BEREZKIN, P.N., red.; ABARINOV, A.A., prof., retsenzent; YES'KOV, K.A., dots., retsenzent; FILIMONOV, A.N., inzh., retsenzent

[Mechanization and automation in welding; practices of Ural plants] Mekhanizatsiia i avtomatizatsiia svarochnogo proizvodstva; opyt ural'skikh zavodov. Moskva, Mashinostroenie, 1965. 155 p. (MIRA 18:6)

1. Sektsiya svarki Chelyabinskogo nauchno-tekhnicheskogo obshchestva mashino-stroitel'noy promyshlennosti (for Yes'kov).

KHOKHLOV, V.D.; FILIMONOV, A.P.

Instrument for measuring the velocity of the thread motion.
Tekst. prom. 20 no. 12:53-55 D '60. (MIRA 13:12)
(Textile machinery--Testing)

FILIMONOV, A.P.

The AT4-120-2 automatic four-shuttle loom. Biul.tekh.-ekon. inform. no.12:54-57 '61. (MIRA 14:12)

(Looms)

FILIMONOV, A.P., inzh.

Modernized design of UPS tying-in machines. Tekst.prom. 21 no.9:50 S '61. (MIRA 14:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut legkogo i tekstil'nogo mashinostroyeniya.
(Textile machinery)

FILIMONOV, A.P.

The UP-1 universal tying-in machine. Biul.tekh.-ekon.inform. no.2:51-53 '62. (MIRA 15:3)
(Textile machinery)

FILIMONOV, A.P.

The AT-140-UV5 automatic single-shuttle loom. Biul.tekh.-ekon.inform.-Gos.nauch.-issl.inst.nauch. i tekh.inform. no.8:58-59 '62. (MIRA 15:7)

(Looms)

FILIMONOV, A. P.

The ATT-120-S automatic loom. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch. i tekh.inform. no.10:54 '62. (MIRA 15:10)

(Looms)

FILIMONOV, A.S., inzh.

Efficiency promoters from the fishing fleet. Biul. tekh.-ekon.-inform. Tekh. upr. Min. mor. flota 7 no.5:109-113 '62. (MIRA 16:3)
(Ships--Maintenance and repair)

FILIMONOV, A.S., kontr-admiral; PATRIKEYTSEV, M.V., kapitan 1-go ranga zapasa

Antiaircraft defense at sea. Mor. sbor. 48 no.4:95-96 Ap '65.
(MIRA 18:6)

LYAKHOVSKIY, A.M., inzhener; FILIMONOV, A.S., inzhener.

Standard precast pallet-type forms for making reinforced cement roofing slabs for flat roofs. Rats. i izobr.predl. v stroi. no.120:22-28 '55. (MIRA 9:7)

(Precast concrete) (Concrete slabs)

SOV-127-58-10-23/29

AUTHOR: Filimonov, A.T., Mining and Electro-Mechanical Engineer

TITLE: The Drill ShBS - 130 (Burovoy snaryad ShBS - 130)

PERIODICAL: Gornyy zhurnal, 1958, Nr 10, pp 73-74 (USSR)

ABSTRACT: The drill ShBS-130 is presently undergoing tests at the Dzhezkazgan Mine. It is a drill of quite new construction, without bench or bars, which penetrates completely into the bore-hole. It is composed of 3 parts: percussion drill, a rotor and a pneumatic feeder. It is designed for boring holes 35 m deep in hard rocks. Its weight is about 90 kg. Its technical boring speed is 24-27 mm/min. Maximal productivity in 1 shift is 14.2 m. There are 2 diagrams and 1 photo.

ASSOCIATION: Dzhezkazganskiy rudnik (The Dzhezkazgan Mine)

1. Mining industry--USSR 2. Drilling machines--Performance

Card 1/1

SOV-127-58-10-24/29

AUTHOR: Filimonov, A.T., Mining and Electro-Mechanical Engineer

TITLE: Rockloading Machine (Shtrekouborochnaya mashina)

PERIODICAL: Gornyy zhurnal, 1958, Nr 10, pp 75-76 (USSR)

ABSTRACT: In order to mechanize the loading of rocks during the process of drifting haulage galleries, the workshop of the Nr 51 mine of the Dzhezkazganskoye rudoupravleniye (The Dzhezkazgan Mining Administration) constructed an experimental rock-loading machine. It is assembled on the base of the electric locomotive II - TR - 2g and is composed of two parts - a multi-bucket conveyor and a rotary-brushing mechanism, which sweeps small pieces of rock and refuse into the gutter, from which they are evacuated by the bucket conveyor. First tests showed that many parts of the machine have to be changed, to mechanize its secondary operations. There are 3 diagrams.

ASSOCIATION: Dzhezkazganskiy rudnik (The Dzhezkazgan Mines)

1. Rock--Handling

Card 1/1

BAYKONUROV, O.A., prof.; KOVRIGO, A.F., dotsent; FILIMONOV, A.T., inzh.

Vibration and combination drilling of holes in hard rocks.
Gor. zhur. no.9:35-37 S '62. (MIRA 15:9)

1. Kazakhskiy politekhnicheskiy institut, Alma-Ata.
(Boring)

FILIMONOV, A.T.

Two-chamber air drill. Gor. zhur. no.6:78 Je '63. (MIRA 16:7)
(Boring machinery--Pneumatic driving)

FILIMONOV, A.V.

Removal of alcohol from acid water at the Amzinskii Wood Chemical Plant. Gidroliz. i lesokhim. prom. 10 no.3:22 '57. (MLRA 10:5)

1. Amzinskiy lesokhimicheskiy zavod.
(Alcohol) (Distillation)

FILIPPOV, B.N.; FILIMONOV, A.V.

Continuous countercurrent process of the decolorization and neutralization of crude ethyl acetate. Gidroliz.i lesokhim. prom. 12 no.8:20-22 '59. (MIRA 13:4)

1. Amzinskiy lesokhimicheskiy kombinat.
(Asha--Ethyl acetate)

FILIMONOV, A.V., kand. tekhn. nauk; GORODNOV, P.I.; PANTELEYEV, V.F.

Automatic line for manufacturing pins. Mashinostroitel' no.10:7 O '65. (MIRA 18:10)

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413030005-5"

Filimonov, B

AUTHOR: Filimcnov, B., Cheboksary 107-8-51/62

TITLE: Experience Exchange. Rewinding a Soldering Iron (Obmen opytom. Peremotka payal'nika)

PERIODICAL: Radio, 1957, Nr 8, p.54 (USSR)

ABSTRACT: Rewinding a soldering iron without the use of mica can be done as follows: The body of a soldering iron is coated with a layer of silicate (office) glue, which is afterwards fired over a sootless flame until it forms a fireproof foam. This insulating process is repeated several times. Then the winding is done as usual and its surface is again coated with glue and fired in the same manner (firing by electric current is not feasible since the wet glue conducts electricity). Finally, the heating element is wound with an asbestos cord and covered by a sleeve.

AVAILABLE: Library of Congress

Card 1/1

6(4) SOV/107-58-12-28/55

AUTHOR: Filimonov, B. (Cheboksary)

TITLE: Antenna Insulators (Antennyye izolyatory)

PERIODICAL: Radio, 1958, Nr 12, p 26 (USSR)

ABSTRACT: The author describes how to make high-quality antenna insulators out of seven-pin ceramic panels for bantam tubes by removing the central binding piston and inserting a brass bolt as a conductor.

Card 1/1

FILIMONOV, B.

Load factors in the operation of sports gliders.
Kryl.rod. 13 no.6:20 Je '62. (MIRA 19:1)

8(0), 5(0)

SOV/112-59-4-7667

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 4, p 174 (USSR)

AUTHOR: Yelshin, N. N., and Filimonov, B. A.

TITLE: Automating the Synthetic-Rubber and Synthetic Alcohol Industry

PERIODICAL: V sb.: Avtomatiz. khim. i koksokhim. proiz-v. M., Metallurgizdat, 1958, pp 147-173

ABSTRACT: Briefly described are automation schemes of the following synthetic-rubber and synthetic-ethyl-alcohol production processes: contact decomposition of alcohol, production and purification of divinyl, emulsion polymerization, hydrocarbon pyrolysis, hydrocarbon-gases segregation, and direct hydration of ethylene. The degree of automation at foreign plants is characterized. Requirements for a complex automation are listed.

A.A.S.

Card 1/1

FILIMONOV, B.F.

