K.E. Voroshilov) dealing with miscellaneous problems in the dynamics of machines, and the strength, stability, and hysteresis of structures. The scope of the articles is indicated by the table of contents below. Each individual report is accompanied by references.

TABLE OF CONTENTS:

Problems of Dynamics (Cont.)

AVAILABLE: Library of Congress

MS/lsb
3-9-59

Card 3/3

PANOVKIN, B. N.

33-4-1/19

AUTHOR: Panovkin, B. N.

TITLE: A Model of the Inner Corona Based on Radio Data. (Model' vnutrenney korony po radiodannym)

PERIODICAL: Astronomicheskiy Zhurnal, 1957, Vol. 34, No.4, pp. 505-515 (USSR)

ABSTRACT: The thermal radiation from the sun in the radio range has been studied by many workers. According to Ginsburg (Ref.1), Shklovskii (Ref.2), and Martin (Ref.3) this radiation is determined by the electron temperature of the upper Chromosphere and Corona. The most characteristic properties of this radiation are the following:

1. The effective temperature of the radiation increases with increasing wavelength;

2. A considerable amount of the radiation in the centimeter and meter range is found beyond the "optical disc";

3. There is an increase in brightness in the centimeter and decimeter range on the optical edge of the sun;

4. Near the minimum of the solar activity the radiating area in the decimeter and meter region is elliptical in form.

Card 1/4

A Model of the Inner Corona Based on Radio Data. 33-4-1/19

A detailed calculation of the distribution of the radio emission over the solar disc for different values of the temperature of the corona was carried out by Smerd (Ref.7).

Recent measurements using the interferometric method have produced a number of very interesting and fundamental facts which cannot be easily explained by existing models. The observations were obtained by Firror (Ref.21) at λ = 1.45 m, O'Brien et al (Ref.22), Swarup et al (Ref.23) at λ = 60 cm, and Ovsyankin et al (Ref.24) at λ = 24cm. These results are shown in Table 1 and Fig.1. It is clear from them that the maximum brightness in the distribution of radio brightness across the solar disc does not coincide with the solar limb (as predicted by theory) but lies inside the solar disc.

Any "radiomodel" of the upper layers of the solar atmosphere must explain, if only qualitatively, all the above properties of the distribution of radio brightness. The simple model of the corona used up to now cannot explain the above facts and there is not a single paper attempting to explain the displacement of the brightness maximum towards the solar centre. A modification of the simple isothermic model is

Card 2/4

now described and it is hoped that this will explain the new facts. It is shown that in constructing a model of the solar corona, which will be able to explain the radio data, it is necessary to take into account both the general non-uniformity of the corona and the change in the degree of non-uniformity with the positional distance. In the opinion of the author the only realistic model is that which takes into account the temperature gradient. The existing data (e.g. Allen Ref.32) allows one to determine the variation of temperature with distance from the surface of the sun. It is known that from the relatively cold Chromosphere the temperature rapidly increases to a maximum value and then falls off with distance (Fig.3). It is shown that even very approximate models with a temperature gradient explain the observed fact that the brightness peak does-not coincide with the solar limb in the decimeter range. The distribution of radio brightness over the solar disc at longer wavelengths is determined, to a large extent, by refraction. Refraction must be taken into account for wavelengths greater than 1.5 m. For such wavelengths the optical thickness is large and the outer layers of the corona play an important role. The corona must be taken as denser to the radiowaves than has been

A Model of the Inner Corona Based on Radio Data. 33-4-1/19

assumed until now.
There are 10 figures, 1 table and 40 references, 15 of which are Slavic.

SUBMITTED: December 14, 1956.

AVAILABLE: Library of Congress

Card 4/4

PANOVKIN, B. N.

"Temperature Distribution in the Internal Corona of the Sun Based on Radio Data,"

paper submitted at the Symposium on Radio Astronomy, Paris, 30-Jul - 6 Aug 58.

PANOVKIN, B.N.

Broadened plenum of the Committee on the Radio Astronomy.
Astron. tsir. no.190:28-29 Mr '58. (MIRA 11:9)

1. Fizicheskiy institut AN SSSR im. P.N. Lebedeva, Moskva.
(Radio astronomy)

9.9100
3.1800

80137
S/141/59/002/06/019/024
E192/E382

AUTHORS: Vitkevich, V.V., Panovkin, B.N. and Sukhovey, A.G.

TITLE: The Structure of the Electron Non-homogeneities in the Solar Super-corona

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1959, Vol 2, Nr 6, pp 1005 - 1007 (USSR)

ABSTRACT: One of the authors (V.V. Vitkevich, Refs 1-3) carried out some investigations of the solar super-corona during 1954-1958. However, his observations gave comparatively little information on the form of the scattered source. In the following the results of additional observations are represented. The investigations were carried out at the Krymskaya stantsiya FIAN (Crimean Astronomical Station) at the wavelength of 5.8 m by means of two radio-interferometers. Systematic observations were carried out during the whole of June, 1959. During this period the solar activity was comparatively stable and did not disturb the radiation from a source in the constellation of Taurus. A curve showing the intensity of the radiation from the source (which was covered by the solar-corona) is shown in Figure 1. It is seen (Curve 1) that the

