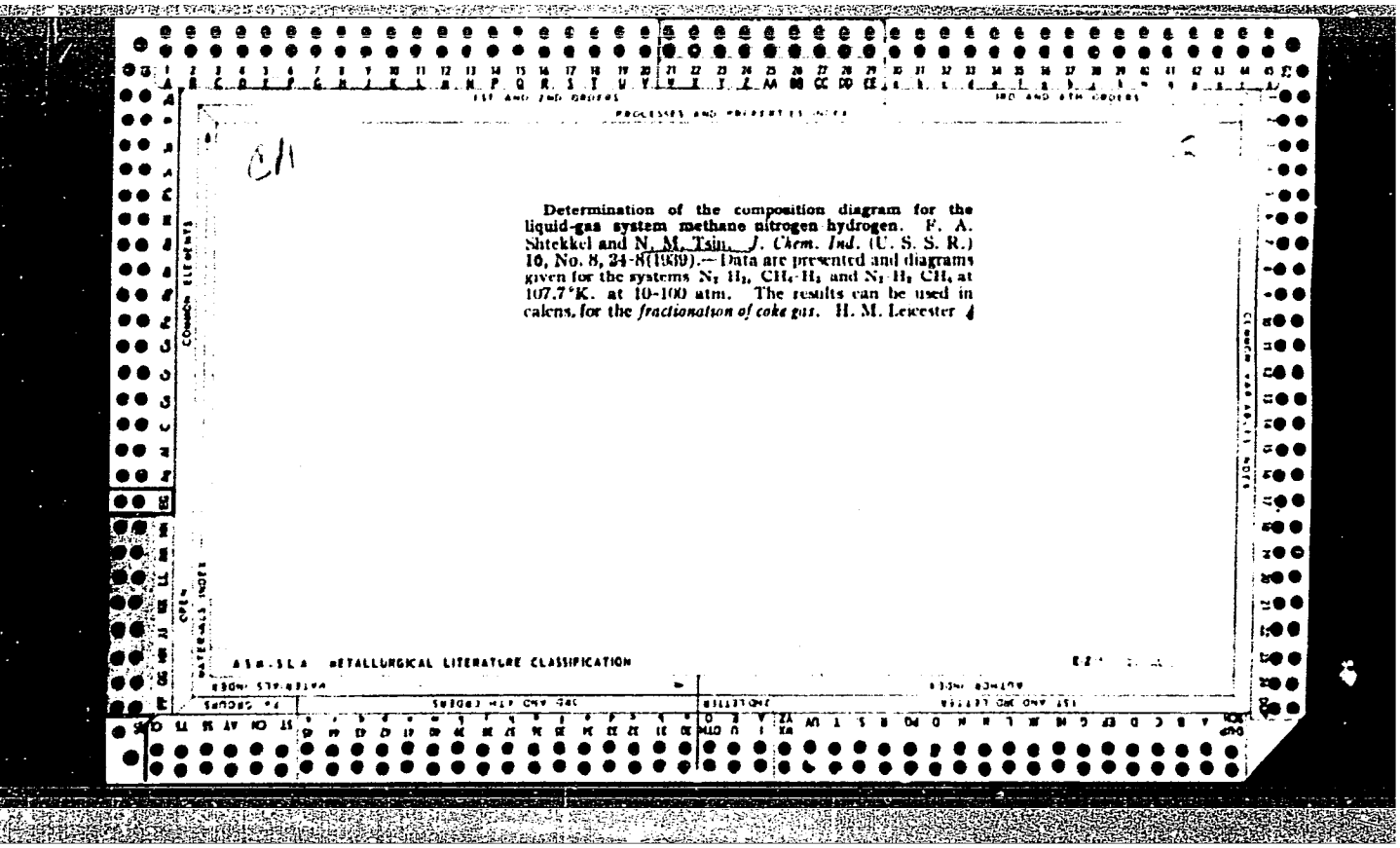