4

Synthesis of divinyl esters of dibasic acids. M. F. Shostakovskii, G. M. Bogr, and B. F. Filimonov. Zhur. Priklad. Khim. 30, 815-19 (1957). —Mixts. of a dibasic acid, [illegible] vinyl acetate [illegible] and [illegible] H_2SO_4 were boiled [illegible] [illegible] After cooling [illegible] [illegible], it was distd. up to 120° at atm. pressure and then in vacuo. The amt. of each ingredient [illegible] given, the yield, and the b. p. of the esters [illegible] [illegible]

[illegible]

I. Bencowitz

Filimonov, B.F.

Synthesis of some diallyl esters of dibasic acids. M. F. Shostakovskii, A. M. Sinir, and B. F. Filimonov. *Zhur. Priklad. Khim.* 30, 971-4(1957).—The acid, allyl alc., C_6H_6, and H_2SO_4 mixt. was heated by the azeotropic method in a Dean-Stark flask till the vol. of the lower layer in the trap remained const., washed twice with H_2O, once with soda, and again with H_2O, the product dried with anhyd. Na_2SO_4, the C_6H_6 driven off, and the residue fractionated *in vacuo*. The proportions originally used (in the order given), the duration of the reaction, and the yield and properties (b.p., d_4, n_D^{20}) of the esters obtained were as follows: glutaric acid, m. 97°, 8.6 g., alc. 35 ml., C_6H_6 10 ml., H_2SO_4 1 ml., 4 hrs., 68%, b_3 110°, 1.0183, 1.4520; diglycolic acid, m. 146-8°, 8.6 g., 35 ml., 10 ml., 1 ml., 4.2 hrs., 50.3%, $b_{4.5}$ 139-40°, 1.1040, 1.4530; pimelic acid, m. 101-3°, 0.5 g., 50 ml., 30 ml., 0.8 ml., 15 hrs., 92%, b. 145-7°, 1.0110, 1.4503; $O(CH_2CH_2CO_2Et)_2$ (I), —, 16.5-27 g., 41-100 ml., 16-35 ml., 1-1.7 ml., 6-25 hrs., 50-85%, b_1 131-3°, 1.0579, 1.4542; $(CH_2OCH_2CH_2CO_2H)_2$ (II), m. 62.3°, 20.6 g., 27 ml., 16 ml., 1 ml., 6 hrs., $b_{2.4}$ 163-5°, 1.0509, 1.4613. Esterification of pimelic acid, I, and II was carried out with 70% alc. I was prepd. by Bruson's method (*C.A.* 40, 347[1]) and II by cyanoethylation (cf. Nazarov, *et al.*, *C.A.* 49, 4514*h*). I was a noncryst. mixt. contg. 91.2% pure acid (by titration). The allyl esters when heated with Bz_2O_2 30-5 hrs. in sealed tubes formed soft, jelly-like polymers. Copolymerization (5 hrs.) with divinyl esters of adipic, pimelic, and sebacic acids gave clear, colorless resins, the hardness of which was a function of the proportions of the original monomers. All polymers and copolymers were insol. in C_6H_6 or in Me_2CO.

I. Bencowitz

SHUR, A.M.; FILIMONOV, B.F.; FILIMONOVA, M.M.

Polarographic study of the polymerization rate of diallyl adipates. Vysokom.soed. 3 no.11:1661-1663 N '61. (MIRA 14:11)

1. Kishinevskiy gosudarstvennyy universitet.
(Adipic acid) (Polymerization)

VOROB'YEV, N.V., zasluzhennyy deyatel' nauki i tekhniki Udmurtskoy ASSR.;
IVASHKOV, I.I., kand.tekhn.nauk; FILIMONOV, B.N., inzh.

Improving the quality of chain transmissions. Vest.mashinostr.
43 no.5:13-17 My '63. (MIRA 16:5)
(Chains)

[illegible], B.N., [illegible]

[illegible] specific pressure on the wear of bushed-roller chains. Izv. vys.ucheb.zav.;mashinostr. no.5:182-89 '62. (MIRA 16:2)

1. [illegible]skiy mekhanicheskiy institut.

FILIMONOV, B.N., starshiy prepodavatel'.

Investigating the strength of bushed-roller chain connections. Izv. vys. ucheb. zav.; mashinostr. no.5:67-74 '65. (MIRA 18:11)

ANDREYEV, N.G., doktor sel'skokh. nauk, prof.; FILIMONOV, D.A., aspirant

Practices in improving degenerated pastures. Izv. TSKHA no.1: 20-28 '63. (MIRA 16:7)

(Pastures and meadows--Fertilizers and manures)

Filimonov, D.I.

PHASE I BOOK EXPLOITATION 19 SOV/6162

Trubin, V. N., Candidate of Technical Sciences, and I. Ya. Tarnovskiy, Doctor of Technical Sciences, eds.

Kovka krupnykh pokovok; rezul'taty issledovaniya tekhnologicheskikh rezhimov (Production of Heavy Forgings; Results of a Study of Technological Methods). Moscow, Mashgiz, 1962. 223 p. 3800 copies printed.

Reviewer: O. A. Ganago, Candidate of Technical Sciences; Tech. Ed.: N. A. Dugina; Executive Ed. of Ural-Siberian Department (Mashgiz): E. L. Kolosova, Engineer.

PURPOSE: This book is intended for engineering personnel of forging shops and engineering and design offices at heavy-machinery plants, as well as for those working in scientific-research and planning organizations. It may also be useful to students at higher educational establishments.

Card 1/6

17

COVERAGE: The book reviews technological problems of forging large steel ingots. The effect of reduction and conditions of deformation on the quality of forgings is discussed on the basis of research work done at heavy-machinery plants of the USSR. The book offers practical suggestions on improving the quality of large forgings and reducing the amount of labor required to produce them. I. Ya. Chernikhova, V. I. Tarnovskiy, and V. P. Bakharev took part in preparing the copy for publication. There are 193 references, mostly Soviet.

TABLE OF CONTENTS:

FILIMONOV, D.V.

Improved technology for processing sheep pelts. Kozh.-obuv.prom. 2 no.4:32-33 Ap '60. (MIRA 13:9)

1. Glavnyy inzhener Tyumenskogo kozhevenno-shubnogo zavoda.
(Fur)

FILIMONOV, F. (g. Vol'sk); KHMELEVSKIY, I., matematik

Secret of the Sargasso Sea. Tekh.mol. no.1:24-25 '61.
(MIRA 14:3)

(Sargasso Sea) (Moon, Theory of)

L 40439-65 EWT(1) IJP(c)

ACCESSION NR: AP5007057 S/0120/65/000/001/0194/0198

AUTHOR: Shepelev, A. G.; Filimonov, G. D.

TITLE: Outfit for studying absorption of h-f ultrasonic radiation by superconductors

SOURCE: Pribory i tekhnika eksperimenta, no. 1, 1965, 194-198

TOPIC TAGS: ultrasonics, ultrasonic absorption, superconductor

ABSTRACT: An outfit is described which is intended for studying the absorption-temperature relation at 4—1 K by a pulse method. The outfit comprises (see Enclosure 1) sync unit 9 which controls negative pulses in modulator 7 which modulates the oscillations of h-f (up to 300 Mc) oscillator 3; the oscillator pulses excite transmitting quartz 1; from receiving quartz 2, the pulses enter receiver 5. Signals from the specimen and comparison pulses from 6, after amplification and detection in 4, arrive at oscilloscope 8 where a series of pulses corresponding

Card 1/3

L 45439-65

ACCESSION NR: AP5007057

6

to the multiple reflection of ultrasonic radiation by parallel surfaces of the specimen can be observed. The low-temperature unit consists of three insulated glass Dewar vessels (one with nitrogen and two with helium) which are arranged concentrically (sketch supplied). "The authors wish to thank K. D. Sinel'nikov for his support and attention to the work, B. G. Lazarev and A. P. Korolyuk for their valuable advice, N. N. Mikhaylov for lending the carbon thermometers, and A. I. Bordovskiy for his help in installing the outfit." Orig. art. has: 6 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR (Physico-Technical Institute, AN UkrSSR)

SUBMITTED: 02Sep64 ENCL: 01 SUB CODE: GP

NO REF SOV: 010 OTHER: 002

Card 2/3

L 52957-65 EWT(l)/EWT(m)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA (c) IJP(c) JD/GG

ACCESSION NR: AP5010497 UR/0056/65/048/1054/1061

43
36
B

AUTHOR: Shepelev, A. G.; Filimonov, G. D.