Cardl/3

The Structure of the Electron Non-homogeneities in the Solar Super-corona

intensity decreased considerably on June 8; later, the intensity dropped further and reached a minimum value between June 14 and 16; further, the intensity increased and, beginning from June 24, it became constant. However, if the interferometer was oriented from East to West (Curve 2 of Figure 1) the intensity of the radiation followed a different pattern. At the Serpukhovskaya radiofizicheskaya stantsiya FIAN (Serpukhovo Radio-physics Station) it was possible to carry out the measurements at the wavelength of 3.5 m. The observations were done during mornings and evenings by employing an interferometer having a base of 320 m. The results obtained permitted the plotting of a curve showing the variations of the relative modulation depth during the morning measurements (Figure 3). The evening observations produced only a few points; these are denoted by crosses in Figure 3.

80137
S/141/59/002/06/019/024
E192/E382

The Structure of the Electron Non-homogeneities in the Solar Super-corona

There are 4 figures and 6 Soviet references.

ASSOCIATION: Fizicheskiy institut im. P.N. Lebedeva AN SSSR
(Physics Institute imeni P.N. Lebedev of the Ac.Sc., USSR)

SUBMITTED: December 7, 1959

4

Card 3/3

3(1)
AUTHORS: Vitkevich, V.V., and Panovkin, B.N. SOV/33-36-3-22/29

TITLE: On the Question of the Structure of the Nonuniformities of the Solar Supercorona

PERIODICAL: Astronomicheskiy zhurnal, 1959, Vol 36, Nr 3, pp 544-546 (USSR)

ABSTRACT: This is a report on the observations carried out on June 13, 1957 in the radiophysical station of the FIAN in the Serpukov. The base of the observations was the scattering of radio waves emitted by the Crab nebula at the nonuniformities of the solar supercorona, when the latter covers the Crab nebula. The distribution of intensity of the emitted and scattered waves leads to the statement that the nonuniformities of the supercorona have the form of oblong streams running nearly radially. It is possible that the nonuniformities run along the lines of force of the magnetic field of the Sun. On the published results it was reported partly in December 1957 at the extended full assembly for radio astronomy, and completely on May 15, 1958 in the colloquy of the

Card 1/2

On the Question of the Structure of the Nonuniformities of the Solar Supercorona

SOV/33-36-3-22/29

sector of radio astronomy of the Physical Institute imeni P.N.Lebedev.

There is 1 figure and 1 Soviet reference.

ASSOCIATION: Fizicheskiy institut imeni P.N.Lebedeva Akademii nauk SSSR (Physical Institute imeni P.N.Lebedev of the AS USSR)

SUBMITTED: August 15, 1958

Card 2/2

PANOVKIN, B.N.

Occlusion of the Crab nebula by the supercorona of the sun.
Priroda 48 no.6:125 Je '59. (MIRA 12:5)

1.Fizicheskiy institut im. P.N. Lebedeva AN SSSR, Moskva.
(Nebulae) (Sun--Corona)

S/030/61/000/002/006/011
B105/B206

AUTHOR: Panovkin, B.N.

TITLE: Plenary session of the Commission on Radioastronomy

PERIODICAL: Vestnik Akademii nauk SSSR, no. 2, 1961, 106 - 107

TEXT: An enlarged plenary session of the Komissiya po radioastronomii Astronomicheskogo soveta (Commission on Radioastronomy of the Council of Astronomy) and the Radiosovet Akademii nauk SSSR (Radio Council of the Academy of Sciences USSR) was held in Moscow from November 22 to 28, 1960. It was attended by delegates from observatories, scientific research institutes, universities and other organizations conducting research in this field. The reports and communications gave an idea of the activity of the radioastronomical institutes in the Soviet Union during the three years since the previous plenary session. The following reports were delivered: A.Ye. Salomonovich, on the erection of the 22-meter radiotelescope of the Okskaya stantsiya (Oka Station) of the Fizicheskiy institut im. P.N. Lebedeva (Physics Institute imeni P.N. Lebedev). Its

Card 1/3

Plenary session of the ...

reflector has a diameter of 22 meters and is built with such a precision that it is possible to receive radio radiation of celestial bodies on short wavelengths of 1 cm (V.V. Vitkevich); S.E. Khaykin, Yu.N. Pariyskiy and N.L. Kaydanovskiy discussed the properties of radiotelescopes with reflectors of variable profile. The stress of present problems of solar physics is on the investigation of corona-condensations, the splashes and ejections of solar radio radiation, the correlation of increased solar radio radiation with optically active phenomena. These problems were investigated at the Glavnaya astronomicheskaya observatoriya Akademii nauk SSSR (Main Astronomic Observatory of the Academy of Sciences USSR). V.L. Ginzburg and V.V. Zheleznyakov reported on the development of sporadic solar radio radiation; V.V. Vitkevich, on the study of upper layers of the solar atmosphere, the solar supercorona; I.S. Shklovskiy, on radio radiation of the galaxies as well as discrete sources. Further reports were delivered on discrete sources of radio radiation, which were investigated by means of the 22-m radiotelescope of the Physics Institute, on the polarization of the crab-nebula radio radiation, which was discovered on the wave $\lambda = 20$ cm, on observations of a galactic area in the line of neutral hydrogen on the wave $\lambda = 21$ cm. A great contribution was made by

Card 2/3

PANOVKIN, B.N.

