L 27597-65   EWT(l)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EWA(m)-2   Pz-6/Po-4/Pab-10/Pi-4
IJP(c)   AT

ACCESSION NR: AP5003237   S/0057/65/035/001/0056/0061

AUTHOR: Zykov,V.G./ Stepanenko,I.A./ Dushin,L.A./ Nikol'skiy,I.K./ Pavlichenko, O.S./ Tolok, V.T.

TITLE: Spectroscopic investigation of the plasma in colliding bursts

TOPIC TAGS: plasma interaction, plasma spectral line, charge exchange

ABSTRACT: This paper reports a continuation of work by some of the present authors and others (ZhTF 35,62,1965 /see Abstract AP5003238/) concerning the confinement of plasma injected into a cusp magnetic field. The present work was performed without the magnetic field, and was undertaken to investigate the processes taking place in colliding plasma bursts. Plasma bursts were injected from one or more of four coni-

Card 1/3

L 27597-65

ACCESSION NR: AP5003237   3

of 2×10^{14} cm^{-3} and the electron temperature was 4 to 4.5 eV. The velocity of the fast component of a bursts was 1.4×10^7 cm/sec; this was followed by a slower "tail". The collision of two plasma bursts led to an increase in the intensity of all spectrum lines and the appearance of lines that were not observed in single bursts. Velocity measurements performed with the photoelectric instrument using the H$_\beta$ 4861, C I 4371 and C II 4267 lines showed that both the carbon ions and the hy-

work: Originaluitud, u uiguiutu

L 27597-65

ACCESSION NR: AP5003237

ASSOCIATION: none

SUBMITTED: 13Feb64   ENCL: 00   SUB CODE: ME,OP

NR REF SOV: 002   OTHER: 001

O

L 27602-65   EWT(1)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EWA(m)-2   Pz-6/Po-4/Pab-10/P1-4
IJP(c)   AT

ACCESSION NR: AP5003238   S/0057/65/035/001/0062/0071

AUTHOR: Zykov, V.G./ Stepanenko,I.A./ Tolok, V.T./ Sinel'nikov, K.D,

TITLE: Investigation of the capture of plasma in a magnetic trap with opposing fields

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.1, 1965, 62-71

TOPIC TAGS: plasma confinement, magnetic mirror, cusp field, plasma interaction

ABSTRACT: The authors have investigated the confinement of plasma by a three-cusp magnetic field produced in a 20 cm diameter stainless steel cylinder by four windings disposed as shown in Enclosure 01. The maximum magnetic field at the wall of the chamber in the cusps was 1200 Oe. Hydrogen plasma was injected at one or more of the cusps by four conical plasma guns equally spaced about the periphery. The

Card 1/3

L 27602-65

ACCESSION NR: AP5003238

central cusp the magnetic field did not tend to confine it to this region. The mag-
netic field did, however, tend to confine to the central region plasma that was in-
jected at one of the side cusps (e.g. Z_2), and this tendency was markedly increased
(the decay time increased from 30 to 55 microsec) when plasma was injected at both
side cusps (Z_2 and Z_{-2}) simultaneously. This behavior is

ASSOCIATION: Fizichesko-tekhnicheskiy institut AN UkrSSR,Khar'kov (Physicotechnical Institute, AN UkrSSR)

SUBMITTED: 13Jan64

ENCL: 01

SUB CODE: ME

NR REF SOV: 004

OTHER: 002

Card 2/3

L 27602-65

ACCESSION NR: AP5003238

ENCLOSURE: 01

$$z_2 \; z_1 \; z_0 \; z_1 \; z_3$$

Diagram of the apparatus: 1 - windings, 2 - plasma guns,
3 - double electric probe, 4 - magnetic probe.

Card 3/3

DYR , V.O.; SILFACHENKO , L.A.; MUSHIN, L.A.; NIKOLSKIY, I.K.;
      PAVLICHENKO, O.S.; TOLOK, V.T.

Spectroscopic study of plasma clots in collision. Zhur. tekh.
fiz. 35 no.1:56-61 Ja '65.   (MIRA 18:3)

L 2491-66   EWT(1)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2   IJP(c)   AT

ACCESSION NR: AP5020723   UR/0057/65/035/008/1390/1393

AUTHOR: Zykov, V.G.; Stepanenko, I.A.; Tolok, V. T.

TITLE: Interaction of polarized plasma streams in a magnetic field that increases toward the periphery

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 8, 1965, 1390-1393

TOPIC TAGS: turbulent plasma, plasma confinement, plasma injection, plasma interaction, magnetic trap, magnetic mirror, cusped magnetic field

ABSTRACT: The authors and collaborators have previously investigated the interaction of oppositely directed plasma streams in a uniform transverse magnetic field (ZhTF, 32, 1050, 1962). The oppositely polarized plasmas interacted strongly and deceleration occured; turbulence arose, however, which led to loss of plasma. In the present paper the authors report experiments with oppositely directed plasmas in a biconical cusped field, which were undertaken with the expectation that the more smoothly varying field would not give rise to turbulence. The biconical cusp was produced in a 30 cm diameter stainless steel chamber by the discharge with a 19 µsec period of a 2700 µfd capacitor through appropriate windings. The maximum

Card 1/2

L 2491-66
ACCESSTION NR: AP5020723   3

field strength in the mirror region was 8800 Oe, and in the cusp at the chamber
wall, 2250 Oe. Plasmas were injected from one, two, or four conical guns symmetri-
cally disposed with respect to the plane of the cusp in a meridian plane of the
biconical field. The injection directions were at 45° to the axis of the field.
Each plasma gun was fired by the 12-15 kV discharge of a 1.2 μfd capacitor, the
discharge period being 3.5 μsec. The behavior of the plasmas was observed by pho-
tographing their luminescence from different directions, and the plasma polariza-
tion at different points was measured with a double floating probe. The plasma
polarization did not vanish when the plasma crossed the central point of zero mag-
netic field; it disappeared only after the plasma had penetrated several centi-
meters beyond this point into the region of oppositely directed field. The oppo-
sitely directed plasmas did strongly interact without observable turbulence, but
part of the plasma escaped through the cusp, and part escaped through the mirrors.
"In conclusion, we express our deep gratitude to Academician K.D.Sinel'nikov for
his valuable advice and interest in the work." Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 16Nov64   ENCL: 00   SUB CODE: ME

NR REF SOV: 003   OTHER: 000
Card 2/2

L 3614-66 EWT(1)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT
ACCESSION NR: AP5024033   UR/0057/65/035/009/1585/1589
                                                 533.9

AUTHOR: Zykov, V. G.; Stepanenko, I. A.; Tolok, V. T.

TITLE: Polarization interaction of opposed plasma streams in a composite magnetic field trap

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 9, 1965, 1585-1589

TOPIC TAGS: magnetic mirror, combined magnetic field, plasma injection, plasma jet, plasma confinement, plasma interaction

ABSTRACT: The authors have investigated the behavior of plasma bursts colliding within a·magnetic mirror system provided with an auxiliary quadrupole or octupole magnetic field. The magnetic mirror system was produced in a 30 cm diameter stainless steel chamber by discharge·of a 2700 microfarad capacitor through suitable windings. The maximum magnetic field at the center of the system was 2800 Oe and the mirror ratio was 2.16. The auxiliary field was provided by currents in eight copper rods parallel to the main field and disposed at equal intervals on the surface of a 10.6 cm diameter cylinder. The rods could be connected variously in series or series-parallel, but the rod system was always connected in series with the main windings so that the ratio of the auxiliary to the main field remained constant during the discharge. At the surface of the 1 cm diameter rods this ratio
Card 1/2

L 3614-66

ACCESSION NR: AP5024033

was 0.87. Plasma bursts from four conical plasma guns disposed symmetrically in the equatorial plane of the mirror system were injected transversely to the main magnetic field. The velocity of the leading edge of a plasma jet was 2×10^6 cm/sec and the ion density was of the order of 10^{13} cm^{-3}. In the presence of the auxiliary magnetic field the turbulent plasma "protuberances" observed earlier by the authors and collaborators (ZhTF, 34, 1417, 1964) did not occur, and there was no difficulty in assuring head on collision between oppositely directed jets. It was established with the aid of probes that the oppositely polarized colliding jets interacted strongly. The maximum plasma density in the center of the system was much greater when the auxiliary field was present than when it was not, but the confinement time was the same in both cases. "The authors express their sincere gratitude to Academician K.D.Sinel'nikov for his valuable advice and support of the work." Orig. art has: 4 figures. *44,55*

ASSOCIATION: none

SUBMITTED: 16Nov64   ENCL: 00   SUB CODE: ME

NO REF SOV: 004   OTHER: 000

Card 2/2

ACC NR: AP6036030   SOURCE CODE: UR/0057/66/036/011/1971/1975

AUTHOR: Zykov,V.G.; Stepanenko,I.A.; Tolok,V.T.