TITLE: An investigation of energy gap anisotropy in superconducting tin 27

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 4, 1965, 1054-1061

21

TOPIC TAGS: tin, superconductivity, energy gap, ultrasound absorption, electronic absorption, single crystal, anisotropy

ABSTRACT: New experimental data are presented on electronic absorption of ultrasound up to 300 Mcs in pure tin single crystals at 1--4K, obtained by investigating experimentally the temperature dependence of the absorption in several new directions of ultrasound propagation in the crystal. The samples were spherical single crystals grown by the Obreimov-Shubnikov method. The directions of the acoustic wave vectors were perpendicular to all the crystallographic planes of low indices, determined goniometrically from the reflection spot pattern following etching. The ultrasound was fed to the samples from an oscillating crystal through a thin vacuum-cooked layer of a rubber and vaseline mixture. The ultrasound passing through the

Card 1/2

L 52957-65
ACCESSION NR: AP5010497

sample excited a quartz receiver, the output of which was amplified and compared with a comparison pulse from a standard generator. A detailed description of the apparatus is published elsewhere (PTE No. 1, 194, 1965). The values obtained for the energy gap in the electron spectrum of superconducting tin are used to map the anisotropy of the gap on the Fermi surface. The gap values obtained range from a minimum of 3.2 kT_C to a maximum of 4.8 kT_C, compared with a minimum value 2.7 kT_C obtained by N. V. Zavaritskiy (ZhETF v. 45, 1839, 1963). The results indicate that the energy gap of superconducting tin has an anisotropy of 70%. "The authors thank K. D. Sinel'nikov for interest in the work and support, and N. V. Zavaritskiy, M. I. Kaganov, B. G. Lazarev, V. L. Pokrovskiy, and I. A. Privorotskiy for interesting discussions." Orig. art. has: 4 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physico-technical Institute, Academy of Sciences UkrSSR)

SUBMITTED: 12Nov64 ENCL: 00 SUB CODE: SS, GP

NR REF SOV: 019 OTHER: 014

BRE

Card 2/2

L 02195-67 EWT(d)/EWT(l)/EWT(m)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/WW/AT

ACC NR: AP6032470 SOURCE CODE: UR/0056/66/051/003/0746/0748

AUTHOR: Shepelev, A. G.; Filimonov, G. D. 64 58

ORG: Physicotechnical Institute, Academy of Sciences Ukrainian SSR (Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR) B

TITLE: Experimental investigation of the frequency dependence of electron absorption of ultrasound in tin single crystals of various crystallographic orientations

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 51, no. 3, 1966, 746-748

TOPIC TAGS: low temperature physics, low temperature effect, ultrasound absorption, temperature dependence, tin single crystal, crystal orientation

ABSTRACT: The temperature dependences of electron absorption of ultrasound in pure tin single crystals were measured by the pulse technique in the frequency range from 90 to 280 Mc/sec, and temperatures between 1 and 4K; the sound wave vectors were perpendicular to the crystallographic planes (101), (111), (301), (112), (211), (113), and (311). In accordance with the theory, the electron absorp-

L 02195-67

ACC NR: AP6032470

6

tion frequency dependences are linear and strongly anisotropic. The authors express their gratitude for discussing results of the investigation to A. A. Galkin, M. I. Kaganov, E. A. Kaner, B. G. Lazarev, I. M. Lifshits, and V. G. Peschanskiy. Orig. art. has: 2 figures. [Based on authors' abstract]

SUB CODE: 20/ SUBM DATE: 20Mar66/ ORIG REF: 004/ OTH REF: 004/

Card 2/2 egk

FILIMONOV, G. F.

FILIMONOV, G. F. --"The Problem of Relativistic Corrections to the Terms of the Atoms of the Light Elements." Moscow State U imeni M. V. Lomonosov, Moscow, 1955. (Dissertations for the Degree of Candidate in Physicomathematical Science)

SO: Knizhnaya Letopis', No.39, 24 Sept 55

FILIMONOV, G.F.

Distr: 4E3d/4E4c

4/2

6002

MULTIPLE INTERACTION HAMILTONIANS IN QUANTUM ELECTRODYNAMICS, G. F. Filimonov and A. M. Shirokov. (Moscow State Univ.). Soviet Phys. JETP 5, 84-8(1957) Aug.

A method is described for constructing electromagnetic interaction Hamiltonians of a many-particle system, based on the usual Hamiltonian formalism. For illustration the Hamiltonian for the pair interaction of spinor particles is derived. (auth)

1/1

JR

AUTHOR: FILIMONOV,G.F., ŠIROKOV,JU.M. PA - 2064

TITLE: Plural Interaction Hamiltonians in Quantum Electrodynamics (Gamiltoniany množestvennych vzaimodejstvii v kvantovoj elektrodinamike, Russian)

PERIODICAL: Zhurnal Eksperimental'noi i Teoret.Fiziki, 1957, Vol 32, Nr 1, pp 99-104 (U.S.S.R.)
Received: 3 / 1957 Reviewed: 4 / 1957

ABSTRACT: By the research work carried out by SCHWINGER we know how to determine GREEN'S function and how to set up and to solve the corresponding equation. The present paper discusses another method for the description of elementary interactions of which a complicated motion of a system on N particles is composed. Instead of a set of particles a set of Hamiltonians of plural interactions is coordinated to the system of N particles. Each of these Hamiltonians corresponds to a process with a strictly determined number of real and virtual particles. This method is suited for the simpler calculation of the relativistic- and field corrections to the optical spectra of those atoms which are produced by the plural interaction of particles.
An explicit expression for the Hamiltonians of N-th order, which also contains the term of the N-fold interaction, can

PA - 2064

Plural Interaction Hamiltonians in Quantum Electrodynamics.

be obtained from the usual equation of electrodynamics: $(\hat{E} - \hat{\mathcal{H}})\,\Psi(x) = 0$; $\hat{\mathcal{H}} = \sum_{j=0}^{\infty} \hat{H}_j$. The writing down of the Hamiltonian of n-th order by summating the processes with all possible intermediary conditions offers a number of advantages which make this method suited for the solution of concrete problems: 1.) In each approximation (in each H_N) the relativistic invariance of the method is warranted because terms are only classified according to the number of particles described by them. 2.) The "provisional" summation of the intermediary conditions in the Hamiltonian of interaction makes the perturbational calculation of higher approximations of interactions unnecessary and does therefore not require a knowledge of the complete sets of the eigenfunctions of the system in question in zero-th approximation. The kinetic corrections of the orders required for the terms of atoms are simply determined by the matrix elements of the corresponding Hamiltonians.

Card 2/3

3.) Here, like in the case of the development of the S-matrix, in a power series a regulation "by terms" is possible, in which case the removal of field divergences of each Hamiltonian of N-th order also means its removal from the corresponding approximations of the theory.

The determination of the Hamiltonians of N-th order is discussed step by step. By means of certain transformations all effects (apart from the truly energetic parts) can be excluded from the equation of motion. As an example the interaction in pairs of the spinorial particles is dealt with in detail.

ASSOCIATION: Moscow State University
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress

AUTHOR FILIMONOV G.F. PA - 2677

TITLE Level shifts in helium. Triple forces. (Sdvig urovney geliya Eroyniye sily, - Russian)

PERIODICAL Zhurnal Eksperim. i Teoret. Fiziki 1957, Vol 32, Nr 2, pp 311 - 315 (USSR).
Received: 5/1957 Reviewed: 6/1957

ABSTRACT The present work contains an expression for the HAMILTONIAN of interaction between two fields of the fourth order. This expression contains triple forces.
The effect of triple interaction in a system of three particles contains no field divergences and the HAMILTONIAN of this effect can easily be written down in SCHRÖDINGER representation. For this purpose the author employs the following formula:

$$(i\partial/\partial t + \mathcal{H}_3)\,\psi(\vec{r}, t) = O;\ \mathcal{H}_3 = e^{-iS_3}\left[e^{-iS_2}\left(e^{-iS_1}\,\mathcal{H}e^{iS_1}\right)e^{iS_2}\right]e^{iS_3}.$$

The original HAMILTONIAN of the system, namely $\mathcal{H} = H_o + H_1^{tr} + H_2^1$ consists of the HAMILTONIAN of the free field (H_o), the interaction of the particles with the transversal photons (H_1^{tr}), and COULOMB'S interaction. The individual terms of the HAMILTONIAN are here specialized for helium and explicitly written down. From these expressions, among others, the following

CARD 1/3

Level shifts in helium. Triple forces.

results are obtained: Already in the case of two fields which are in interaction by the medium of a third, the HAMILTONIANS consist of physically different summands of first and second order. It is shown in what way the HAMILTONIAN of the fourth order H_4 can be freed from superfluous summands; the resulting expression for H_4 is explicitly given.
Next, the HAMILTONIAN H_4 is used for the computation of the relativistic corrections to the terms of the He atom. The expressions for approximation for these components H'_4 (which are able to modify the terms E_n^o of helium noticeably) are given here. Triple collisions of an α particle and two electrons do not lead to an "ultraviolet catastrophe" and the corresponding term may easily be written down in SCHRÖDINGER representation. The operators occurring therein and the corresponding matrix element are written down. By graphical computation by means of a trinominal solution by HYLLERAAS the value $\Delta_1\,{}^3E$ = $(1,02 \pm 0,15)$ cm^{-1} is obtained for the level $1\,{}^1S$ of the He. Contributions of the various summands to this value are discussed. Not all corrections of the fourth order were taken into account for the computations discussed here. In consideration

CARD 2/3

of various circumstances shown here it ought to be possible, in the theory of the helium atom, to attain agreement between theory and experiment.
(No illustrations and tables.)