Development of radio-astronomic research in Latvia; in the Scientific Council for the Complex Problem of Radio Astronomy. Vest. AN SSSR 34 no.10:111-112 O '64.

(MIRA 17:11)

L 17892-65 EEO/FSF(h)/EWT(1)/EWG(v)/EEC-4/EEC(t)/T/EWA(h) Pe-5/Pn-4/Pac-4/Pae-2/ [illegible] AFWL/AEDC(b)/SSD(a)/ESD/AS(mp)-5/AFETR/AFTC(b)/RAEM(a)/RAEM(c)/ESD(c)/ [illegible]

ACCESSION NR: [illegible] S/0030/64/000/010/0111/0112

AUTHOR: [illegible]

TITLE: Development of radio-astronomical studies in Latvia. [Scientific Council on the Complex Problem of Radio Astronomy]

SOURCE: AN SSSR. Vestnik, no. 10, 1964, 111-112

TOPIC TAGS: interferometer, radio interferometer, radio telescope, parabolic antenna

ABSTRACT: A session of the Scientific Council on the Complex Problems of Radio Astronomy was held in Riga on June 29 - July 2. Among those attending were 60 representatives of the larger radio-astronomical establishments of the Soviet Union, including Ya. Ya. Ikaunieks, head of the Astrophysical Laboratory, AN Latviyskaya SSR, who reported on the work of the laboratory in developing a unique radio interferometer for the decimeter wavelengths. It will be designed as a parabolic antenna 30 m in diameter and in its final design configuration will be cross-shaped, 2 x 2 km in size, and have over 5000-m^2 total antenna area. It is intended for investigations of the fine

Card 1/2

L 17939-65
ACCESSION NR: AP4049196

structure of the thermal radio emissions from interstellar hydrogen, as well as for studies of local radio-emission sources on the surface of the Sun. It is expected that the first arm of the interferometer (east-west) will be completed in 1966. A. E. Balklav reported on theoretical investigations by the laboratory on radio-brightness distribution of cosmic radio-emission sources and on the development of equipment for the automatic processing and reduction of the observation data. Another report dealt with the coherent and incoherent mechanisms of solar radio-emission generation and the investigations of the "perturbed" Sun.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: AA, DC, EC

NO REF SOV: 000 OTHER: 000

Card 2/2

NEYSHIL'D, V.G.; PANOVKIN, B.N., inzh.; KOKURIN, Yu.L., kand.fiziko-matem. nauk, otv.red.; NOVICHKOVA, N.D., tekhn.red.

[Radio astronomy: annotated bibliographical index of Russian and foreign literature, 1932-1958] Radioastronomiia; annotirovannyi bibliograficheskii ukazatel' otechestvennoi i inostrannoi literatury 1932-1958 gg. Moskva, 1960. 215 p. (MIRA 13:7)

1. Akademiya nauk SSSR. Sektor seti spetsial'nykh bibliotek.
2. Glavnyy bibliograf Biblioteki Fizicheskogo instituta im. P.N.Lebedeva AN SSSR (for Neyshil'd).
(Bibliography--Radio astronomy)

PANOVKIN, Boris Nikolayevich; FAYNBOYM, I.B., red.; RAKITIN, I.T., tekhn. red.

[Radio signals from outer space] Radiosignaly Vselennoi. Moskva, Izd-vo "Znanie," 1963. 55 p. (Novoe v zhizni, nauke, tekhnike. IX Seriia: Fizika i khimiia, no.14) (MIRA 16:8)

(Radio astronomy)

L 4950-66 EWT(1)/EWP(e)/EWT(m)/EWP(i)/T/EWP(b)/EWA(h) IJP(c) AT/WH

ACC NR: AP5025718 SOURCE CODE: UR/0286/65/000/018/0071/0071

AUTHORS: Feynberg, Ye. A.; Panovkina, V. I.

ORG: none

TITLE: Glass. Class 32, No. 174780 [announced by State Scientific Research Institute for Electrovacuum Glass (Gosudarstvennyy nauchno-issledovatel'skiy institut elektrovakuumnogo stekla)]

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 18, 1965, 71

TOPIC TAGS: glass, semiconductive glass, conductivity glass

ABSTRACT: This Author Certificate describes a glass obtained on the basis of SiO_2, MnO, Al_2O_3, and BaO. To insure that objects made from this glass have a surface conductivity of $10^4 - 10^9$ ohm/cm^2, the glass is heated in an oxidizing atmosphere. The composition of the glass in cation percent is: SiO_2 40-60; MnO not exceeding 40; Al_2O_3 not exceeding 20; BaO not exceeding 20; CuO 5-15; PbO not exceeding 35; and R_2O not exceeding 10.

SUB CODE: MT / SUBM DATE: 06Feb64

Card 1/1 UDC: 661.117.9

0901 1588

GOL'DIN, V., insh.; PANOVKO, B., insh.