ORG: none

TITLE: Volume polarization interaction of plasmas in a multipole magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 11, 1966, 1971-1975

TOPIC TAGS: plasma injection, dense plasma, plasma gun, plasma interaction, non-homogeneous magnetic field, combined magnetic field, magnetic trap

ABSTRACT: The authors have investigated the behavior of plasma bursts with velocities of 2×10^6 cm sec and densities of 10^{12} to 10^{13} cm^{-3} produced by conical plasma guns and transversely injected singly or simultaneously in opposite directions into the magnetic field produced by the inductively loaded 3 kV discharge of a 2.7 millifarad capacitor bank through four parallel 1 cm diameter 150 cm long brass rods, which formed the edges of a rectangular parallelepipedon with a cross section diagonal of 10.5 cm. The period of the loaded discharge was 4 millisec and the maximum strength of the magnetic field produced on the injection axis by the currents in the rods, all four of which1 were in the same direction, was 1.2 kOe. The injected plasmas were photographed and their behavior was investigated with electric and magnetic probes. It was found that a plasma burst of considerable density would pass through both magnetic barriers. From this it is concluded that simultaneous injection from

Card 1/2

ACC NR: AP6036030

opposite directions is necessary for efficient entrapment of plasma. The magnetic
field configuration recorded with simultaneous injection of plasmas from opposite
directions differed considerably from the algebraic sum of the fields recorded with
single injection of plasmas from the two directions; this shows that the colliding
plasmas interacted with each other. The moving plasmas were electrically polarized.
The polarization of a singly injected plasma changed sign, but the polarization passed
through zero not on the axis of the system, but some 0.5 cm beyond the axis in the
direction of motion of the plasma. When two plasmas were simultaneously injected in
opposite directions their polarizations decreased smoothly and vanished on the axis
of the system. Plasma was entrapped in the field when; two plasmas were simultaneously
injected; the entrapped plasma moved both along the magnetic lines of force and
parallel to the axis of the system. It is planned to investigate injection of plasmas
parallel to the axis of the system and entrapment of interacting plasmas in magnetic
traps. The authors thank graduate student A.V.Pashchenko of the MIFI for partici-
pating in the measurements. Orig. art. has: 7 figures.

SUB CODE: 20   SUBM DATE: 22Jul65   ORIG. REF: 001   OTH REF: 002

Card 2/2

TSVETKOV, V.N.; SKAZKA, V.S.; NIKITIN, N.A.; STEPANENKO, I.B.

Sedimentation and diffusion of polymer solutions studied by
means of a polarization interferometer. Vysokom. soed. 6
no.1:69-75 Ja'64.   (MIRA 17:5)

1. Fizicheskiy institut Leningradskogo gosudarstvennogo
universiteta.

STEPANENKO, I.D.

Investigating the process of first carbonation in the spray absorber
and the new method for feeding carbon dioxide gas. Sakh. prom. 31
no.4:59-66 Ap '57.   (MIRA 10:6)

1. Cherkasskiy sakhsveklotrest.
          (Sugar industry--Equipment and supplies)

STEPANENKO, I. D., Cand Tech Sci --- (diss) "Study of the process of first

saturation in an irrigation absorber." Kiev, 1958.   13 pp ; 1 sheet of

drawings (Min of Higher Education Ukr SSR, Kiev Technological Inst of

Food Industry), 150 copies (KL, 18-58, 100)

-70-

STEPANENKO, I.D.; MILIRUD, B.T.; PARKHOD'KO, A.P.

Using new methods in organizing the repairing and remodeling of sugar factories. Sakh.prom. 33 no.6:45-48 Je '59.

(MIRA 12:8)

1. Cherkasskiy sakhsveklotrest.
        (Sugar industry--Equipment and supplies)

STE: : MNKO, 1. F.

The Siberian butter industry Novosibirsk Sibkraizdat, 1928. 201 p.

Yudin HD92 76.S83

........., I.F.

........., I. F. "The substitution of whole milk by skim milk in the form of
acidophilin in feeding calves", Trudy Lne. robotr. s.-kh. in-ta, cl. II-III,
1948, p. 95 -149 - Biblio: 6 items

SO: U-3461, 10 April 53, (Letopis'zhurnal 'nykh Statey, No. 16, 1949

31.12 . . .

Stepanov, L. I. "Interrelation of chemical change in the process of maturing
soil change, in relate readability", Trudy Lesprom... a. R. . 1-4, Vol. 1-11,
1947, s. 191-21, - Bibliog: 15 items.

So: L-201, 1 April 5, (Letopis 'Zhurnal 'nykh Statey, No. 15, 1949).

STEPANENKO, I.G.,inzh.

Using precast reinforced concrete in constructing shops of
chemical plants. Prom.stroi. 37 no.3:9-12 Mr '59.
(MIRA 12:4)

(Chemical plants)   (Precast concrete construction)

STEPANENKO, L.I.; BYKOV, G.D.; SOSIPATROV, V.T.; TAT'YANSHCHIKOV, A.G.

Rapid top pouring of steel. Metallurg 10 no.8:18-20 Ag '65.
(MIRA 18:8)

1. Cherepovetskiy metallurgicheskiy zavod.

STEPANENKO, I.A.

Titration of pyridine. Izv.vys.ucheb.zav.;khim.i khim.tekh. 4
no.3:513-514 '61.   (MIRA 14:10)

1. Moskovskoye vyssheye tekhnicheskoye uchilishche imeni
Baumana, kafedra obshchey khimii.
(Pyridine)

ENGLIS, Kronid Eduardovich; STEPANENKO, Igor' Pavlovich;
    LOGVINENKO, A.I., red.

    [Electronic amplifiers] Elektronnye usiliteli. Izd.2.,
    ispr. i dop. Moskva, Nauka, 1964. 539 p.
                                        (MIRA 17:10)

STEPANENKO, I.P., kandidat tekhnicheskikh nauk, redaktor; SHAMSHUR, V.I.,
    redaktor; FRIDKIN, A.M., tekhnicheskiy redaktor.

[Some problems in applied electronics; a collection of scientific
papers by students of the Moscow Physical Engineering Institute]
Nekotorye voprosy prikladnoi elektroniki;sbornik nauchnykh rabot
studentov MIFI. Pod red. I.P.Stepanenko. Moskva, Gos. energ. izd-
vo, 1955. 87 p.   (MLRA 9:4)

1.Moscow. Moskovskiy inzhenerno-fizicheskiy institut.
                        (Electronics)

STEPANENKO, I.P.

Calculating limiting cascades. Sbor.nauch.rab. MIFI no.9:68-74 '55.

(MIRA 10:1)

(Pulse techniques (Electronics)

STEPANENKO, I.P.

Some problems in transmitting pulse tops in electronic amplifiers.
Sbor.nauch.rab. MIFI no.9:92-101 '55.   (MIRA 10:1)
   (Amplifiers, Electron-tube)(Pulse techniques(Electronics))

AGAKHANYAN, T.; STEPANENKO, I.