ASSOCIATION: Moscow State University
PRESENTED BY: -
SUBMITTED: 13. 11. 1955.
AVAILABLE: Library of Congress.

CARD 3/3

FILIMONOV, G. F.

109-1-9/18

AUTHORS: Vaynshteyn, L.A. and Filimonov, G.F.

TITLE: Nonlinear Theory of the Travelling-Wave Tube. Part III: Influence of the Space-Charge Forces. (Nelineynaya teoriya lampy begushchey volny. Ch.III: Vliyaniye sil rastalkivaniya)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol.III, Nr 1, pp.80-84 (USSR)

ABSTRACT: The nonlinear equations (see Ref.1) of the travelling-wave tube contain the following normalised coefficients: a complex parameter $\xi = \xi' + i\xi''$, whose real part represents the relative velocity of the electron beam in the steady state, while the imaginary part represents the attenuation of the wave; a parameter σ which determines the relative magnitude of the space charge forces and is proportional to the volume charge density in the beam; and r, which is the effective radius of the electron beam. The operation of the tube for $\sigma = 0$ was considered in an earlier paper (Ref.2). In the present work the influence of σ is taken into account and the investigation is based

Card 1/3

109-1-3/18

Nonlinear Theory of the Travelling-Wave Tube. Part III: Influence of the Space-Charge Forces

on a numerical solution of the basic equations given in the previous work (Ref.2). The solutions are found for ξ' contained in the limits $\xi_0 \leqslant \xi' \leqslant \xi_m$, where ξ_0 corresponds to the maximum and ξ_m to the minimum gains of the tube as evaluated from the linear theory for a given σ. The region in which $\xi' < \xi_0$ is not considered since it is of no interest in view of the fact that the power p_{max} in this region is very low. The values of σ range from 0 to 2, which coresponds to the normal experimental conditions. The calculated results are shown in Figs.1 and 2. The curves of Fig.1 represent p_{max} as a function of ξ' for three different values of σ, while Fig.2 represents p_{max} as a function of σ for $\xi' = \xi_0$ and for $\xi' = \xi_m$. Further results are illustrated in Figs.3, 4 and 5 in which the relative power of the field is plotted as a function of the length coordinate, ζ. These curves are plotted for various values of ξ'', σ and A (A denotes the

Card 2/3

109-1-9/18

Nonlinear Theory of the Travelling-Wave Tube. Part III: Influence of the Space-Charge Forces

amplitude of the input signal). The effect of the finite cross-section of the electron beam is illustrated in Figs.6 and 7. Two curves of p_{max} against $1/r$ are plotted in Fig.6 while Fig.7 shows p_{max} versus σ for r ranging from 0.1 to ∞. The authors thank P.S. Mikazan, O.A. Merkulova and V.M. Khapayeva, who prepared the programme for the computer used in the numerical solution of the equations. There are 8 figures and 7 references, 2 of which are Russian, 4 English and 1 French.

SUBMITTED: November 29, 1956

AVAILABLE: Library of Congress

Card 3/3

FILIMONOV- G. F.

109-1-10/18

AUTHOR: Filimonov G.F.

TITLE: An Isochronous Travelling-Wave Tube (Izokhronnaya lampa begushchey volny)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol.III, Nr 1, pp.85-93 (USSR)

ABSTRACT: It is well-known (Refs.1-4) that the power of the slowed-down wave in a travelling-wave tube increases only as long as the electron bunch remains in the decelerating field of the wave. As soon as the bunch leaves the decelerating space, the particles gain speed and extract energy from the field. In view of the above, it is of importance to investigate the problem of increasing the duration of the period during which the electrons remain in the decelerating field. The problem is tackled on the basis of the equations derived by Vaynshteyn (Ref.2) which are in the form of:

$$\frac{d}{d\zeta} F(\zeta) - i\xi F(\zeta) = - J_1(\zeta) \quad ,$$

Card 1/5

An Isochronous Travelling-Wave Tube.

$$-\frac{\delta^2}{\delta\zeta^2}u(\zeta,t_0) = \mathrm{Re}\left\{F(\zeta)e^{-iu(\zeta,t_o)} - i\sigma^2\sum_{n=1}^{\infty}\frac{1}{n}J_n(\zeta)e^{-inu(\zeta,t_o)}\right\},$$

$$J_n(\zeta) = \frac{1}{\pi}\int_0^{2\pi} e^{inu(\zeta,\ t_o)}\,dt_0 \quad , \qquad (1)$$

where ζ , $u(\zeta,t_0)$ and t_0 are the normalised coodinate of an electron, its phase in the system of coordinates (having an initial velocity v_0) and the initial time of the electron, respectively. $F(\zeta)$ and $J_n(\zeta)$ are the slowly changing normalised amplitudes of the fundamental of the field and of the n^{th} harmonic of the current, respectively.

An Isochronous Travelling-Wave Tube.

$\xi = \frac{v - U}{\varepsilon U_0}$, ε and σ^2 are the parameter of the electron velocity shift with regards to the wave in a "cold" tube, a small parameter and a Coulomb forces parameter, respectively. If it is assumed that the system of the coordinates has the velocity of the slowed-down wave, the phase of an electron can be described by Eqs.(2), and its average value is given by Eq.(3), which should satisfy Eq.(4). From the above it follows that the optimum conditions for the signal amplification are obtained if the quantity ξ changes in accordance with Eq.(5), which means that the average phase can be expressed by Eq.(4'). Solution of Eqs.(1) for the above conditions was carried out by means of a fast electronic computer. It was assumed that $\xi(\zeta)$ could be represented by Eq.(5') which is an expression much simpler than Eq.(5) though it issufficiently accurate. The results are shown graphically in Figs.1-9. Figs.1-3 illustrate the increase of the normalised power of the high frequency field $p(\zeta)$:

$$p(\zeta) = \frac{|F(\zeta)|^2}{2\varepsilon I_0 V_0} \qquad (6)$$

where I_0 and V_0 are the direct current and voltage component of the electron beam. The process of forming of the electron bunches is illustrated by Figs.5, 6 and 7, while the curve $\xi = \xi(\zeta)$ for the most important cases is illustrated by the curves of Figs.2 and 4. The dependence of the maximum power on parameters ξ_0 and α is shown in Figs.8 and 9. From the above it is concluded that the high frequency power of the tube can be increased by about 3 db. The author expresses his gratitude to P.S. Mikazan, O.A. Merkulova and V.M. Khapayeva for carrying out the calculations and to L.A. Vaynshteyn for valuable discussions. There

109-1-10/18

An Isochronous Travelling-Wave Tube.

are 9 figures and 5 references, 4 of which are English and 1 Russian.

SUBMITTED: November 29, 1956

AVAILABLE: Library of Congress

Card 5/5

FILIMONOV, G.F., kand.fiziko-matemat.nauk [translator]; TREBEVA, S.N., kand.tekhn.nauk [translator]; AYZIKS, Yu.D., inzh. [translator]; OVCHAROV, V.T., red.; AKALUNIN, S.A., red.; VORONIN, K.P., tekhn.red.