Some problems in building roads within blocks in areas of mass construction. Na stroi.Mosk. 2 no.11:31-32 N '59. (MIRA 13:3)
(Road construction)

GOL'DIN, V., inzh.; PANOVKO, B., inzh.

Using bituminous emulsions in treating concrete pavements. Na stroi. Mosk. 2 no.6:23 Je '59. (MIRA 12:8)
(Pavements, Concrete) (Bituminous materials)

PANOVKO, V.M., inzh.

Evaluation and choice of electrodes for the hard facing of dies. Svar. proizv. no.3:25-28 Mr '63. (MIRA 16:3)

1. Moskovskiy opytnyy svarochnyy zavod.
(Hard facing--Equipment and supplies)
(Dies (Metalworking))

PANOVKO, V.M., inzh.

All-Union Conference on the Hard Facing of Dies for Hot and Cold Stamping. Svar. proizv. no.3:44-45 Mr '63. (MIRA 16:3)
(Hard facing--Congresses)

S/135/63/000/002/005/015
A006/A101

AUTHOR: Panovko, V. M., Engineer

TITLE: On the method of alloying type P 18 (R18) built-up metal with carbon and tungsten

PERIODICAL: Svarochnoye proizvodstvo, no. 2, 1963, 11 - 14

TEXT: It has been proposed in 1959 - 1960 to use cast tungsten carbide (relite) as a tungsten-containing component of electrode coatings, whose advantage over ferrotungsten is a high and stable tungsten amount. To determine the effect of introducing carbon and tungsten on the properties of built-up metal (combined addition in the form of WC and W_2C (relite) and, separately, in the form of ferrotungsten and graphite), comparison tests were performed with built-up metal obtained by different methods. The built-up metal was evaluated from results of metallographical analysis, studies of the effect of heat treatment upon hardness and structure, and from comparing red-hardness and microhardness. The metal was investigated after building-up, annealing, quenching, and tempering. The following results were obtained. In separate introduction of carbon

Card 1/2

On the method of alloying type...

and tungsten to the built-up metal of the high-speed steel type, the amount of ledeburite carbide eutectics is considerably higher than in combined addition in the form of relite. In the latter case, the solid solution matrix is lesser alloyed; considerable amounts of martensite are formed in the metal structure directly after hardfacing; as a result, heat resistance of the built-up metal is reduced and proneness to overheating increases during heating for quenching. To increase the heat resistance of the metal in the given case it is recommended to perform complete heat treatment; this will cause partial dissolving of carbide eutectics and the solid solution matrix will be alloyed to a higher degree. The granulation of relite, used in the charge of electrode coatings, assures the formation of built-up metal without undissolved relite particles. As a result, the heat resistance of the metal increases, the optimum temperature range of heating for quenching is extended, the cutting ability of the built-up metal after annealing is facilitated and the full heat treatment cycle can be avoided if necessary. The described advantages in the structure and some mechanical properties of the built-up metal make it possible to replace ferrotungsten for electrodes by relite, raising the operational indices of the built-up metal. There are 3 tables and 7 figures.

ASSOCIATION: Moskovskiy opytnyy svarochnyy zavod (Moscow Experimental Welding Plant.)

Card 2/2

S/135/63/000/003/011/011
A006/A101

AUTHOR: Panovko, V. M., Engineer

TITLE: All-Union Conference on the hardfacing of dies for hot and cold press-forming

PERIODICAL: Svarochnoye proizvodstvo, no. 3, 1963, 44 - 45

TEXT: The First All-Union Scientific-Technical Conference on hardfacing of dies was held at Volgograd from November 27 - 29, 1962. The Conference heard the following reports: N. T. Prosvirov (VNIIPTMASh) on "Operational conditions and the type of forging dies"; L. A. Pozdnyakova (ENIKMASh) on "Problems of the durability of dies and press-forming steels"; V. A. Popov, ENIKMASh, on some structural peculiarities of carbide tools for cold extrusion and upsetting; I. I. Frumin, B. V. Danil'chenko (Institute of Electric Welding imeni Ye. O. Paton) on "Electric-slag hardfacing of some dies"; L. Kolomiets (IES imeni Ye. O. Paton) on "Reconditioning of dies by electric-slag hardfacing"; V. A. Timchenko (IES imeni Ye. O. Paton) on "A machine with program control for automatic hardfacing of forging dies"; Reports on manual arc-hardfacing of dies were delivered

Card 1/2

S/135/63/000/003/006/011
A006/A101

AUTHOR: Panovko, V. M., Engineer

TITLE: Evaluation and selection of electrodes for the hardfacing of dies

PERIODICAL: Svarochnoye proizvodstvo, no. 3, 1963, 25 - 28

TEXT: Electrodes of various grades were investigated in order to select the suitable ones for the hardfacing of dies. The investigations were made with Ст.3 (St.3) steel plates. The fourth built-up layer was tested in order to exclude the effect of the base metal. The basic indices for selecting the electrodes are the hardness and heat resistance of the built-up metal and the possibility of performing the complete heat treatment cycle without impairing the quality of the base metal. The electrode coatings should not contain scarce materials in order to permit their industrial use. Large-scale production requires a stable quality of the built-up metal. The Moscow Experimental Welding plant recommends ЭН-60 М (EN-60M) electrodes for the hardfacing of dies since they meet best the aforementioned requirements, show satisfactory welding properties, and low crack-sensitivity. They may be used to hardface dies operating at up

Card 1/2

Evaluation and selection of...

to 400°C. Grade ОЗИ-1 (OZI-1) electrodes are recommended for hardfacing broaching and calibrating dies, operating at elevated temperatures. The hardness and heat resistance of the metal built up with these electrodes, raises the resistance of the hardfaced tools by a factor of 8 - 15. There are 3 tables and 2 figures.