An electronic encephalograph. Radio no.12:53-56 D '55.(MLRA 9:4)
(Electroencephalography)(Electronic apparatus and appliances)

STEPANENKO, I. P.

471

COINCIDENCE STUDY OF Tb[160] RADIATION. I. P. Stepanenko and L. Ya. Shavtvalov. Izvest. Akad. Nauk S.S.S.R. Ser. Fiz. 19, 318-23(1955) May—June. (In Russian). A circuit diagram of the linear amplifier and differential analyzer used with the scintillation spectrometer is given. The results from the authors' measurements agree with the Tb[160] decay scheme proposed by Burson et al. (Phys. Rev. 94, 103(1954). (R.V.J.)

STEPANENKO, I. P.

Category   :   USSR/Electronics - Semiconductor Devices and Photoelements   H-8

Abs Jour   :   Ref Zhur - Fizika, No 2, 1957, No 4368

Author   :   Shchigal', F. A., Madoyan, S. G., Petrov, L. A., Gol'denberg, V. A.,
                Lazareva, G. V., Stepanenko, I P., Shuyskiy, L. I.

Title   :   Germanium Diodes and Transistors and their Application

Orig Pub   :   Radiotekhn. proiz-vo. Sb. I. M., 1956, 3-25

Abstract   :   Popular article

STEPANENKO, I.P.

Application of germanium diodes and triodes in instrument making and
automatics. Priborostroenie no.1:13-16 Ja '56.   (MLRA 9:8)
          (Germanium diodes) (Transistors) (Instruments)

AUTHOR   KONONOV B.N., STEPANENKO I.P.   PA - 2726
TITLE   Computation Schemes on Basis of Semiconductor Triodes.
            (Pereschetnyye skhemy na poluprovodnikovykh triodakh -Russian)

ABSTRACT   The paper under review deals with the schemes of the nodes of those
            computation devices which are typical representatives of the nonlinear
            pulse generator with semiconductor triodes. The currently most fre-
            quently used semiconductor apparatus (germanium diodes, punctiform
            germanium triodes of the n-type, and smelted (?) areal germanium triodes
            of the type p-n-p) are treated with particular attention. The possibili-
            ties of the apparatus of other types are only briefly indicated.
            The semiconductor triode as switch: In the computation scheme under con-
            sideration the active element operates as switch, i.e. it can be in ei-
            ther of two possible states (either open or closed). In the commutator
            circuit of the closed semiconductor triode there always flows an initial
            "uncontrollable" current I_{ko}. This current intensity is a parameter of
            the transistor. The areal triodes are characterized by a strong "creep-
            ing" of the current I_{ko}. The "maximally opened" state of the semiconduc-
            tor triode corresponds to the saturation with regard to the current in
            the commutator circuit. It is the main disadvantage of the punctiform tri-
            odes in the wiring schemes that they do not "contract to one point" at
            the saturation.

Card 1/2   For the computation schemes with areal triodes the paper under review

Computation Schemes on Basis of Semiconductor Triodes. PA - 2726

gives the most significant relationships with which it is possible to
comput the wiring. The following variations are discussed: computation
cell with independent displacement, wiring with automatic displace-
ment, wiring without displacement. Then follows a discussion of the au-
xiliary nodes of the computation schemes, of the forming cascade, and of
the high-voltage sources.

Some conclusions. It is possible to build the computation schemes entire-
ly on basis of semiconductor apparatus. Such schemes are extremely inex-
pensive, they can be very well operated by batteries, and therefore the
development of portable devices is promising. At the time being,the
semiconductor computation schemes can reach and even surpass the quality
of the computation schemes with electron tubes.
(With 16 reproductions).

ASSOCIATION
PRESENTED BY
SUBMITTED   19.9.1956
AVAILABLE   Library of Congress
Card 2/2

BEZBORODOV, N.V.; STEPANENKO, I.P.

Single-channel amplitude analyzers with increased discrimination.
Zbor. nauch. rab. MIFI no.12:92-103 '57.   (MIRA 10:11)
                    (Electronic instruments)

STEPANENKO, I.P., dots., kand. tekhn. nauk, red.; AKALUNIN, S.A., red.;
CHERNOV, V.S., tekhn. red.

[Use of transistors in electronic equipment; a collection of
scientific papers] Ispol'zovanie poluprovodnikovykh priborov v
uzlakh elektronnoi apparatury; sbornik nauchnykh rabot. Pod red.
I.P. Stepanenko. Moskva, Gos. energ. izd-vo. 1958. 175 p.

(MIRA 11:7)

1. Moscow. Moskovskiy inzhenerno-fizicheskiy institut. Kafedra
elektroniki.

(Transistors)

GLADKOV, I. P., Doz., Moscow Engineering Physics Institute

"Parameters of high frequency transistors" (Section VII)

report submitted for Measurement and Automation, Scientific Society for (Hungarian) Intl Measurement Conference - Budapest, Hungary, 24-30 Nov 58

STEPANENKO, I. P.

A. O. Filippov, I. P. Stepanenko, B. N. Kononov, T. M. Agakhanlan, L. A. Serkin, L. N. Patrikeyev, "Certain components of a digital computer using semiconducting triodes." Scientific Session Devoted to "Radio Day", May 1958, Trudrezervizdat, Moscow, 9 Sep 58.

The balanced operation of semiconducting elements of a computer (analyzed in the note "Elements of semiconducting computers") is verified in three basic components of a parallel type machine: the register; counter and adder. Logical circuits of the components mentioned are analyzed and a method and results of testing are presented. An experimental investigation has been made on four types of each of the components.

Experiments were carried out by changing the ambient temperature, the voltage of the supply source, by scattering the parameters of the components and replacement of the semiconducting instruments, by humidity. The experiments showed reliable operation of the set of computer elements developed.

STEPANENKO I. I.

L. A. Serkin, I. P. STEPANENKO, B. N. Kononov, T. M. Agakhanyan, A. G. Filippov, L. N. Patrikeyev: "Elements of semiconducting digital machines." Scientific Session Devoted to "Radio Day", May 1958, Trudrezervizdat, Moscow, 9 Sep. 58

Results are presented of the development of systems of fundamental logical elements using semiconducting instruments for a digital computer. Fundamental computational relations and experimental characteristics of the elements are presented. Among the system elements are: a trigger, a conincidence circuit and an amplifier-limiter. The elements guarantee reliable operation of the fundamental components of a computer at a 500 kc frequency of the main (cyclic) pulses in an -60° C---+ 50° temperature range with the relative humidity 98%.

Stepanenko, I. P.

AUTHORS: Kononov, B. N., Lebedev, V. A., Serkin, L. A.,   119-1-4/13
                  Stepanenko, I. P., Filippov, A. G.

TITLE: Experiences With a Newly-Developed Register Operating With
                  Laminar Semiconductor Triodes (Opyt razrabotki registra na
                  ploskostnykh poluprovodnikovykh triodakh)

PERIODICAL: Priborostroyeniye, 1958, Nr 1, pp. 1o-13 (USSR)

ABSTRACT: The possibilities are shown of how to use semiconductor
                  triodes in numerical calculating machines. By means of a
                  block of "movable registers", the scheme of which is given,
                  the possibility of its application is proved. The register
                  mentioned can take up a numerical code and pass it on to the
                  left or right but it can also store a numerical code no
                  longer needed.
                      The main block is a decoder which brings about a
                  comparison of the states of neighbouring triggers. A switch-
                  -diagram is given for the triggers. The radio-technical
                  units used are discussed. It is most useful to employ
                  triodes with common emitters for the amplifiers used. With
                  such connections and with the aid of a transformer tuning
Card 1/2   as well as of an R-C-member as corrector in the emitter

Experiences With a Newly-Developed Register Operating
With Laminar Semiconductor Triodes   119-1-4/13

circuit a maximum amplification even of short impulses can
be reached. With a certain arrangement to a lo - 14 fold
power amplification can be reached with a duration of the
input pulse of 0,5 μs. There are 6 figures and 3 references,
all of which are Slavic.