[Traveling-wave tube; translated articles] Lampa s begushchei volnoi; sbornik perevodnykh statei. Moskva, Gos.energ.izd-vo, 1959. 150 p. (MIRA 13:1)
(Traveling-wave tubes)

AUTHOR: Filimonov, G.F. SOV/109-4-1-11/30

TITLE: The Growth of Longitudinal Waves Propagating in Plasma (O roste prodol'nykh voln, rasprostranyayushchikhsya v plazme)

PERIODICAL: Radiotekhnika i Elektronika, 1959, Vol 4, Nr 1, pp 75 - 87 (USSR)

ABSTRACT: The aim of this article is to find a solution of the Vlasov equation, such as to permit the determination of the direction of the perturbations in plasma which are transported by each eigenwave. For the purpose of analysis, it is assumed that the plasma is infinite and the motion of the particles is uni-dimensional. The problem is formulated as follows. The electron plasma is formed of a mixture of n homogeneous electron beams, each of which has its distribution function $F_{jo} = F_{jo}(v)$ where $j = 1, 2, ...n$. At the instant $t = t_o$, a longitudinal external force $E_c(z, t)$ is applied to the plasma and this acts over an interval $z_1 \leqslant z \leqslant z_1 + L$. It is now necessary to find an expression for the complete longitudinal electrical field $E(z, t)$, which exists in the plasma after

Card1/6

the application of the external force. The function E_0 can be represented as the Fourier series, as expressed by Eq (1). The portion φ_j of the distribution function f_j of the electrons of the j-th ray can be written as Eq (2), provided the oscillations are comparatively small. The symbols v, e, m and ν_j in Eq (2) denote the velocity, the charge, the mass of an electron and the collision frequencies of the j-th ray with gas molecules. The complete electric field in plasma is equal to the sum of the external field E and the field of the particles E and is expressed by Eq (3) where E can be found from Eq (4). The boundary condition for Eqs (4) and (2) is expressed by Eq (5). Consequently, the complete field and the distribution function $\varphi(z, t)$ are expressed by Eqs (6) and (7) where $\mathcal{E}_k(t)$ is given by Eq (8), while $\mathcal{E}_k$ and E_{ok} are expressed by Eqs (9) and (10), respectively. Consequently, the solution of Eqs (2) and (4) is reduced to the solution of an integral of the Volterra type for the function $\mathcal{E}_k(t)$. Eq (8) can be solved by means of the Laplace transformation. The solution is/therefore written as:

$$\mathcal{E}_k(t) = \frac{1}{2\pi} \int_{iS-\infty}^{iS+\infty} d\omega \frac{E_{ok}(\omega)\, e^{-i\omega t}}{1 - g(\omega, k)} \qquad (11)$$

where:

$$E_{ok}(\omega) = \int_0^{\infty} E_{ok}(t) e^{i\omega t}\, dt; \quad g(\omega, k) = \int_0^{\infty} g_k(t) e^{i\omega t} dt \qquad (12) .$$

It is shown that provided the functions E_{ok} and g_k and all their derivatives are finite within the interval from 0 to $+\infty$, Eq (11) represents the unique solution of Eq (8); another condition of the uniqueness is that all the roots of the scattering equation $g(\omega,k) = 1$ should lie in the semi-plane $\mathrm{Im}\,\omega < S$. If the unperturbed distribution function of the system is of the rectangular type, as represented by Eqs (15), the solution of Eq (8) is in the form of Eq (16) where ω_ν are the roots of the scattering equation which, in this case, is in the form of Eq (17). If the perturbation is in the form of a δ function, the field excited in the plasma is represented by Eq (18). For the case of the Maxwell distribution, as expressed by Eq (21), the kernel of Eq (8) is given by Eq (22). Consequently, the scattering equation is represented by Eq (23). The indirect determination of the field for the case of the Maxwell distribution presents some difficulties. An attempt is made, therefore, to find an approximate value of the field $\mathcal{E}_{1k}$ which would be valid in the vicinity of the excitation region. The field can be written as the sum of a few terms of a series, such as represented by Eq (24). Eq (8) can, however, be applied to the solution of the problem of the propagation of plasma waves which are generated by a sinusoidal external force, having a frequency ω_0. In this case, $\xi(z, t)$ can be expressed by Eq (28) where the first term represents the stationary portion of the solution, while the second term is given by the sum of the eigenwaves which are excited in the plasma at the instant of the application of the external field. Contour C in Eq (28) does not coincide with the actual axis and should be chosen in such a way that in the semi-space $z < z_1$, only the waves having negative velocities would exist. For the semi-space $z_1 + L < z$ only the waves with positive velocities should exist. Approximately, Eq (28) can be written as Eq (29). From the above analysis, it is concluded that, though some of the criticisms expressed by Piddington (Ref 3) are justified, his assertion that the plasma system waves cannot be described by the scattering equation (see Eq 17) is incorrect. The author expresses his gratitude to

SOV/109-4-1-11/30

The Growth of Longitudinal Waves Propagating in Plasma

L.A. Vayrshteyn, G.Ya. Myakishev and M.Ye. Gertsenshteyn for valuable discussion and advice. There are 10 references, 1 of which is English and 9 Soviet; 2 of the Soviet references are translated from English.

SUBMITTED: June 3, 1957

Card 6/6

AUTHOR: G.F. Filimonov SOV/109- - -4-3-20/38

TITLE: Non-Linear Theory of a Two-Beam Electron Tube (Nelineynaya teoriya dvukhluchevoy elektronnoy lampy) Part I - Derivation and Analysis of the Equations (Ch. I - Vyvod i issledovaniye uravneniy)

PERIODICAL: Radiotekhnika i Elektronika, 1959, Vol 4, Nr 3, pp 489-499 (USSR)

ABSTRACT: The interaction of two single-velocity electron beams is considered. It is assumed that at the input of the tube the electrons of each beam have a certain drift velocity v_{ko}, a certain density and a given cross-sectional distribution. The thermal spread of the velocities and the effect of the electron collisions are neglected. The motion of the particles is undimensional (linear) and the velocities v_{ko} are positive. If the electron beam consists of N parts, the volume density of the electron current can be represented in the form of Eq (1). The alternating component of the longitudinal electric field due to the spatial distribution of the electrons can be found from Eq (5), where o represents the alternating component of the charge

Card 1/4

density. The electric field E_z can be written as Eq (6). The field components in Eq (6) can be found from Eq (7), whose solution is in the form of Eq (10). The average field acting on the electrons of the j-th ray is expressed by Eq (12) where S represents the effective cross-section while $D_{kj}(x)$ is a Green function which illustrates the interaction of the electrons of the k-th ray with the electrons of the j-th ray. In fact, $D_{kj}(x)$ is the scattering equation of the system and is the solution of the problem. $D_{kj}(x)$ is expressed by Eq (13). The component $d^{(2)}$ of D cannot easily be evaluated but for thick beams it can be approximated by Eq (14). For very fine beams D is given by Eq (15). The function D can be approximated by:

$$D^{(1)}_{kj}(x) = \frac{sh\left[p_k(\pi - x)\right]}{2\,sh\,p_k\,\pi} \qquad (17)$$

 provided the parameter p_k is properly chosen. The operation of a multi-beam electron tube in a non-linear

SOV/109- - -4-3-20/38

Non-Linear Theory of a Two-Beam Electron Tube. Part I. Derivation and Analysis of the Equations

regime can be described by Eq (20), where t_0 represents the input time of an electron in the tube, while t_j is the time of the appearance of the electrons of the j-th ray at a cross-section z. When the component E_0 is small, Eq (20) can be transformed into a system of ordinary linear equations with constant coefficients. The amplitude of the harmonics of the resulting electric field can be found from Eq (21). This shows that E_{kn} is in the form of a super-position of 2N eigenwaves, whose wave numbers k satisfy the scattering equation. For N = 2, Eq (23) has complex roots provided that the difference between the potential velocities of the interacting beams obeys the relationship given by Eq (24). By carrying out the normalising operations defined by Eq (25), Eq (20) can be written as Eq (26), while Eq (24) can be expressed as Eq (28). By integrating Eq (20) with respect to t_0, the conservation laws of the system are expressed by Eqs (29) and (30). The quantities

Card 3/4

SOV/109- - -4-3-20/38

Non-Linear Theory of a Two-Beam Electron Tube. Part I. Derivation and Analysis of the Equations

w, v and q in Eqs (29) and (3) are determined from Eq (31).

There are 9 references, 6 of which are Soviet and 3 English.

SUBMITTED: September 18, 1957

Card 4/4

22897
S/109/61/006/004/011/025
E140/E163

9,3130 (1163, 1532, 1538)

AUTHOR: Filimonov, G.F.