ASSOCIATION: Moskovskiy opytnyy svarochnyy zavod (Moscow Experimental Welding Plant)

Card 2/2

PANOVKO, V.M., inzh.

Some properties of the metal in thin layer build-up welding.
Svar. proizv. no.1:26-28 Ja '65. (MIRA 18:3

PANOVKO, V.M., inzh.

Method of alloying deposited, type R18 metal, by carbon and tungsten. Svar. proizv. no.2:11-14 F '63. (MIRA 16:2)

1. Moskovskiy opytnyy svarochnyy zavod.
(Electroforming) (Iron-tungsten-chromium alloys)

PANOVKO, V.M., inzh.

Electrodes for the build-up welding of hammer and upset dies. (MIRA 12:8)
Stan. i instr. no.6:15-17 Je '59.

1. Nachalnik otdeleniya [illegible].

PANOVKO, Ya. (Riga); STRAKHOV, G. (Riga)

1. Structural damping in threaded joints. Vestis Latv ak no.12: 15-26 '59. (EEAI 9:11)

1. Akademiya nauk Latviyskoy SSR, Institut mashinovedeniya.
(Damping (Mechanics))

PANOVKO, Ya. Ag., jt. au.

Dzhanelidze, G. Yu. The statics of elastic thin-walled rods. Leningrad, Gos. izd-vo tekhniko-teoret. lit-ry, 1948. 208 p. (Sovremennye problemy mekhaniki) (50-35037)

QA935.D9

PANOVKO, YA. G. (PROF.) PROKOF'YEV, DOCENT V. N.

USSR (600)

Automobiles - Transmission Devices

Forced fluctation of automobile systems having a hydrodynamic coupling. Prof Ya. G Panovko, Docent V.N. Prokof'yev. (Trudy) NAMI No 48, 1947.

9. Monthly List of Russian Accessions, Library of Congress, September 1953, Uncl.
2

PANOVKO, Ya. G.

DZHANELIDZE, G. IU., and Ya. G. PANOVKO.

Statika uprugikh tonkostennykh sterzhnei. Leningrade, Gostekhizdat, 1948. 208 p., diagrs. (Sovremennye problemy mekhaniki)

Bibliography: p. 207-208.

Title tr.: Statics of elastic thin-walled rods.

QA935.D9

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress, 1955.

Panovko, Ya. G.

PANOVKO, YA. G., and S. N. KAN.

Elementy stroitel'noi mekhaniki tonkostennykh konstruktsii; pod red. A. M. Cheremukhina. Dopushcheno v kachestve ucheb. posobiia dlia aviatsionnykh vuzov. Moskva, Glav. red. aviats. lit-ry, 1949. 126 p., diagrs.

Title tr.: Elements of construction mechanics of thin-walled structures. Approved as a textbook for schools of advanced aeronautical studies.

TL671.2.K3

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress, 1955.

ROSTOVTSEV, G.G.; PANOVKO, Ya.G., POPOV, Ye.P., redaktor; KAN, S.N., retsenzent; PAVLOVA, T.P., tekhnicheskiy redaktor.

[Structural mechanics of the airplane] Stroitel'naia mekhanika samoleta. Vol. 1. [General course] Obshchii kurs. Leningrad, Leningradskaia Krasnoznamennaia voenno-vozdushnaia inzhenernaia akademiia. 1950. 437 p. [Microfilm] (MLRA 8:1)

(Airplanes--Design and construction)

Panovko, Ya. G.

Elementy Stroitel'noy Mekhaniki Tonkostennykh Konstruktsiy (Elements of Structure Mechanics in Thin-Walled Construction) Izd. 2., Perer. I Dop., By S. N. Kan and Ya. G. Panovko. Moskva, Oborongiz, 1952.
161 P. Diagrs., Graphs, Tadles.

SO: N/5
666.2
.KI
1952

PANOVKO, Ya. G.

Mathematical Reviews
Vol. 14 No. 10
November 1953
Mechanics

Panovko, Ya. G. A method of direct linearization in non-linear problems of the theory of elastic vibrations. Akad. Nauk SSSR. Inzenernyi Sbornik 13, 113-122 (1952). (Russian)

The author proposes to find the frequency of the free vibrations, of constant amplitude A, given by the equation $y'' + f(y)=0$, where $f(y)$ is an odd function, by replacing $f(y)$ by ky, where k is a constant which minimizes $\int_{-A}^{A} \{f(y)-ky\}^2 dy$, the integral of the squared moment of the deviation of $f(y)$ from ky. He claims that the resulting first approximation to the frequency is more accurate than the first approximations by the method of Galerkin or Krylov-Bogolyubov. This claim is justified by numerical data but no mathematical proof is offered. The idea is also extended to forced vibrations, system with several degrees of freedom, and the case of asymmetric restoring force $f(y)$.