AVAILABLE: Library of Congress

1. Triodes-Application

Card 2/2

SOV/142-58-4-16/30

AUTHOR: Agakhanyan   T.M., Kononov, B.N., Stepanenko, I.P.

TITLE: On the Terminology of Transistor Electronics (O terminologii v oblasti tranzistornoy elektroniki)

ABSTRACT: The paper summarizes the most important questions pertaining to Soviet terminology in the field of transistor electronics. The section "General Questions" deals with definitions for the concepts Semi-Conductor; Transistor; "Transistron"; and "Stereotron". Finally hole and electron transistors are defined. The second section deals with questions of junctions (plane and point change-over) as well as drawn and diffused junctions. Then the author deals with diodes and their functions and with triodes. A special section deals with the parameters of the triodes. Finally the paper deals with circuit diagrams. The editorial staff
Card 1/2   request the readers to contribute further to the field

SOV/142-58-4-16/30

On the Terminology of Transistor Electronics

of defining scientific terminology.

ASSOCIATION: Kafedra elektroniki Moskovskogo inzhenerno-fiziches-
kogo instituta   (Chair   of Electronics, Moscow
Institute of Engineering Physics)

SUBMITTED: April 21, 1958

Card 2/2

STEPANENKO, I.P.

Utilizing the special properties of semiconductor diodes. Izv. vys. ucheb. zav.; radiotekh. no.1:13-24 Ja-F '58. (MIRA 11:4)

1. Rekomendovana kafedroy elektroniki Moskovskogo inzhenerno-fizicheskogo instituta.
(Diodes) (Semiconductors)

SOV/142-58-4-25/30

AUTHOR: Stepanenko, I.P., Docent

TITLE: Theses Submitted for the Degree of Candidate of Sciences (Dissertatsii na soiskaniyeuchenoy stepeni kandidata nauk)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - Radiotekhnika, 1958, Nr. 4, p 514 (USSR)

ABSTRACT: The following theses are discussed in this paper:
1) Agakhanyan, T.M. The Work of a Impulse Amplifier in the Field of Large Time Periods. 2) Kononov, B.N. Symmetrical Triggers Using Semi-Conductor Triodes. 3) Zabiyakin, G.I. Time Interval Measuring Devices with Simplex Spiral Sweep.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Institute for Engineering Physics)

Card 1/1

SOV/142-58-6-20/20

30(7)

AUTHOR: Stepanenko, I. P., Docent

TITLE: International Congress on Atomic Energy and Electronics
(Mezhdunarodnyy kongress po atomnoy energii i elektronike)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy — Radiotekhnika,
1958, Nr 6, pp 744-746 (USSR)

ABSTRACT: This is a report on the V International Congress on Atomic
Energy and Electronics held in Rome on June 16-28, 1958.
P. V. Timofeyev, Corresponding Member, AS USSR, reported on
"A New Type of Highly-Sensitive Camera Tube — Ebikon."

ASSOCIATION: Kafedra elektroniki Moskovskogo inzhinerno-fizicheskogo
instituta (Chair of Electronics of the Moscow Physics and
Engineering Institute)

SUBMITTED: August 5, 1958

Card 1/1

06544
SOV/142-2-2-20/25

AUTHOR: Stepanenko, I.P., Docent

TITLE: Dissertations for Acquiring the Academic   Degree of
               Candidate of Sciences

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika,
               1959, Vol 2, Nr 2, p 254 (USSR)

ABSTRACT: A.D. Chesnokov presented a dissertation for acquiring
               the academic   degree of Candidate of Sciences "Loga-
               rithmic Automatic Intensimeters" (Logarifmicheskiye
               avtointensimetry) prepared   under the scientific guid-
               ance of Candidate of Technical Sciences A.V. Nikolayev.
               The defense of the dissertation took place on June 9,1958.
               The examining board included   Doctor of Physical
               and Mathematical Sciences, Professor M.S. Kozodayev
               and Candidate of Technical Sciences, Docent A.A. Mar-
               kov. Principles of construction, circuitry, errors
               and quick-response of logarithmic intensimeters were
               considered. Intensimeters are measuring instruments
               of the mean frequency of statistically distributed
Card 1/2   pulses with logarithmic dials. The author developed

·Dissertations for Acquiring the Academic
of- Sciences

06544
SOV/142-2-2-20/25
Degree of Candidate

and described two versions: 1) with a self-recorder
having a profiled measuring slide wire, and 2) with a
diode measuring circuit, producing electronically
the logarithmic form. The latter version seemed to
be more suitable for future application. The device
facilitates the registration of radioactive decay
processes of isotopes with a great range of half-live
periods.and with a wide range of intensity changes.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow
Institute of Engineering and Physics)

Card 2/2

9 (2, 9)

06368
SOV/142-2-4-21/26

AUHTOR: Stepanenko, I.P., Docent

TITLE: Dissertations for Acquiring the Scientific Degree of
            a Candidate of Sciences

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika,
            1959, Nr 4, Vol 2, pp 496-497   (USSR)

ABSTRACT: The following dissertations for obtaining the scienti-
            fic degree of a Candidate of Science were defended at
            the Moskovskiy inzhenerno-fizicheskiy institut (Moscow
            Engineering Institute of Physics): A.A. Glazkov: "High-
            er Harmonics of TM Waves in a Diaphragm-Type Waveguide
            of an Electron Accelerator" (Vysshiye garmoniki volny
            TM v diafragmirovannom volnovode lineynogo elektronno-
            go uskoritelya); December 22, 1958; supervisor: Doc-
            tor of Physical and Mathematical Sciences, Professor
            P.A. Ryazin; official opponents: Doctor of Physical
            and Mathematical Sciences, Professor P.Ye. Krasnushkin,
            Candidate of Technical Sciences Ya.M. Turover. Higher
Card 1/4   harmonics unavoidably accompany the basic accelera-

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of Sciences

tion wave in a diaphragm-type waveguide. Their influ-
ence on the work of a linear   electron accelerator
was established in the first approximation. The phy-
sical origin and the properties of the higher harmo-
nics were investigated. A theory was developed for
calculating the harmonics distribution function in re-
gard to the partial power of the basic wave depending
on the load parameter α/λ and the phase velocity β.
It is shown that the amplitude of the basic acceler-
ation wave is reduced by 30% as a result of the con-
sumption of high-frequency power by the higher har-
monics of the TM wave. This reduction of the effec-
tive flow of high-frequency energy must be taken into
consideration when designing a linear accelerator, to-
gether with the power consumption for accelerating
particles (load current) and surface currents in the
waveguide (attenuation). Numerical results of calcu-
Card 2/4   lation are presented in graphs convenient for engi-

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of Sciences

neering calculations. The calculation results were
checked experimentally by the reactive sonde method.
The analysis of the operation of well-known linear
accelerators shows that the missing rated energy of
electrons observed on these devices may be explained
by accounting the harmonics. - N.P. Sobenin: "The De-
velopment of Methods of Checking the Phase Velocity
Experimentally in a Waveguide of a Linear Electron
Accelerator" (Razrabotka metodov eksperimental'noy
proverki fazovoy skorosti v volnovode lineynogo elek-
tronnogo uskoritelya); December 22, 1958; supervisor:
Doctor of Physical and Mathematical Sciences P.A. Rya-
zin; official opponents: Doctor of Technical Sciences
L.N. Loshakov, Doctor of Technical Sciences B.K. Shem-
bel'. The phase velocity deviates from the selected
optimum values, because of inadequate accuracy of the
existing calculation methods for the diaphragm-type
Card 3/4   waveguide dimensions and unavoidable manufacturing

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errors. Measurements are necessary for checking the phase velocity experimentally. Checking a waveguide of a constant structure is not difficult. Measuring the phase velocity in an input resonator causes considerable difficulties, even for $\pi/2$ oscillations. The author presented a selective description of methods developed for solving such problems: the phase meter method and the method of the reflecting piston. The method of selecting nonreflecting loads, which provides traveling wave conditions in the waveguide, may be used for different measurements in a diaphragm-type waveguide. Experimental, parametric curves are presented for determining the diaphragm-type waveguide dimensions with an accuracy, exceeding the accuracy of other theoretical methods presently known. Experimental data, obtained on operating linear accelerators, show a good coincidence with the assumptions developed in this paper.