TITLE: The effects of two forms of longitudinal periodic modulation on the properties of single electron streams

PERIODICAL: Radiotekhnika i elektronika, Vol.6, No.4, 1961, pp. 593-603

TEXT: The author considers that previous studies on the stability of periodic beams, such as that of Rydbeck and Agdur (Ref. 1) as well as of certain Russian authors, have serious methodological defects, making it necessary to have a rigorous investigation of the applicability of their results. Furthermore, the literature does not discuss sufficiently the substantial differences in physical properties of electron streams with differing forms of periodic modulation. The author considers two groups of questions: the laws of conservation and the investigation of stability, using linearized equations, for one-dimensional single-beam electron streams, with strictly periodic modulation either in time or in space. The basic linearized equation is written in the Euler form: 4H

Card 1/ 3

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413030005-5"

22897

S/109/61/006/004/011/025
E140/E163

The effects of two forms of longitudinal periodic modulation on the properties of single electron streams

$$\left(\frac{\partial}{\partial t} + v_0 \frac{\partial}{\partial z}\right) j(z,t) - v_0 \left(\frac{\partial}{\partial t} + v_0 \frac{\partial}{\partial z}\right) \rho(z,t) = \rho_0 \frac{e}{m} E_{\parallel} \qquad (7)$$

and is valid for space-time regions where the velocity field is single-valued, continuous and differentiable. As these conditions are violated with mutual passing of electrons, the results are only valid in the absence of this behaviour. A formula is given to determine the limits of parameter variation in which mutual passing of electrons can be neglected:

$$t = t_0 + \frac{z}{v_{00}} + \frac{\alpha \sin \omega t_0 + \beta \sin(\omega t_0 + \varphi)}{\omega} \left(1 - \cos \frac{\omega_{00} z}{v_{00}}\right) - \frac{\alpha}{\omega_{00}} \cos \omega t_0 \sin \frac{\omega_{00} z}{v_{00}} \qquad (25)$$

Analysis shows that this occurs either for sufficiently dense electron beams or with low depths of velocity modulation.

Card 2/3

22897

S/109/61/006/004/011/025
E140/E163

The effects of two forms of longitudinal periodic modulation on the properties of single electron streams

With unstable oscillations a non-linear solution is required, taking into account second-order effects.
There are 8 references: 7 Soviet and 1 French.

SUBMITTED: June 29, 1960

Card 3/3

LAZAREV, A.V.; FILIMONOV, G.F.

Static characteristics of a plane magnetron. Radiotekh. i elektron 6 no.8:1316-1324 Ag '61. (MIRA 14:7)
(Magnetrons)

28527

S/109/61/006/009/010/018
D201/D302

9.4230

AUTHOR: Filimonov, G.F.

TITLE: Excitation of a delay line by a periodical sequence of ideally focussed electron bunches

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 9, 1961, 1508 - 1518

TEXT: The author studies theoretically the energy possibilities of the device in the form of a delay line at whose input there is a non-relativistic electron beam with periodically varying velocity and density. The basic equations of the non-linear theory of TWT can be presented as

$$-\frac{\partial^2 t}{\partial z^2} = \left(\frac{\partial t}{\partial z}\right)^3 \mathrm{Re}\, \frac{e}{m} E e^{-i\omega t}, \qquad (1)$$

$$\frac{d^2 E}{dz^2} + h_0^2 E = -i h_0 R_0 j, \qquad (2)$$

and

$$j = 2\int_0^T \frac{dt_0}{T} j_0(t_0)\, e^{i\omega t_0}, \qquad (3)$$

Card 1/9

28527

Excitation of a delay line ... S/109/61/006/009/010/018
D201/D302

where t_o is the instant of electro-injection into the tube, $z_1 t =$ $= t(z_1 t_o)$ its coordinate and time; e, m - change and mass of electron; E - the complex amplitude acting upon its field; h_o - the wave number of slow wave; R_o - coupling coefficients; T - period and $j_o(t_o)$ - the electron current at the input of the tube, taken usually to be constant, i.e. $j_o(t_o) = j_o$ = const, but in the actual case of the ideal focussing $j_o(t_o)$ is proportional to the o function

$$j_o(t_o = j_o \delta \left(\frac{t_o}{T}\right), \qquad (4)$$

in which $j_o = \int_0^T (dt_o/T) j_o(t_o)$ - the average over-one-period electron current. Changing to dimensionless quantities by assuming

Card 2/9

$$\omega t = \omega t_0 + h_0 z + w(\zeta), \quad z = \frac{v_0 \zeta}{\varepsilon \omega}, \quad h_0 = h_{00} = \frac{\omega}{v_0}(1 + \varepsilon \xi_0),$$
$$\varepsilon^3 = \frac{R_0 j_0}{4\left(\frac{\omega}{v_0}\right)^2 V_0}, \quad E = \frac{m}{e} v_0 \omega \varepsilon^2 f. \tag{5}$$

where v_0 electron velocity at the input of delay line; V_0 - their input potential; ε - small parameter and assuming further

$$f = F_+(\zeta)\, e^{ih_0 z} + F_-(\zeta)\, e^{-ih_0 z} \tag{6}$$

with additional condition

$$F_+'(\zeta)\, e^{ih_0 z} + F_-'(\xi)\, e^{-ih_0 z} = 0 \tag{7}$$

the following system of dimensionless equations is obtained

$$-w'' = (1 + \varepsilon \xi_0 + \varepsilon w')^3 \operatorname{Re}\left(F_+ e^{ih_0 z} + F_- e^{-ih_0 z}\right) e^{-i\omega t}, \tag{8}$$

$$F_\pm' = \mp 2 e^{i(h_0 z \mp h_0 z + w)}. \tag{9}$$

ιX

which describe non-linear processes in a TWT excited by a periodical sequence of ideally focused electron bunches. The dash denotes differentiation with respect to ξ. By approximate integration of F_- from Eq. (9)

$$\operatorname{Re} F_- e^{-ih_0 z - i\omega t} \simeq \operatorname{Re} d e^{-2ih_0 z - iw} \frac{\varepsilon^3 w''}{8}. \tag{10}$$

can be obtained, where d - an integration constant. It may be seen from Eq. (8) that the backward wave F_- produces small oscillations only of the solution and can be in effect neglected.

$$\varepsilon w'_\xi = (1 - \eta)^{1/2} - 1 - \varepsilon\xi_0, \tag{13}$$

$$\varphi' A = \pm \sqrt{4 - A'^2}, \tag{14}$$

$$\varepsilon\varphi' = (1 + \sqrt{1 - \eta})^{-1} - \frac{1 + \varepsilon\xi_0}{2} \tag{15}$$

are then obtained which constitute the required solution of the X

28527

Excitation of a delay line ... S/109/61/006/009/010/018
D201/D302

problem as well as

$$\frac{\varphi'}{/\varphi'/}\sqrt{\frac{2\varepsilon^3}{\eta}} - \frac{1}{1+\sqrt{1-\eta}} - \frac{1+\varepsilon\xi_0}{2} \tag{16}$$

which represents (for given ε, ξ_0) the maximum efficiency of the device. Eq. (16) can be easily solved by substituting $\eta = \sin^2\psi$ ($0 \leqslant \psi \leqslant 90°$). The dependence of $\eta = \eta(\xi_0)$ for $D \geqslant 0$ is then analyzed, and it shows that between all possible values of ξ_0 there is a set of values for which the interaction between the electrons and the slow wave is the greatest so that the efficiency reaches its maximum. Table 1 gives the numberical values of η for different ε and ξ_0. The upper limit of the region of instability of TWT with a homogeneous beam at the input is

$$\xi_0 \cong 3/4^{1/3}$$

and is lower than that for the tube described in this article. The optimum length of the tube $\xi = \xi_m$ for which η reaches its maximum

Card 5/9

is determined from

$$\eta' = \pm\sqrt{8\varepsilon\eta - \eta^2\left(\frac{1}{\varepsilon}\frac{1-\sqrt{1-\eta}}{1+\sqrt{1-\eta}} - \xi_0\right)^2}, \tag{29}$$