L. M. Milne-Thomson (Greenwich).

PANOVKO, YA. G.

124-58-9-10559

Translation from: Referativnyy zhurnal, Mekhanika, 1958 Nr 9, p 159 (USSR)

AUTHORS: Panovko, Ya. G., Gol'tsev, D. I., Danilevskiy, V. V., Kolesnichenko, V. O., Khrichikov, V. K.

TITLE: On Estimates of the Strength of Press Fittings (Ob otsenkakh prochnosti pressovykh soyedineniy)

PERIODICAL: Izv. AN LatvSSR, 1953, Nr 12, pp 103-110

ABSTRACT: An examination of the problem of estimating the strength of press fittings relative to the attachment of wheels to axles for railroad rolling stock. It is shown that in order to obtain an estimate of the strength of a press fitting it is not sufficient to have only a press-fitting diagram (i.e. the relationship between the fitting force and the relative displacement of the axle against the hub). The authors offer new recommendations relative to the estimation of the strength of press fittings and arrange them in two groups: estimates regarding static conditions and estimates in which dynamic loads are taken into account. In examining the first group of estimates the authors recommend that not only the force required to make a press fit be taken into account, but also the ratio of the force required to pull the hub off the axle as

Card 1/2

124-58-9-10559

On Estimates of the Strength of Press Fittings

against the force required to make the press fit. They also propose that standardization be applied not to the force required to make the press fit, but to the effective negative allowance (after removal of any existing crests or burrs). Relative to the second group of estimates the authors denote the inadequacy of investigations available, and they point out that investigations performed to date fail to reflect realistic operating conditions of press-fitted pairs. They propose an equipment for dynamic testing whereby concurrent longitudinal and transverse loads could be taken into account. The authors indicate also that a "wear" curve is indispensable, and that a "wear limit" for press fitted joints should be established on that curve. The list of literature references does not fully reflect the state of the art.

N D Tarabasov

1. Railway ear wheels--Attachment 2. Mechanics--Theory

Card 2/2

PANOVKO, Ya. G.

"Laws of Vibrations in Elastic Systems With Hysteresis".
Vopr. dinamiki i Dinamich. prochnosti, No II. Riga, Izd-voAN LatvSSR, pp 91-98,1954

The author repoduces the law of amplitude danping of free vibrations of an elastic system with one degree of freedom and hysteresis. Replying to the critical remarks of an I. I. Kandaurov ("Calculation of Hysteresis Losses in Designing Structures for Vibrations"), who proposes his own equation for deducing the law of damping, the author objects to this equation, finding in it physical absurdities (in particular, inconsistency of dimensions). (RZhMekh, No 8, 1955)

SO: Sum No 812, 6 Feb 1956

Name : PANOVKO, Ya. G.

Remarks : Engineer G. Molyukov writes in a review of a manual on aircraft construction that O. N. Rozanov, A. S. Bedunkevich, V. Ya. Krylov, Ya. G. Panovko and G. G. Rostovtsev are the authors of a book entitled "Special Features of Jet Aircraft Construction".

Source : P: Vestnik Vozdushnogo Flota, No. 3, March 1954, pp. 80-82

FD-1118

Papov N. Ya. G

USSR/Engineering / Bibliography

Card 1/1 Pub. 41-12/13

Author : Volotin, V. V. and Panovko, Ya. G.

Title : Review of the book by V. M. Muchnikov, "Some Methods for Calculation of Vibrations of Elastic Systems Under a Movable Load", Gosstroyizdat (State Construction Publishing House), 1953