Card 4/4

FEDOTOV, Ya.A., otv.red.; GAL'PERIN, Ye.I., zamestitel' otv.red.; BARKANOV, N.A., red.; BERGEL'SON, I.G., red.; BROYDE, A.M., red.; KAMENETSKIY, Yu.A., red.; KAUSOV, S.F., red.; KRASILOV, A.V., red.; KULIKOVSKIY, A.A., red.; NIKOLAYEVSKIY, I.F., red.; PENIN, N.A., red.; STEPA-NENKO, I.P., red.; VOLKOVA, I.M., red.; SVESHNIKOV, A.A., tekhn.red.

[Transistor devices and their applications; collection of articles] Poluprovodnikovye pribory i ikh primenenie; sbornik statei. Moskva, Izd-vo "Sovetskoe radio." No.4. 1960. 423 p.   (MIRA 13:5)
     (Transistors)   (Electronic circuits)

FEDOTOV, Ya.A., otv.red.; BARKANOV, N.A., red.; BERGEL'SON, I.G., red.;
      BROYDE, A.M., red.; GAL'PERIN, Ye.I., zam.otv.red.; KAMENETSKIY,
      Yu.A., red.; KONEV, Yu.I., red.; KRASILOV, A.V., red.; KULIKOVSKIY,
      A.A., red.; NIKOLAYEVSKIY, I.F., red.; STEPANENKO, I.P., red.;
      VOLKOVA, I.M., red.; SVESHNIKOV, A.A., tekhn.red.

[Semiconductor devices and their applications] Poluprovodnikovye
pribory i ikh primenenie; sbornik statei. Moskva, Izd-vo "Sovetskoe
radio." No.5. 1960. 270 p.   (MIRA 13:10)
                        (Transistors)

FEDOTOV, Ya.A., otv.red.; BARKANOV, N.A., red.; BERGEL'SON, I.G., red.;
BROYDE, A.M., red.; GAL'PERIN, Ye.I., red.; KAMENETSKIY, Yu.A.,
red.; KAUSOV, S.F., red.; KONEV, Yu.I., red.; KRASILOV, A.V.,
red.; KULIKOVSKIY, A.A., red.; NIKOLAYEVSKIY, I.F., red.;
STEPANENKO, I.P., red.; VOLKOVA, I.M., red.; SMUROV, B.V.,
tekhn.red.

[Semiconductor devices and their applications] Poluprovodni-
kovye pribory i ikh primenenie; sbornik statei. Moskva, Izd-vo
"Sovetskoe radio". No.6. 1960. 333 p.   (MIRA 13:12)
        (Semiconductors)   (Transistors)

STEPANENKO, I.P., kand.tekhn.nauk, dotsent

International Conference on Transistor Devices. Izv.vys.ucheb.
zav.; radiotekh. 3 no.1:130-133 Ja-F '60.   (MIRA 13:8)

1. Zaveduyushchiy kafedroy elektroniki Moskovskogo inzhenerno-
fizicheskogo instituta.
             (Transistors--Congresses)

25825
S/142/60/003/006/016/016
E036/E135

9,4340

AUTHOR: Stepanenko, I.P.

TITLE: The temperature dependence of the voltage across a
            p-n junction

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy,
            Radiotekhnika, 1960, Vol.3, No.6, pp. 667-670

TEXT: An expression for the variation of voltage across a
p-n junction with temperature at constant currents is derived, on
the basis of the simple classical junction theory.   The use of
expressions derived by J. Schaffner and R. Shea (Ref.1: "The
variation of the forward characteristics of junction diodes", PIRE,
1955, No.1, 101) and B.N. Kononov (Ref.2: "Semiconductor diode
voltage stabilisers", Priborostroyeniye, 1956, No.10, 9) gives
temperature coefficients which do not always agree with measure-
ments. The classical diode formula gives the diode voltage as:

$$U = \varphi_T \, \log \left(1 + \frac{I}{I_o} \right) \tag{4}$$

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The temperature dependence of the ...

where φ_T is kT/q, where k is the Boltzmann constant, T is the temperature and q the electronic charge. The given current is I and

$$I_0 = S \cdot q \cdot \sqrt{\frac{D}{\tau}} \; p_0 \qquad (3)$$

Here D and τ are the diffusion coefficient and lifetime, respectively, p_0 is the equilibrium hole concentration, S is the junction area. The temperature dependence of I_0 may be written:

$$I_0 = I_{00} \; e^{-\vartheta_T \cdot \frac{\varphi_3}{\varphi_T}} \qquad (8)$$

in which the temperature dependence of D and τ are neglected. At low temperatures, extrinsic range, I_0 takes the form

$$I_0 = I_{00}' \; e^{-\frac{\varphi_3}{\varphi_T}} \qquad (7a)$$

where:
Card 2/ 6

The temperature dependence of the ...

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E036/E135

$$I'_{00} = S \cdot q \sqrt{\frac{D}{\tau}} \cdot \frac{B^2}{n_0}$$

In the intrinsic range, high temperatures, I_0 takes the form:

$$I_0 = I_{00}^{\ast} \, e^{-\frac{1}{2}\frac{\varphi_1}{\varphi_T}} \qquad\qquad (7b)$$

where

$$I_{00}^{\ast} = S \cdot q \sqrt{\frac{D}{\tau}} \, B$$

The two parameters I_{00} and φ_T thus define the two temperature ranges. In these expressions φ_1 is the energy gap and

$$B \approx 2 \left(\frac{2 \pi m \, kT}{h^2} \right)^{3/2}$$

m and h being the electron mass and Planck's constant, respectively. If the range includes temperatures close to the

Card 3/6

The temperature dependence of the ...
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S/142/60/003/006/016/016
E036/E135

critical temperature, where impurity conduction just dominates the intrinsic conduction, average parameters may be used conditionally:

$$I_{00} = \sqrt{I_{00}' \cdot I_{00}''} \qquad 0.5 < \vartheta_T < 1.0$$

It is evident that the temperature dependence of the voltage is a function of both the material, Ge or Si, and the temperature range and is given by:

$$U(T) = \vartheta_T \varphi_3 - \frac{kT}{q} \log \frac{I_{00}}{I} \qquad (11)$$

This is applicable in all practical cases. By differentiation

$$\varepsilon = \frac{dU}{dT} = \frac{U - \vartheta_T \varphi_3 \frac{I}{I + I_0}}{T} \qquad (12a)$$

assuming T is constant.

Values of ε are calculated for Ge and Si using typical values.

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The temperature dependence of the ... E036/E135

In the extrinsic range ε is somewhat higher for Si than Ge, ~ 2.3 mv/degree compared to ~ 1.7 mv/degree for Ge. The temperature changes necessary to double the current I_c at various points over the temperature range from room temperature upwards, to 130 °C for Si, are briefly discussed. No account is taken of leakage current or space charge generated current. The temperature coefficient discussed by Schaffner and Shea in Ref.1 is shown to be very limited in applicability.
There are 4 references: 1 Soviet and 3 non-Soviet. The English language references read as follows:
Ref.1: as quoted in the text.
Ref.3: D. Dewitt, A. Rossoff. "Transistor Electronics", McGraw-Hill, 1957, Ch. 2.
Ref.4: C. Sah, R. Yoyce, W. Shockley. "Carrier generation and recombination in p-n junctions and p-n junction characteristics". PIRE, 1957, No. 9, 1228.
There is also an English language reference in the footnote:
Madigan ("Electronic Industries", 1959, No.12, p.80).