ξ_m is expressed by linear combination of full elliptical integrals of the first and third kind

$$\zeta_m = L\int_0^{\pi/2}\left[1 - \frac{2\varepsilon}{1+\varepsilon\xi_0}\left(\alpha_1 + \frac{\beta_1-\alpha_1}{1-\frac{\beta_1^2}{\alpha_1^2}\cos^2\varphi}\right)\right]\frac{d\varphi}{\sqrt{1-\frac{k}{1+k}\sin^2\varphi}}, \tag{30}$$

where

$$L = \frac{2(\beta_1-\alpha_1)}{\sqrt{\alpha_1\left(\alpha_1 - u\frac{1+\varepsilon\xi_0}{2}\right)\left[\beta_1^2+\beta_1\left(\frac{1+\varepsilon\xi_0}{2}u-2\xi_0\right)+4u^{-1}\right](1+k)}};$$

$$k = \frac{\beta_1^2}{\alpha_1^2}\,\frac{\alpha_1^2+\alpha_1\left(\frac{1+\varepsilon\xi_0}{2}u-2\xi_0\right)+4u^{-1}}{\beta_1^2+\beta_1\left(\frac{1+\varepsilon\xi_0}{2}u-2\xi_0\right)+4u^{-1}}; \quad u = \frac{2\left(v+\varepsilon\frac{\sqrt{2}}{3}\right)^2}{1+\varepsilon\left(v+\varepsilon\frac{\sqrt{2}}{3}\right)^2};$$

$$\beta_1 = -\alpha_1 - \frac{4u^{-1}}{\frac{1+\varepsilon\xi_0}{2}u - \xi_0} =$$

$$= \sqrt{\left(\frac{2u^{-1}}{\frac{1+\varepsilon\xi_0}{2}u-\xi_0}\right)^2 + \frac{1+\varepsilon\xi_0}{\frac{1+\varepsilon\xi_0}{2}u-\xi_0}} - \frac{2u^{-1}}{\frac{1+\varepsilon\xi_0}{2}u-\xi_0};$$

Since no tables of full elliptical integrals of the third kind are available in literature, these integrals in Eq. (30) have to be computed in approximation in series with retention of the two first terms. The results obtained show that the effective length of the device is approximately 3 times less than that of an ordinary TWT. Fig. 1 shows the graph of η as a function of ε for $\xi_0 = 0$ in the isochronous (curves 1, 2) state, while the graph of $\eta = \eta(\varepsilon)$ corresponding to the non-isochronous state ($q_k = 0$) with $\xi_0 = 0$ is shown by curve 3 and with $\xi_0 = 3.2^{-1/3}$ by curve 4. Their comparison shows that the introduction of isochronism gives a larger tube efficiency for a given value of ξ_0, but also that the limit efficiency of a homogeneous tube ($q_k = 0\ \xi_0 = 3.2^{-1/3}$) is lower than the optimum efficiency of isochronous tubes ($\xi_0 = 0$) only for $\varepsilon \lesssim 0.05$. There are 2 figures, 2 tables and 7 Soviet-bloc references.

SUBMITTED: November 19, 1960

Table 1. Values of η as a function of ξ_0 and ε.

~~Значения~~ η ~~в зависимости от~~ ξ_0 ~~и~~ and ε

ξ_0	ε				
	$\varepsilon \to 0$	0,05	0,1	0,15	0,2
0	5,04 ε	0,21	0,36	0,48	0,58
0,75	7,21 ε	0,31	0,54	0,70	0,82
$3/4^{1/3}$	11,0 ε	0,44	0,70	0,86	0,95
$3/2^{1/3}$	12,7 ε	0,48	0,76	0,90	0,98
$4/2^{1/3}$	0,9233 ε	0,046	0,093	0,140	0,188

S/109/62/007/005/020/021
D230/D308

9.4210

AUTHORS: ~~Filimonov, G.F.,~~ and Lazarev, A.V.

TITLE: Static regime of a cylindrical magnetron

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 5, 1962, 911 - 916

TEXT: Formulas are deduced for the cloud density of the spatial charge n(r), its temperature T(r), tangential current $j_{\varphi}(r)$ and electron current flowing towards the anode $j_r(r)$. The electron cloud is assumed to be formed by the electrons leaving the cathode with a certain velocity distribution f(v), moving in a constant electric and magnetic field, and finally reaching the magnetron anode or its cathode. In the direction Oz the magnetron is considered infinite. The present method of deduction is new as compared with the authors' previous method (Radiotekhnika i elektronika, v. 6, no. 8, 1961, 1316), moreover, the results have a much wider application. The region of variation of initial velocities of electrons which corresponds to the electrons passing a point with a given r from cathode to anode, is of fundamental importance for the solution of the inte-

Card 1/2

S/109/62/007/005/020/021
Static regime of a cylindrical magnetron D230/D308

grals defining the characteristics and is treated in detail. Graphs of calculated results of anode current versus magnetic field are compared with those obtained experimentally for a magnetron having a plane anode. The agreement is good except for the case of small currents; the difference is in this case explained by supplementary electron sources in the interaction space whose distribution function depends on the energy of 'produced' electrons less strongly than the one assumed in the text. There are 2 figures.

SUBMITTED: July 8, 1961

Card 2/2

16.6500
24 4100

38084

S/040/62/026/003/007/020
D407/D301

AUTHOR: Filimonov, G.F. (Moscow)

TITLE: Calculation and study of particular solutions of the generalized Hill equation

PERIODICAL: Prikladnaya matematika i mekhanika, v. 26, no. 3, 1962, 455 - 465

TEXT: By solving directly an infinite system of linear algebraic equations, the author obtains series and estimates for the Fourier coefficients of the particular solutions of the generalized Hill's equation, as well as the convergence criteria. The generalized Hill's equation is

$$\frac{d^2}{d\tau^2} y(\tau) + \Psi(\tau) y(\tau) = 0, \quad \Psi(\tau) = \sum_{m=-\infty}^{\infty} \theta_m \cos(2m\tau + e_m) \qquad (1.1)$$

The series solutions $y_k(\tau)$ are calculated by the method of successive approximations from the infinite system of algebraic equations, to which (1.1) reduces. For calculating $y_k(\tau)$, one proceeds from one

Card 1/4

of the following expressions:

$$y_k(\tau) = e^{\mu_k \tau} \Phi_k(\tau) \quad (k = 1, 2) \qquad (2.1)$$

or $y_1(\tau) = \Phi_1(\tau)\cos \nu\tau - \Phi_2(\tau)\sin \nu\tau$, $y_2(\tau) = \Phi_1(\tau)\sin \nu\tau + \Phi_2(\tau)\cos \nu\tau$, (2.2)

(where $i\nu = \mu$), or

$$\Phi_k(\tau) = C_k + \sum_{q=-\infty}^{\infty} \Delta(q, -n/2)\,[c_{kq}\sin(n+2q)\tau + s_{kq}\cos(n+2q)\tau] \qquad (2.4)$$

$$(c_{kq} = A_{kq}\cos\varphi_{kq},\ s_{kq} = A_{kq}\sin\varphi_{kq})$$

By combining (2.4) with (2.1) or (2.2), it is possible to obtain various expressions for $y_k(\tau)$. To each of them corresponds its infinite system of algebraic equations. Two such systems are obtained. Absolute convergence criteria for the series solutions of these systems are derived. The proposed methods of calculating $y_k(\tau)$ are similar to Whittaker's method (Ref. 1: E.T. Whittaker, G.N. Watson, A course in Modern Analysis (Russian translation, GITTL, 1934)). The solution (2.2), (2.4) is particularly important. It contains, in closed form, the characteristic equation and permits of independent calculation of the characteristic value ν and of the Fourier coefficients c_{kq} and s_{kq}. The characteristic equation contains only one unknown (ν). Approximate formulas are derived for the roots ν of this equation. Further, $y_k(\tau)$ is calculated by means of (2.1), (2.4) instead of (2.2), (2.4). Approximate expressions are obtained for A_q and φ_q (i.e. the amplitude and phase). Further, the solution of the ordinary Hill's equation is considered ($\varepsilon_m = 0$ in Eq. (1.1)). Thereby the use of the above series-solutions yields final expressions for the amplitudes A_q. Mathieu's equation is considered, which is a particular case of the ordinary Hill's equation. Yet the above methods of calculating $y_k(\tau)$ are not always suitable for the Mathieu equation; therefore Whittaker series are used, which have faster convergence. In conclusion, simple- series-solutions were obtained for the generalized Hill's equation, which can be directly used in practice. Formulas are derived for estimating the accuracy of the method of successive approximations, as well as inequalities for esti-

S/040/62/026/003/007/020
D407/D301

Calculation and study of particular ...

mating the truncation error.

SUBMITTED: February 23, 1960

Card 4/4

FILIMONOV, G.F.