Periodical : Izv. AN SSSR. Otd. tekh. nauk 5, 153-156, May 1954

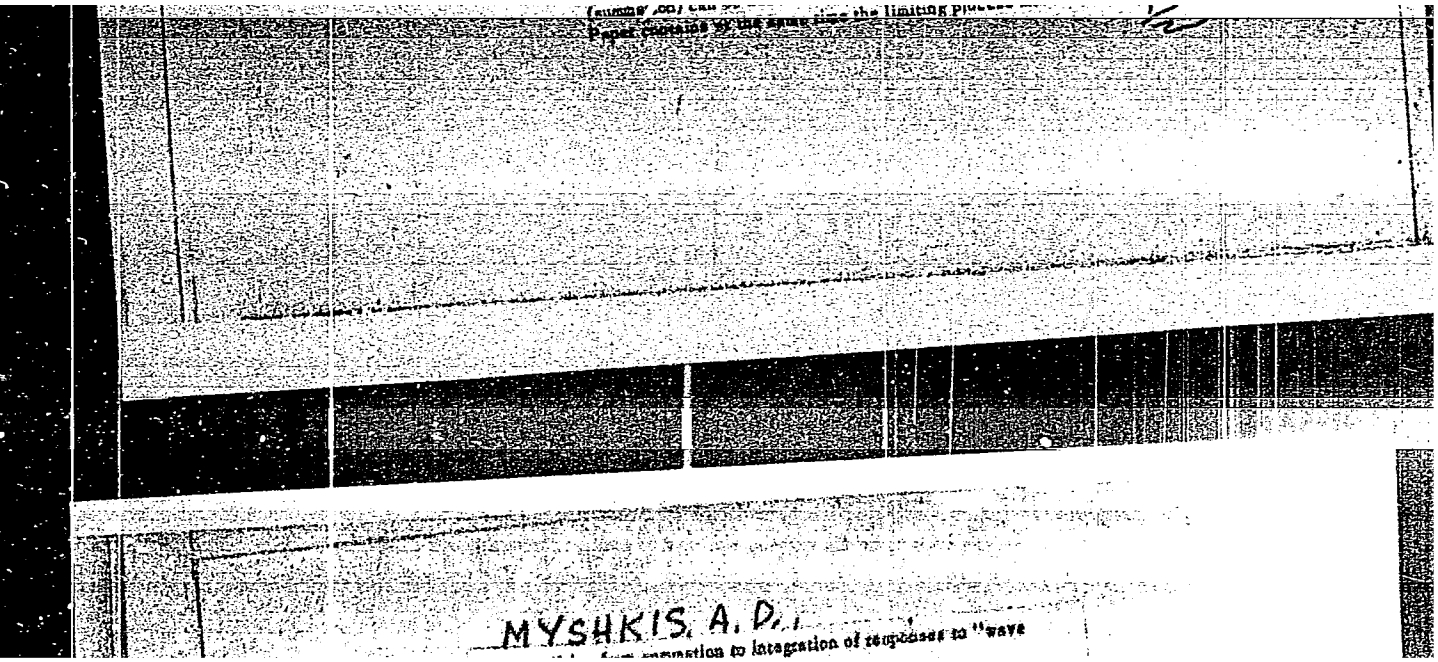
Abstract : Review above-mentioned book. State it adds nothing to the literature in this field and that it was a mistake for the publisher to release it. Eleven references.

Institution :

Submitted : May 29, 1954

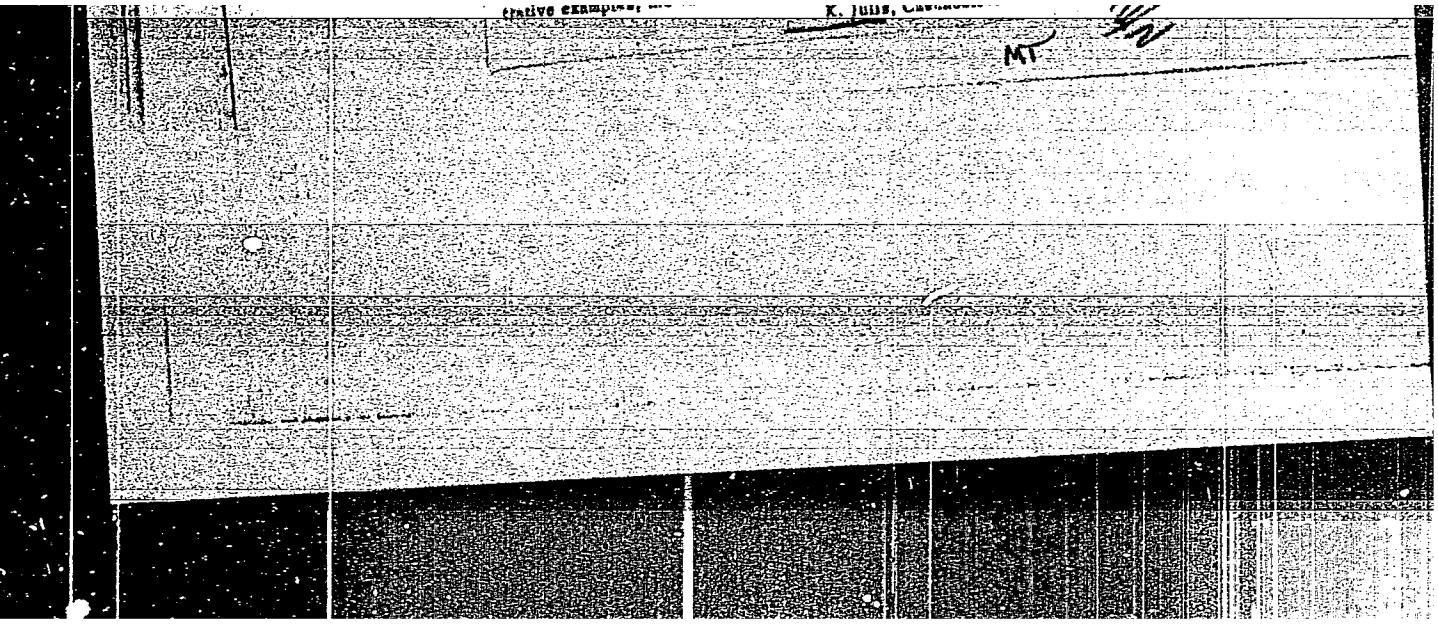
PANOVKO, Ya.G.