Card 5/6

25825
S/142/60/003/006/016/016

The temperature dependence of the   E036/E135

ASSOCIATION: Kafedra elektroniki Moskovskogo inzhenerno-
fizicheskogo instituta
(Electronics Department of Moscow Engineering and
Physics Institute)

SUBMITTED: September 5, 1960

Card 6/6

STEPANENKO, I.P.

PHASE I BOOK EXPLOITATION

SOV/5780

Erglis, Kronid Eduardovich, and Igor' Pavlovich Stepanenko

Elektronnyye usiliteli (Electronic Amplifiers) Moscow, Fizmatgiz, 1961.   487 p.
25,000 copies printed.

Ed.: A. I. Kostiyenko; Tech. Ed.:   S. N. Akhlamov.

PURPOSE: This book is intended for students in schools of higher education and
for technical personnel concerned with radar, automation and telemechanics,
computer techniques, and nuclear physics.

COVERAGE: The book discusses the theory, calculation, and fundamental circuits
of tube and transistor amplifiers. Investigations of amplifier parameters
and characteristics are carried out by both operational and frequency methods.
The physical substance of the processes of distortion of the front and peak
of pulses by resistor- and transformer-coupled amplifiers, as well as the
distortions of the amplitude envelope by tuned amplifiers, are analyzed.

Card 1/18

KAGANOV, Izrail' L'vovich; STEPANENKO, I.P., dots., retsenzent; KOMAR,
    V.G., prof., retsenzent; ANTIK, I.V., inzh., red.; LARCHONOV,
    G.Ye., tekhn. red.

[Industrial electronics; a general course] Promyshlennaia elektro‧
nika; obshchii kurs. Moskva, Gos. energ. izd-vo, 1961. 558 p.
                                   (MIRA 15:1)

                 (Electronics)

STEPANENKO, I.P.

Use of a reference diode instead of an accelerating capacitance.
Izv. vys. ucheb. zav.; radiotekh. 4 no.1:102-103 Ja-F '61.
(MIRA 14:4)

1. Rekomendovano kafedroy elektroniki Moskovskogo inzhenerno-
fizicheskogo instituta.
                    (Pulse circuits)

AGAKHANYAN, S.M.; KONONOV, B.N.; STEPANENKO, I.P.

Concerning the terminology in the field of transistor electronics.
I_{zv}. vys. ucheb. zav.; radiotekh. 4 no.1:110-114 Ja-F '61.
(MIRA 14:4)
1. Kafedra elektroniki Moskovskogo inzhenerno-fizicheskogo
instituta.
(Transistors—Terminology)

STEPANENKO, I.P.

Transient characteristics of a junction transistor diode. Izv.
vys. ucheb. zav.; radiotekh. 4 no. 2:175-184 Mr-Ap '61.
(MIRA 14:5)

1. Rekomendovana kafedroy elektroniki Moskovskogo inzhenerno-
fizicheskogo instituta.
                    (Transistors) (Diodes)

STEPANENKO, I.P.

Letter to the editor. Izv.vys.ucheb.zav., radiotekh. 4 no.6:734
N-D '61.   (MIRA 15:4)
                    (Transistors) (Diodes)

S/194/62/000/006/213/23?
D256/D308

9.2580

AUTHOR: Stepanenko, I.P.

TITLE: Static operation conditions of a trigger with
emitter coupling

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika,
no. 6, 1962, abstract 6-7-229 f (Poluprovodnik. pri-
bory i ikh primeneniye, no. 7, M., Sov. radio, 1961,
321-340)

TEXT: The mechanism of operation of a trigger, its working cycle
and the input characteristic including a section of a negative re-
sistivity are analyzed by means of linear equivalent circuits. For-
mulas for engineering design are derived taking into account the
tolerances of the resistors and the transistor parameters. Recom-
mendations on the use of triggers operating with unsaturated tran-
sistors are given. The stability conditions and the dynamic charac-
teristics were not considered. 4 references. [Abstracter's note:
Complete translation.]

Card 1/1

FEDOTOV, Ya.A., otv. red.; BERGEL'SON, I.G., red.; GAL'PERIN, Ye.I.,
zam. otv. red.; KAMENETSKIY, Yu.A., red.; KAUSOV, S.F., red.;
KONEV, Yu.I., red.; KRASILOV, A.V., red.; KULIKOVSKIY, A.A.,
red.; NIKOLAYEVSKIY, I.F., red.; STEPANENKO, I.P., red.;
VOLKOVA, I.M., red.; BELYAYEVA, V.V., tekhn. red.

[Semiconductor devices and their applications]Poluprovodnikovye
pribory i ikh primenenie; sbornik statei. Pod red. IA.A.Fe-
dotova. Moskva, Izd-vo "Sovetskoe radio." No.8. 1962. 332 p.
                                                (MIRA 15:10)
            (Transistors)

33793

S/108/62/017/002/008/010
D201/D305

9, 4340 (1143, 1160, 1003)

AUTHOR: Stepanenko, I.P., Member of the Society (see Association)

TITLE: The design of shunts and of additional resistances for the series and parallel connection of semiconductor diodes

PERIODICAL: Radiotekhnika, v. 17, no. 2, 1962, 56 - 63

TEXT: In the present article the author makes an attempt to give an accurate and simple method of calculating shunts and additional resistances for series and parallel connected semi-conductor diodes. The author uses technical diode data as given by the manufacturer and taking into account the resistor tolerances. The analysis is based on the linear equivalent circuit of a junction diode which does not allow for high frequency effects and applies to frequencies below 1 kc/s only. The equivalent circuit of a junction diode assumes the reverse current characteristic of the diode to be linear, so that the normally specified mean value of reverse current

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The design of shunts and of ...

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D201/D305

characteristic of the diode to be linear, so that the normally spe-
cified mean value of reverse current for a max. inverse voltage
applied may be taken as half of the max. reverse current. Similarly
in the forward direction U_{max} may be taken as 2 U_{av}. The reverse
current is, in the diode data, limited only from its maximum. It
may be assumed, therefore, that $I_{min} = 0$. The values of U_{max} and
I_{max} should be taken at the maximum operating temperature. When ne-
cessary the 'ageing' and 'creep' of their characteristics should be
taken into account. For series connection of n diodes the following
expressions are easily derived:

$$R \leqslant \frac{n}{n-1} R^* [1 - \xi_u(1 + \triangle)] \qquad (10)$$

and

$$R^* \geqslant R_L \frac{\nu_r (n-1)}{n^2(1 - \triangle)[1 - \xi_u(1 + \triangle)]} \qquad (11)$$

where R is the nominal value of shunt resistors; $R^* = U_{max}/(I_{max} -$

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The design of shunts and of ...

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$- I_{min}$) - the assumed new reverse D.C. resistance of diodes of the given type, $\xi_u = U_{rev}/n \cdot U_{max}$ - the reverse voltage diode utilization factor; $\triangle$ - the relative resistor tolerance; R_L - load resistance; n - number of diodes; ν_r - rectification coefficient. Similarly for n diodes connected in parallel

$$r \geqslant \frac{n-1}{n} \frac{r^*}{1 - \xi_i(1 + \triangle)} \tag{15}$$

$$r^* \leqslant R_L \frac{n^2}{n-1} \frac{1 - \xi_i(1 + \triangle)}{\nu_i(1 + \triangle)} \tag{16}$$

are obtained, in which r - the resistance connected in parallel to every diode, n - number of diodes in parallel connection, r^* - parameter analogous to R* in series connection; $\xi_i = I_{rev}/2I_{max}$ - the diode current utilization factor; $\nu_i = 1/(1 - \eta)$ - determines the

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The design of shunts and of ...

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D201/D305

rectifier efficiency in the absence of other losses, η being the efficiency. The above formulas make it possible to determine the resistances associated with diodes connected either in series or in parallel when the voltage applied or the current exceed their rated values. There are 5 figures and 2 Soviet-bloc references.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi im. A.S. Popova (Scientific and Technical Society of Radio Engineering and Electrical Communications imeni A.S. Popov) [Abstractor's note: Name of Association taken from first page of journal]

SUBMITTED: February 4, 1961

Card 4/4

L 47722-65

ACCESSION NR AM4042762   BOOK EXPLOITATION   /3   S/
                                                       B+/

Stepanenko, Igor' Pavlovich

Principles of transistor theory and transistor circuits (Osnovy teorii
    tranzistorov i tranzistorny kh skhem), Moscow, Gosenergoizdat, 1963, 375 p.
    illus., biblio., index. 42,000 copies printed.