Excitation of a delay line by a periodic sequence of extended electron clots. Radiotekh. i elektron. 8 no.10:1706-1714 O '63. (MIRA 16:10)

L 10467-67 EWT(1)

ACC NR: AP603 021 SOURCE CODE: UR/0109/66/011/009/1571/1578

AUTHOR: Badlevskiy, Yu. N.; Ovcharov, V. T.; Filimonov, G. F. 20

ORG: none

TITLE: Maximum values of electronic efficiency of TW tubes 25 and their dependence on nondimensional and dimensional tube parameters

SOURCE: Radiotekhnika i elektronika, v. 11, no. 9, 1966, 1571-1578

TOPIC TAGS: TW tube, electron tube, shf tube, electronic engineering

ABSTRACT: Based on many numerical solutions of TW-tube numerical equations, maximum efficiencies of single-section, two-section, and absorbing-insert continuous-beam types are evaluated, compared, and the factors which influence the efficiency are found out. Particular attention is paid to the single-section type because several authors have indicated that this type has the highest efficiency

Card 1/2 UDC: 621.385.632

L 10467-67

ACC NR: AP6031021

0

(e.g., see A. W. Scott, IRE Trans., ED-9, 1962, 1, 35; and C. K. Birdsall et al., IRE Trans., ED-6, 1959, 1, 6). It is found that: (1) With practical values of space-charge density and space-charge range parameters and optimal values of all other parameters, the above three types have approximately equal maximum efficiencies; optimal efficiency lies within 45—48%; (2) With a fixed value of coupling resistance, the TW-tube efficiency increases with the tube output; to increase the efficiency, with a fixed output, the coupling resistance and accelerating voltage should be increased and the microperveance decreased. Orig. art. has: 7 figures and 9 formulas.

SUB CODE: 09 / SUBM DATE: 08May65 / ORIG REF: 004 / OTH REF: 005

Card 2/2 egk

L 23266-66 EWT(1)/EWA(h) IJP(c) AT

ACC NR: AP6007072

UR/0057/66/036/002/0250/0257

AUTHOR: Galaktionov, S.V.; Filimonov, G.F.

ORG: none

TITLE: Influence of backward radiation on the amplification of signals in a weakly modulated one-dimensional electron beam

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 2, 1966, 250-257

TOPIC TAGS: traveling wave amplifier, traveling wave interaction, electron beam, backward wave amplifier,

ABSTRACT: The authors discuss the theory of the traveling wave amplifier with particular reference to the influence of backward traveling waves. The treatment is based on linearized equations previously given by L.A. Vaynshteyn (Radiotekhnika i elektronika, 2, No. 7, 883, 1957). It is shown that a backward wave is always present and, although the maximum amplitude of the backward wave is always small compared with that of the forward wave, the presence of the backward wave limits the increase of the useful gain that can be achieved by increasing the length of the electron beam. The saturation of the useful gain (as a function of the beam length) is not due to redistribution of energy between the forward and backward waves; it is suggested that the saturation is due to the fact that useful gain takes place only in the terminal

Card 1/2

UDC: 538.566

L 23266-66

ACC NR: AP6007072

portion of the beam where the amplitude of the backward wave is still small. Results of numerical calculations are presented graphically and are discussed. The authors thank V.T.Ocharov for discussions and valuable advice. Orig. art. has: 13 formulas and 6 figures.

SUB CODE: 09 SUBM DATE: 10May65 ORIG. REF: 006 OTH REF: 000

Card 2/2 VLR

FILIMONOV, G.V.

Late results of subfascial subtotal resection of the thyroid gland in thyrotoxicosis. Klin.khir. no.5:61-64 My '62. (MIRA 16:4)

1. Kafedra khirurgii (zav. - zasluzhennyy deyatel' nauki, prof. G.M.Gurovich) Khar'kovskogo meditsinskogo stomatologicheskogo instituta.

(THYROID GLAND—SURGERY)

ACCESSION NR: AT4038451 S/2563/63/000/229/0101/0105

AUTHOR: Shchipkov, M. D.; Filimonov, G. Ya.

TITLE: A study of the tendency toward intergranular corrosion in spot welded joints

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy*, no. 229, 1963, Svarochnoye proizvodstvo (Welding production), 101-105

TOPIC TAGS: steel, steel OKh18N9, spot welding, steel corrosion, intergranular corrosion, weld joint corrosion, anodic pickling, austenitic steel

ABSTRACT: Generally, austenitic steel of the 18-8 type is stable under the influence of the atmosphere or various acids. However, under certain conditions, this steel exhibits a tendency toward intergranular corrosion, the intensity of which depends upon the crystalline structure of the metal. In the experiments described in the present paper, spot-welded (8,000 or 16,000 amps. for 0.16 or 0.4 seconds) joints of OKh18N9 steel were tested for resistance to intergranular corrosion by the standard method described in GOST 6032-58, involving anodic pickling in an electrolyte of 60% sulfuric acid plus 0.1% urotropine. Welded specimens were subjected to rupture strength tests and visual examination of their structure either in

Card 1/2

ACCESSION NR: AT4038451

the as-welded condition, after annealing at 700 C (2-3 hrs.), or after austenitization by quenching in water from 1150 C. On the basis of the results obtained, it is concluded that electrical resistance spot-welding noticeably decreases the resistance of OKh18N9 steel to intergranular corrosion; the severest corrosion occurs in the base-metal region adjacent to the welded spot. In the as-welded condition, the fused metal of the spot has a considerably lower resistance to intergranular corrosion than the base-metal adjacent to the spot; development of corrosion occurs uniformly in both the peripheral and central regions of the spot. After sensitizing annealing of spot-welded joints in the critical range of temperatures (650-700 C) for 2 hours, cracks may develop in the base-metal starting from the fused zone boundary under the influence of a corrosive medium. These cracks appear as the result of "knifeline attack" and are of the ramifying type. Austenitization of OKh18N9 steel by quenching in water from 1150 C considerably increases the resistance of the weld spot to intergranular corrosion. Orig. art. has: 5 figures and 2 tables.

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. M. I. Kalinina (Leningrad Polytechnical Institute)

SUBMITTED: 00 DATE ACQ: 12Jun64 ENCL: 00

SUB CODE: MM NO REF SOV: 003 OTHER: 000

Card 2/2

YEFIMOV, L.A.; FILIMONOV, G.Ya.

Selection of electrrdes for the arc welding of thin dissimilar steels. Trudy LPI no.229:96-100 '63. (MIRA 17:9)

SHCHIPKOV, M.D.; FILIMONOV, G.Ya.

Investigating the tendency toward intercrystalline corrosion of spot welds. Trudy LPI no.229:101-105 '63. (MIRA 17:9) [illegible] /EWP(w)/ [illegible] /EWP(v)/ [illegible] /EWP(k)/ [illegible]

[illegible]

AUTHOR: Shchipkov, M. D.; Filimonov, G. Ya.

TITLE: The influence of the basic parameters of ultrasonic welding on the [illegible] and properties of copper and nickel junctions

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy, no. 245, 1965. Svarochnoye proizvodstvo (Welding production), 80-86

TOPIC TAGS: ultrasonic welding, point welding, copper welding, nickel welding, welding pressure, welding time

ABSTRACT: Published studies on ultrasonic point welding of metals (see, e.g., L. [illegible] F. Balandan, M. G. Kogan, Ul'trazvukovaya svarka, M., Mashgiz, [illegible] 251, N. A. Ol'shanskiy, Avtomaticheskaya svarka, 1961, no. 3, p. [illegible] the size [illegible] the heating temperature [illegible] of the metal depend on the amplitude and [illegible] pressure, and the duration of welding. The present authors investigated the influence of the contact pressure and the welding time on the mechanical properties and structure of the metal of point junctions between deformed and

Card 1/2

ACCESSION NR: AT5014465

copper 0.2-0.28 mm thick and deformed nickel 0.12 mm thick. The welding was carried out on the UZSA-1 machine whose magnetostriction converter was fed ... 000-21,000 cps 16-18 μ amplitude oscillations by the UZM-10 generator. ... welds exhibit good properties ... comparable ...

FILIMONOV, I., geroy Sotsialisticheskogo Truda.

Cultural demands of miners are growing. Mast.ugl. 3 no.5:23 My '54.
(MLRA 7:6)

1. Mashinist kombayna shakhty No.1 kombinata Moskvougol'.
(Coal miners)

KORNILOV, I.; FILIMONOV, I.

Antiaircraft defense propaganda by visual means. Voen.znan. 35 no.1:32 Ja '59. (MIRA 12:5)
(Kharkov--Air defenses)

FILIMONOV, I., ofitser zapasa (Belaya TSerkov' Kiyevskoy obl.)

Special attention to rural collectives. Voen. znan. 41 no.9:29-30 S '65. (MIRA 18:10)