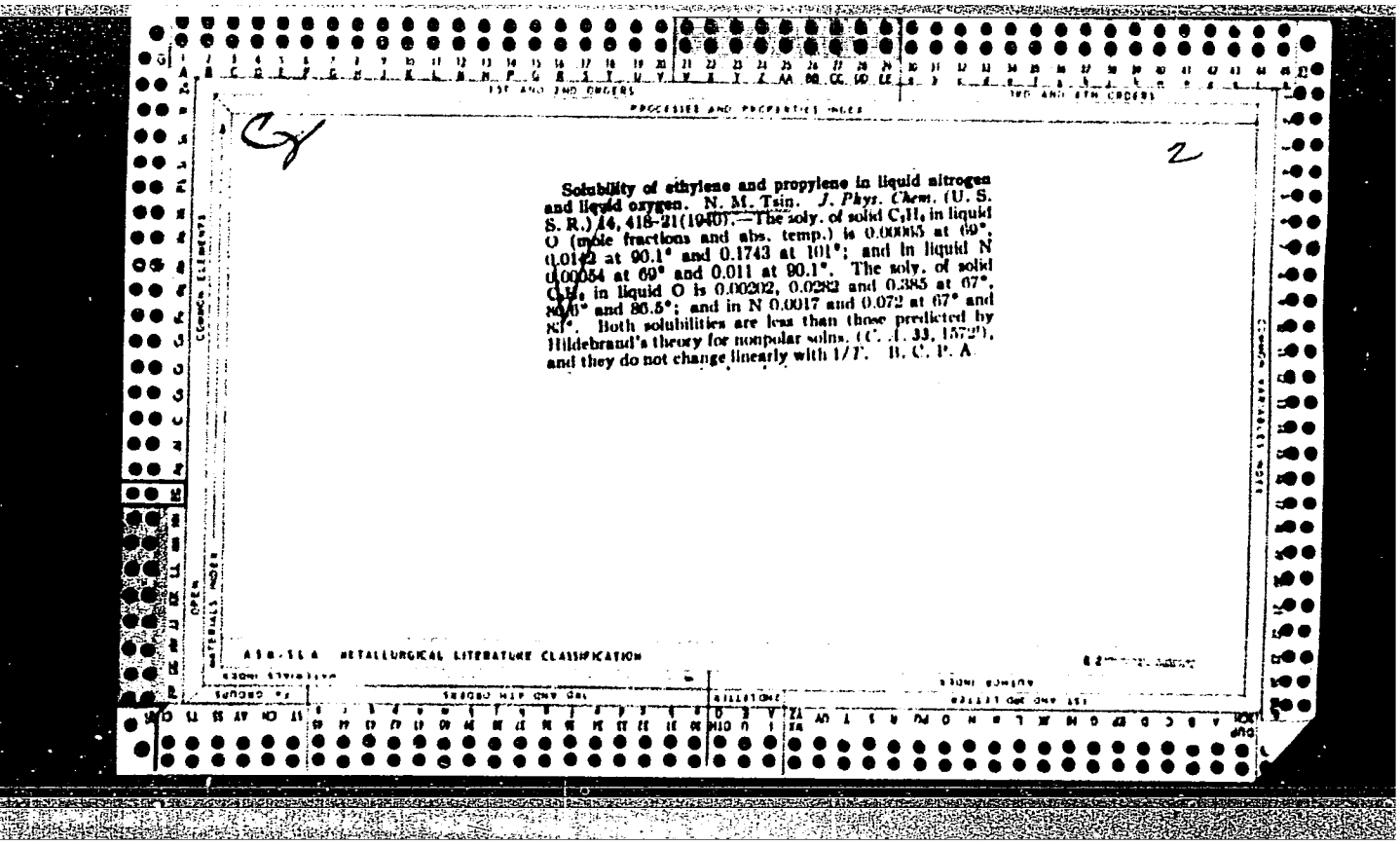