TOPIC TAGS: transistorized amplifier, transistorized circuit, transistorized
pulse generator, semiconductor diode, power supply, transistor electronics

PURPOSE AND COVERAGE: This book is devoted to the analysis and design of basic
types of transistorized amplifiers, pulse circuits and power supply. The
circuitry analysis precedes a detailed consideration of the physical process
in semiconductor diodes and transistors and their characteristics as circuit
elements. The book is intended for engineers, graduate students and students
specializing in computer technology, instrument building, automation,
measuring technology, and a number of fields of radio engineering and electrical

L 47722-65

ACCESSION NR AM4042762   O

of tube electronics.

TABLE OF CONTENTS (abridged):

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ACCESSION NR AM4042762

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SUBMITTED: 16Nov63   SUB CODE: EC, DP

NO REF SOV: 103   OTHER: 041

Card 3/3

PATRIKEYEV, L.N.; STEPANENKO, I.P.

Present state and some prospects of microelectronics. Izv.
vys. ucheb. zav.; radiotekh. 6 no.6:587-601 N-D '63.
(MIRA 17:1)

1. Rekomendovana kafedroy elektroniki Moskovskogo inzhenerno-
fizicheskogo instituta.

L 19558-65
ACCESSION NR: AP4047241   0

ates a 20% parameter spread; and 3) a circuit consisting of two pa-
rallel triggers has four stable states and qualitatively new char-
acteristics; the latter fact was corroborated by experiments. Orig.
art. has: 10 figures, 55 formulas, and 1 table.

ASSOCIATION: none

SUBMITTED: 14Feb64   ENCL: 00   SUB CODE: EC

NO REF SOV: 002   OTHER: 001

(MIRA 17:11)

ABSTRACT:

A transistorized circuit that is a model of high-Q nonlinear voltage-
controlled capacitors with a high ratio of maximum-to-minimum capacitance
is described. The circuit consists of a transistorized three-stage feedback
amplifier which contains no inductive components. The equivalent input
impedance and Q-factor of the circuit are controlled by the input voltage.
The shape of the circuit volt-capacitance characteristics can easily be
changed to resemble various complex shapes — a dome-shape, for example. High-
frequency transistors must be used in the circuit to obtain the best frequency
characteristics. The volt-capacitance characteristics of the circuit resemble

Card 1/2   UDC: 621.382.31

ACC NR: AP7002828

those for surface-charge barrier capacitors. Actually, only the reactive
(capacitive) component of the circuit input impedance is voltage-variable.
The variation range of the circuit capacitance (C_{max}–C_{min}) is significantly
smaller than that for actual capacitors. This constitutes a significant
advantage over actual capacitors.   [IV]

SUB CODE: 09/   SUBM DATE: 04Apr66/   ORIG REF: 004/   ATD PRESS: 5114

Card   2/2

STEPANENKO, I. Z.

STEPANENKO, I. Z. -- "Dynamic Expansion of Pores in Cohesive Soil." Cand
Phys-Math Sci, Kiev State U, Kiev 1953. (Referativnyy Zhurnal--Mekhanika, Jan 54)

SO: SUM 168, 22 July 1954

ISHLINSKIY, A.Yu.; ZVOLINSKIY, N.V.; STEPANENKO, I.Z.

Theory of elasticity. Dokl.AN SSSR 95 no.4:729-731 Ap '54.

(MLRA 7:3)

1. Deystvitel'nyy chlen Akademii nauk USSR (for Ishlinskiy).
(Soil mechanics) (Blasting)

USSR/Physics - Plasticity

FD-3091

Card 1/1   Pub. 85 - 6/16

Author   : Zvolinskiy, N. V.; Ishlinskiy, A. Yu.; Stepanenko, I. Z.

Title   : Remarks on S. S. Grigoryan's article "Stating of dynamic problems
                for ideal plastic media"

Periodical   : Prikl. mat. i mekh., 19, Nov-Dec 1955, 733

Abstract   : The present authors remark that S. S. Grigoryan carried out interesting
                investigations of the equation of state of plastic medium, which
                equation was proposed by them ("Dynamics of ground masses," DAN SSSR,
                95, No 4, 1954), and his results deserve attention. Grigoryan pointed
                out that the energy condition on the surface of strong discontinuity
                is fulfilled during the entire time of the process only if in the
                external region the pressure equals the critical pressure, as was
                assumed in the authors' work, and he also made a conclusion concerning
                the impossibility of the existence of a certain zone III etc. As a
                result Grigoryan concludes categorically that the stated problem can-
                not be solved by means of the authors' equation of state. The present
                authors cannot agree with the categorical character of this conclusion.
                The authors consider their scheme as a limiting scheme and not as com-
                pletely solving the problem of deformation of densification of grounds.
                The entire problem consists in whether their description gives the main
                outlines of the phenomenon of dynamic densification of grounds. The
                problem remains open.

Submitted   :

STEPANENKO, I.Z.,

"Enlarging a Cylindrical Opening in a Limitless Ideal, Incompressible Fluid," by I. Z. Stepanenko, Kiev State University imeni Shevchenko, Prykladna Mekhanika, Vol 2, No 4, 1956, pp 456-459

"Studies the impossibility of enlarging a cylindrical opening in a limitless ideal, incompressible fluid by finite pressure applied to its internal boundary.

"It is also shown that pressure suddenly applied to the boundary of a cylindrical hole in a limitless, ideal, incompressible fluid is instantly distributed throughout all of the fluid."

Sum 1239

STEPANENKO, I.Z. (Kiiv)

Expansion of circular cylindrical pipes subjected to dynamic loads
[with summary in Russian]. Prykl.mekh. 3 no.2:225-229 '57.

(MLRA 10:9)

1. Kiivs'kiy derzhavniy universitet.
              (Elastic plates and shells)

POLOZHIY, Georgiy Nikolayevich; PAKHAREVA, Nadezhda Alekseyevna; STEPANENKO,
Ivan Zakharovich; BONDARENKO, Pavel Stepanovich; VELIKOIVANENKO,
Ivan Maksimovich; ROZENKNOP, V.D., red.; KRYUCHKOVA, V.N., tekhn.red.

[Mathematics] Matematicheskii praktikum. Pod red. G.N.Polozhego.
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1. Batayskiy zavod montazhnykh zagotovok.
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[Machines for harvesting and ensilaging green fodder]Mashiny
dlia uborki i silosovaniia zelenykh kormov. Moskva, Mashgiz,
1961. 106 p.   (MIRA 15:12)
      (Ensilage)   (Agricultural machines)

STEPANENKO, L., kand.tekhn.nauk; PUSTOVOYTOV, V., inzh.

Study of the protracted support of glass-reinforced plastic rods for concrete reinforcement. Bud. mat. i konstr. 4 no.2: 35-37 Mr-Ap '62. (MIRA 15:9)
(Glass reinforced plastics—Testing)
(Concrete reinforcement)

KOTS, G.A.; RAZUMNAYA, Ye.G.; ROZHKOV, V.D.; PAVLENKO, G.G.; STEPANENKO, L.G.; ROZHKOVA, Ye.V., nauchnyy red.; ANTOKOL'SKAYA, A.M., red. izd-va; BYKOVA, V.V., tekhn. red.