Determination of the composition diagram for the liquid-gas system methane nitrogen hydrogen. F. A. Shtekkel and N. M. Tsin. *J. Chem. Ind.* (U. S. S. R.) 16, No. 8, 24-8(1939).—Data are presented and diagrams given for the systems N_2 H_2, CH_4-H_2 and N_2-H_2 CH_4 at 107.7°K. at 10-100 atm. The results can be used in calcns. for the *fractionation of coke gas*. H. M. Lewester



Solubility of ethylene and propylene in liquid nitrogen and liquid oxygen. N. M. Tsin. *J. Phys. Chem.* (U. S. S. R.) 14, 418-21(1940).—The soly. of solid C_2H_4 in liquid O (mole fractions and abs. temp.) is 0.00085 at 69°, 0.0142 at 90.1° and 0.1743 at 101°; and in liquid N 0.00054 at 69° and 0.011 at 90.1°. The soly. of solid C_3H_6 in liquid O is 0.00202, 0.0282 and 0.385 at 67°, 86.0° and 86.5°; and in N 0.0017 and 0.072 at 67° and 85°. Both solubilities are less than those predicted by Hildebrand's theory for nonpolar solns. (C. A. 33, 1572°), and they do not change linearly with 1/T. B. C. P. A.

BOROVIK, Ye.S.; LAZARYEV, B.G.; TSIN, N.M.

Oil decomposition in diffusion pumps. Ukr.fiz.zhur. 2 no.1: 78-86 Ja-Mr '57. (MLRA 10:5)

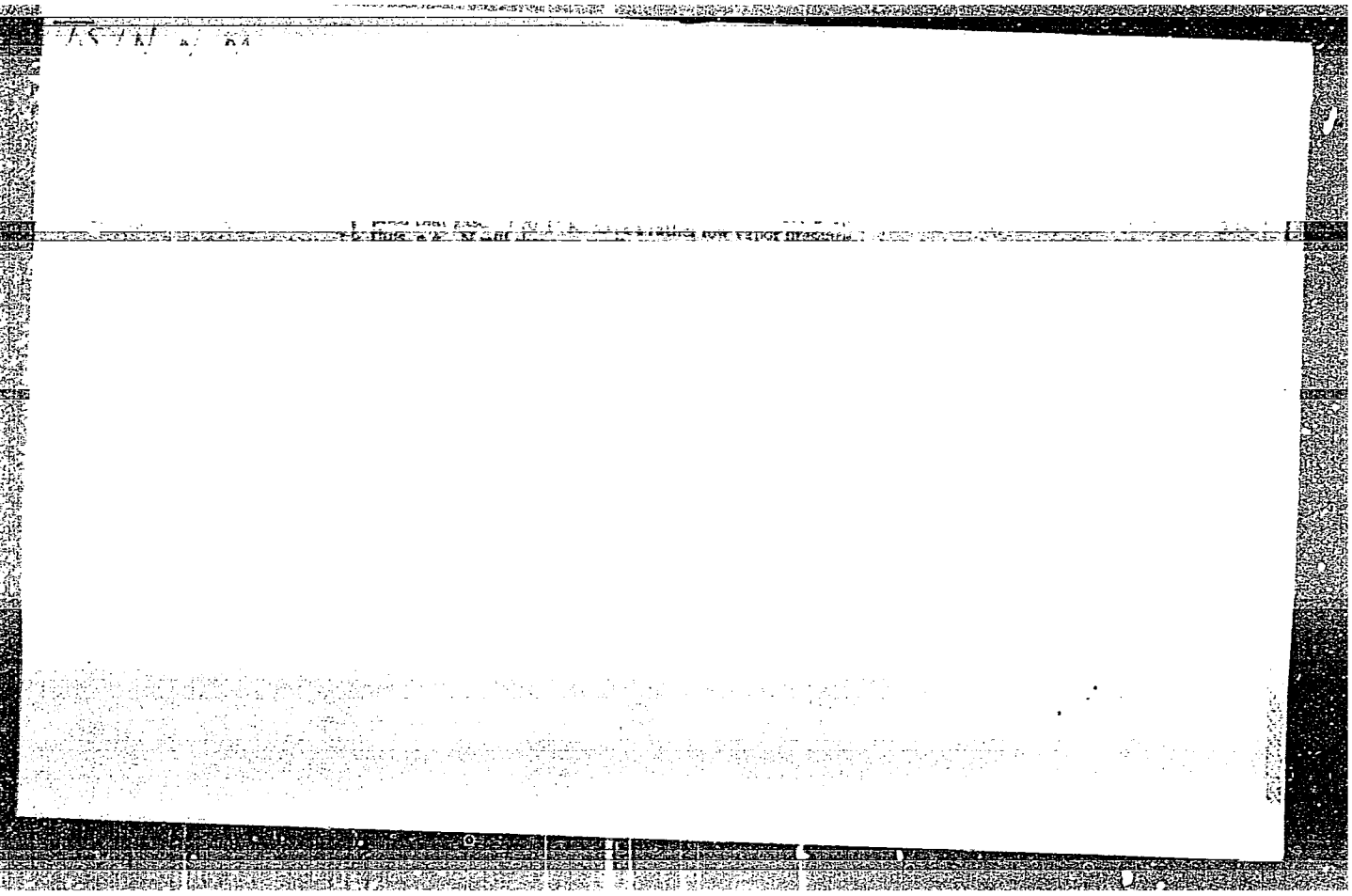
1. Fiziko-tekhnichniy institut AN URSR.
(Vacuum pumps)

M.

BOROVIK, Ye.S.; LAZARYEV, M.F.; FEDOROVA, M.F.; TSIN, N.M.