[Methodical guide to the use of ore separation units for the mineralogical analysis of ores and rocks.] Metodicheskoe rukovodstvo po primeneniiu malogabaritnykh ustanovok dlia mineralogicheskogo analiza rud i gornykh porod. Moskva, Gosgeoltekhizdat, 1963. 110 p. (Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut mineral'nogo syr'ia. Trudy, no.10)
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Observing the flight of the gray grain moth. Zashch. rast. ot
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PROCESSES AND PROPERTIES INDEX

The catalytic oxidation of toluene by air. M. I. KUZNETZOV, AND M. A. STEPAN-ENKO. *Ukrainskii Khem. Zhur.* 4, Tech. Pt., 163-77(1929).—With the object of devising a method for the com. production of B_zH and B_zOH by oxidation of PhMe with air 02 expts. were carried out on a small and a large scale. The larger scale app. consisted of a motor-driven air pump connected with a Rota gas-meter leading through an Al coil to a 1 l. Erlenmeyer flask half filled with PhMe. Both coil and flask were placed in a H_2O bath. The air and PhMe vapor mixt. passed through a dephlegmator to the glass reaction tube, 25 mm. in diam. and 40 cm. long, jacketed with a wider Fe tube passing through an asbestos-lined box. The reaction products entered a receptable cooled by an ice-salt mixt. where the vapors condensed, while the gaseous products after passing through liquid vaseline were collected in a gas tank. The oxidation of PhMe takes place as follows: (1) $PhMe + O_2 \longrightarrow PhCHO + H_2O$; (2) $PhMe + 3O \longrightarrow PhCO_2H + H_2O$; (3) $PhMe + 9O_2 \longrightarrow 7CO_2 + 4H_2O$ and is accompanied by the following partial decompn. reactions: (4) $PhCHO \longrightarrow CO + C_6H_6$; (5) $PhCO_2H \longrightarrow CO_2 + C_6H_6$. Expt. for the production of BzH.—The following catalysts were used in the small scale series: (a) basic Zn manganate; (b) V_2O_5 on asbestos; (c) V_2O_5 on pumice; (d) MoO_3 on asbestos; (e) Bi vanadate (prepd. according to Ephraim and Beck (C. A. 20, 1185) on pumice. The highest yield of

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OVER

ASM-SLA   METALLURGICAL LITERATURE CLASSIFICATION

BzH (40.1% of the oxidized PhMe) was obtained with MoO_3 on asbestos under the following conditions: length of contact layer 10 cm, diam. 17 mm., 1. of air per hr. 80, temp. of catalyst 526°, temp. of the air + PhMe entering the reaction tube 85°, 1. air per g. PhMe 0.44, amount of volatilized PhMe 4-16 g., duration of expt. 20-55 min. The total amount of oxidized PhMe was 13.7%, of which 40.1% was BzH, 30.0% BzOH and 29.9% CO and CO_2. The expts. with MoO_3 were repeated with the large scale app. The MoO_3 (on pumice) was preheated to 350° before starting the expt. The yield of BzH reached 87.8% of the oxidized PhMe under the following conditions: temp. of catalyst 475°, temp. in dephlegmator 58 (0)°, volatilized PhMe 84.4 g., velocity of air per hr. 80 1., duration of expt. 1 hr. 30 min., length of contact layer 24 cm. Other oxidation products: BzOH 4.6%, CO none, CO_2 7.6%, total amount of reacted PhMe 9.79%. To increase the amount of the reacting PhMe, K. and S. carried out several expts. using MoO_3 directly in small pieces of 2-3 mm., suspecting that in previous expts. the MoO_3 was not uniformly deposited on the pumice. Besides, they reduced the velocity of the air current. Temp. of catalyst 500°, preheated at the beginning of the reaction to 400°, duration 1 hr. 15 min., volatilized PhMe 1225 g., amount of PhMe per cc. of catalyst 0.022 g. per hour, amount of air per g. PhMe 20.2 1., amount of the volatilized PhMe which reacted 42.3%, of which 55.2% was BzH, 5% BzOH, no CO, balance CO_2. *Conclusion.*—The results of the last expt. are fully satisfactory. *Expts. for the production of BzOH.*—For this series a large excess of air was used. 4.8-7 1. air per hr. passed through the carburetor and to the resulting PhMe-air mixt. 12-30 1. air per hr. was added before entering the reaction tube. As catalyst $Sn(VO_4)_2$ was applied. Temp. of catalyst 290°, velocity of air in carburetor 4.8 1. per hr., velocity of additional air 12 1. per hr., amount of air per g. PhMe 3.6 1., amount of PhMe per cc. catalyst 0.19 g. per hr., duration of reaction 1 hr., volatilized PhMe per 1., 4.7 g. *Results.*—Yield of BzOH 89.7%, BzH 7% of the reacted PhMe, amount of reacted PhMe 21.4% of that volatilized.

E. Bigloff

Coking of coal residue for electrode manufacture.
N. A. Nikolskii and M. A. Stepanenko. Coke and
Chem. (U. S. S. R.) 1932, No. 9, 9-16.—A series of lab.
expt., semi-plant and plant tests with prepn. of pitch coke
electrodes showed the possibility of producing ash-free
coke suitable for use in electrodes at approx. cost of 90
90 rubles (840-45) per ton.   James Surrel

METALLURGICAL LITERATURE CLASSIFICATION

Petrographic factors which affect the coking properties of coal. M. A. Stepanenko and L. E. Trukerman. *Coke and Chem.* (U. S. S. R.) 3, No. 10, 59-60(1933); *Chimie & industrie* 32, 310.—The coking properties of coal depend mainly on the nature of its constituents, and to a less extent on their proportions. The characteristic properties of the constituents, *i e.*, agglutinating power, swelling, evolution of gas, contraction, etc., persist in all the fractions. The presence of fusain (over 30%, in the Donetz coal that was investigated) in the highly carbonized vitrain, while it reduced the agglutination power slightly, contributed considerably to increase the hardness of the coke. The tests showed that, contrary to common belief, there is a close relationship between the swelling and fluidity of the coal, the former increasing with the latter. On the other hand, no relationship could be established between fluidity and agglutination; *e. g.*, though vitrain and durain have approx. the same agglutinating power, the fluidity of the former is several times as great as that of the latter.   A. P.-C.

Obtaining electrode coke from coal. N. Nikol'skii and M. Stepanenko. *Legkie Metal.* 3, No. 2, 26-32 (1934); cf. C. A. 28; 1842.—Coal contg. 5% ash was conc. in heavy liquids or by washing, the ash content being reduced to 0.5-0.6% with a 70% recovery. Coke made from this concentrate contained 0.76-0.90% ash and was satisfactory for the production of electrodes for Al bath. H. W. Rathmann

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METALLURGICAL LITERATURE CLASSIFICATION

Influence of treating conditions on the swelling capacity of coal. N. A. Nikol'skiĭ and M. A. Stepanenko. *Khim. Tverdogo Topliva* 5, 427-9(1934).—The swelling capacity of coal is increased at higher temp., while its shrinkage is lowered. Coals which have received a preliminary heat treatment may lose their capacity for swelling on coking, and the swelling capacity will be lower with a lower rate of coking. The expts. are described.   A. A. B.

Obtaining electrode coke from bituminous coal. N. A. Nikol'skii and M. A. Stepanenko. Coke and Chem. (U.S.S.R.) 1936, No. 9, 41-8. Coke for electrodes with low ash content (less 1%) was obtained from Donetz coals (East and West of the Smolyaninovskii mines) by concg. the coal in $ZnCl_2$ soln. (d. 1.28). The concentrates obtained (69.5 and 75.8% of the total coal) contd. 0.52 and 0.55% of the ash, against 11.20 and 1.61% (resp.) before treatment. The analysis of the ash in the concentrates was: SiO_2 38.65%, Fe_2O_3 15.20%, Al_2O_3 32.73%, CaO 4.15%, MgO 5.02% and SO_3 7.34%. The coke that was obtained from the treated coal contained 0.8% ash.

A. Pestoff

Manufacture of electrode coke from pitch tar residue at the industrial plant, according to the method of the Chemical Institute in Kharkov. N. A. Nikol'skil and M. A. Stepanenko.— *Coke and Chem.* (U. S. S. R.) 1934, No. 10, S 15.— A description.   A. Pestoff