Improvement of diffusion pump properties by employing liquid nitrogen cooled traps. Ukr.fiz.zhur. 2 no.1:87-94 Ja-Mr '57. (MLRA 10:5)

1. Fiziko-tekhnichniy institut AN URSR.
(Vacuum pumps)



TSIN, N.M.

Controlling the operation of the ZhA-300 rectification column.
Zav. lab. 29 no.10:1271 '63. (MIRA 16:12)

1. Fiziko-tekhnicheskiy institut AN UkrSSR.

TSIN, N.M.

LAZARYEV, B.G.; BOROVIK, Ye.S.; FEDOROVA, M.F.; TSIN, N.M.

A hydrogen condensation pump. Ukr. fiz. zhur. 2 no.2:175-182 Ap-Je '57. (MIRA 10:6)

1. Fiziko-tekhnichniy institut Akademii nauk URSR.
(Vacuum pumps) (Hydrogen)

GLUZMAN, L.D.; NIKITENKO, A.G.; TSIN, R.M.

Production of crude pyrene. Koks i khim. no.1:52-55 '61.
(MIRA 14:1)

1. Ukrainskiy uglekhimicheskiy institut.
(Pyrene)

S/068/61/000/001/001/001
E071/E235

AUTHORS: Gluzman, L. D., Nikitenko, A. G. and Tsin, R. M.

TITLE: Production of Technical Pyrene

PERIODICAL: Koks i khimiya, 1961, No. 1, pp. 52-55

TEXT: Pyrene is one of the important raw materials for the production of dyes and for this reason, the authors carried out an investigation of the potential resources, methods of separation and treatment of narrow pyrene fraction suitable for the preparation of products of various qualities from coal tar. In the USSR the coal tar is treated mainly on continuous plants for the production of a standard medium temperature pitch. The production of a high temperature pitch is done not by steam distillation, but by oxidation with air. Therefore, the raw materials for the production of pyrene are not "steam" but "air" pitch distillates. The pitch distillates (from the Zaporozh'ye Coking Works) taken for the investigation had the following properties: s.g. 1.120 at 20°C, pyrene content 4.85%; beginning of boiling 140°, 10% at 280°, 19% at 300°, 30% at 336°; 40% at 355°, 52% at 382°, 60% at 393°, 72% at 410°, 80% at 421°C. The distillates were fractionated on a

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E071/E235

Production of Technical Pyrene

laboratory column equivalent to 13-15 theoretical plates. On distillation, two narrow pyrene fractions were collected: 1) 384-388°C amounting to 6.5% of the initial pitch distillate, containing 33.0% of pyrene and 2) 388-395°C amounting to 8% and containing 48.2% of pyrene. The raw pyrene fractions were submitted to recrystallisation from various solvents. Optimum results were obtained from 30% aqueous pyridine and 30% alcoholic solution of solvent naphtha. The crystallisation conditions and results obtained are tabulated. It was found that recrystallisation of raw pyrene fractions containing less than 40% of pyrene give a mixture of pyrene with fluoranthen, which cannot be further enriched by this method and repeated recrystallisations lead only to losses of pure products, e.g., after four recrystallisations of fraction containing 27% of pyrene a product containing about 45% of pyrene was obtained with pyrene recovery of 58.4%. Subsequent recrystallisations were ineffective. Fractions containing 40% and more of pyrene can be easily enriched to 75-80%. The more concentrated is the initial pyrene fraction, the more concentrated

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Production of Technical Pyrene

a recrystallisation product can be obtained, e.g., a fraction containing 52.6% of pyrene after double recrystallisation yielded 96-97% technical pyrene (from a mixture of petrol and solvent naphtha in a ratio of 1:1). In addition to pitch distillates, anthracene oil II was tested as a possible source of pyrene. Properties of the oil: beginning of boiling 251°C, at 308°C - 10%, at 318°C - 20%, at 327°C - 30%, at 334°C - 40%, at 342°C - 50%, at 349°C - 60%, at 365°C - 75%; pyrene content 1.32%. A narrow pyrene fraction obtained from this oil contained 29% of pyrene and about 70% of fluoranthen. This fraction could not be sufficiently enriched by recrystallisation therefore, anthracene oil II can be used for the production of fluoranthene and not of pyrene. It is concluded that technical pyrene of 96-97% purity can be obtained from pitch distillates with a recovery of pyrene of about 70% and of 70-80% purity with a recovery of pyrene about 80%. The head fraction obtained on rectification of pitch distillates after the removal of crystals can be used as an impregnation oil for sleepers and in the raw state as a material

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