Critical force of compressed columns in the inelastic range. Inzh. sbor. 20:160-163 '54. (MIRA 8:7)
(Columns) (Statics)



MYSHKIS, A. D.

...integration to integration of responses to "wave



PANOVKO, Ya.G.

Vibration of elastic systems accounting for energy dissipation in the material." G.S.Pisarenko. Reviewed by Ia.G.Panovko. Prikl.mekh.2 no.2: 227-229 '56. (MLRA 9:10)
(Vibrations) (Elasticity) (Pisarenko, G.S.)

other technological processes are considered. Some of these problems are connected with the latest technological developments which include

Card 1/12

new vibration problems: frictional autovibrations, vibrations in metalcutting, automatic balancing of rotors, etc. Computational methods are stated and compared, and as a result, some traditional concepts are declared obsolete, e.g., application of Fourier's series to the analysis of forces. The text is illustrated with numerous calculations. The book may serve as a guide to literature in the field and as an introduction to specialized literature concerned with complex problems in the theory of vibrations. Soviet contributions in the field of the theory of elastic vibrations are mentioned along with developments of new problems, derivation of particular and generalized solutions, etc. There are 178 figures, 7 tables, 802 equations, and 209 references of which 152 Soviet, 24 German, 15 English, 2 Czech, 1 Polish, and 1 Japanese.

TABLE OF CONTENTS:

321

Principles of Applied Theory of Elastic Vibrations

Card 3/12

Card 6/12

Card 9/12

Card 10/12

Card 11/12

AVAILABLE: Library of Congress

EW/mal
June 3, 1958

Card 12/12

SOV/24-58-10-33/34

AUTHOR: Panovko, Ya. G.

TITLE: A Conference on Elastic Vibrations at the Institute of Mechanical Engineering of the Academy of Sciences of the Latvian SSR (Soveshchaniye po voprosam uprugikh kolebaniy v Institute mashinovedeniya Akademii nauk Latviyskoy SSR)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, 1958, Nr 10, pp 158-159 (USSR)

ABSTRACT: This Conference took place on June 11-15, 1958, in Riga. Altogether over 70 people took part in the conference (apart from those normally based at Riga). Eleven papers were read: 1) "The effect of vibration on systems with dry friction", by I. I. Blekhman and G. Yu. Dzhanelidze (Leningrad), 2) Two papers on dynamic problems in the nonlinear theory of plates and the shells by V. V. Bolotin and A. S. Vol'mir (Moscow), 3) "A qualitative study of the form and frequencies of natural vibrations of thin elastic shells", by A. L. Gol'denveyzer (Moscow), 4) "Some problems in connection with vibrations of elastic rods in the case of large displacements", by Yu. S. Shkenev (Moscow), 5) "Coupled vibrations of vanes and discs in turbines" and

Card 1/2

SOV/24-58-10-33/34

A Conference on Elastic Vibrations at the Institute of Mechanical Engineering of the Academy of Sciences of the Latvian SSR

"Passage through resonance of a linear system with non-linearly varying frequency", by A. P. Filippov (Khar'kov),
6) "Some problems in the dynamics of an ideally elastic stretched thread", by V. A. Svetlitskiy (Moscow),
7) "On the similarity of dynamic processes in solid bodies", by A. G. Nazarov (Yerevan),
8) "The problem of constructional hysteresis", by Ya. G. Panovko (Riga),
9) "Constructional hysteresis in resin-metallic shock absorbers", by G. I. Strakhov (Riga).
The conference was closed with a speech by M. M. Filonenko-Borodich (Moscow).

Card 2/2

TIMOSHENKO, Stepan Prokof'yevich, prof.; YANG, D.Kh. [Young, D.H.], prof.; PANOVKO, Ya.G. [translator]; KAMENETSKIY, S.A., red.; GAVRILOV, S.S., tekhn.red.

[Vibration problems in engineering] Kolebaniia v inzhenernom dele. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1959. 439 p. (MIRA 12:10)

(Vibration) (Mechanics, Applied)

PANOVKO, Ya G.

PHASE I BOOK EXPLOITATION SOV/3927

Akademiya nauk Latviyskoy SSR. Institut mashinovedeniya

Voprosy dinamiki i prochnosti; sbornik statey; vyp. VI (Problems of Dynamics and Strength; Collection of Articles, No. 6) Riga, Izd-vo AN Latviyskoy SSR, 1959. 159 p. Errata slip inserted. 1,500 copies printed.

Ed.: A. Vengranovich; Tech. Ed.: A. Klyavinya; Editorial Board: Ya.G. Panovko, Corresponding Member, Academy of Sciences Latviyskaya SSR, Professor, Doctor of Technical Sciences (Resp. Ed.); S.B. Aynbinder, Docent, Candidate of Technical Sciences; and N.G. Kalinin, Docent, Candidate of Technical Sciences.

PURPOSE: This book is intended for mechanical engineers and technical workers.

COVERAGE: The book presents 10 articles on problems related to shock absorbers, railroad cars, thin shelled bars, crane structures, automatic balancing, oscillations, and the performance of mechanical presses. The authors are technical or scientific workers at

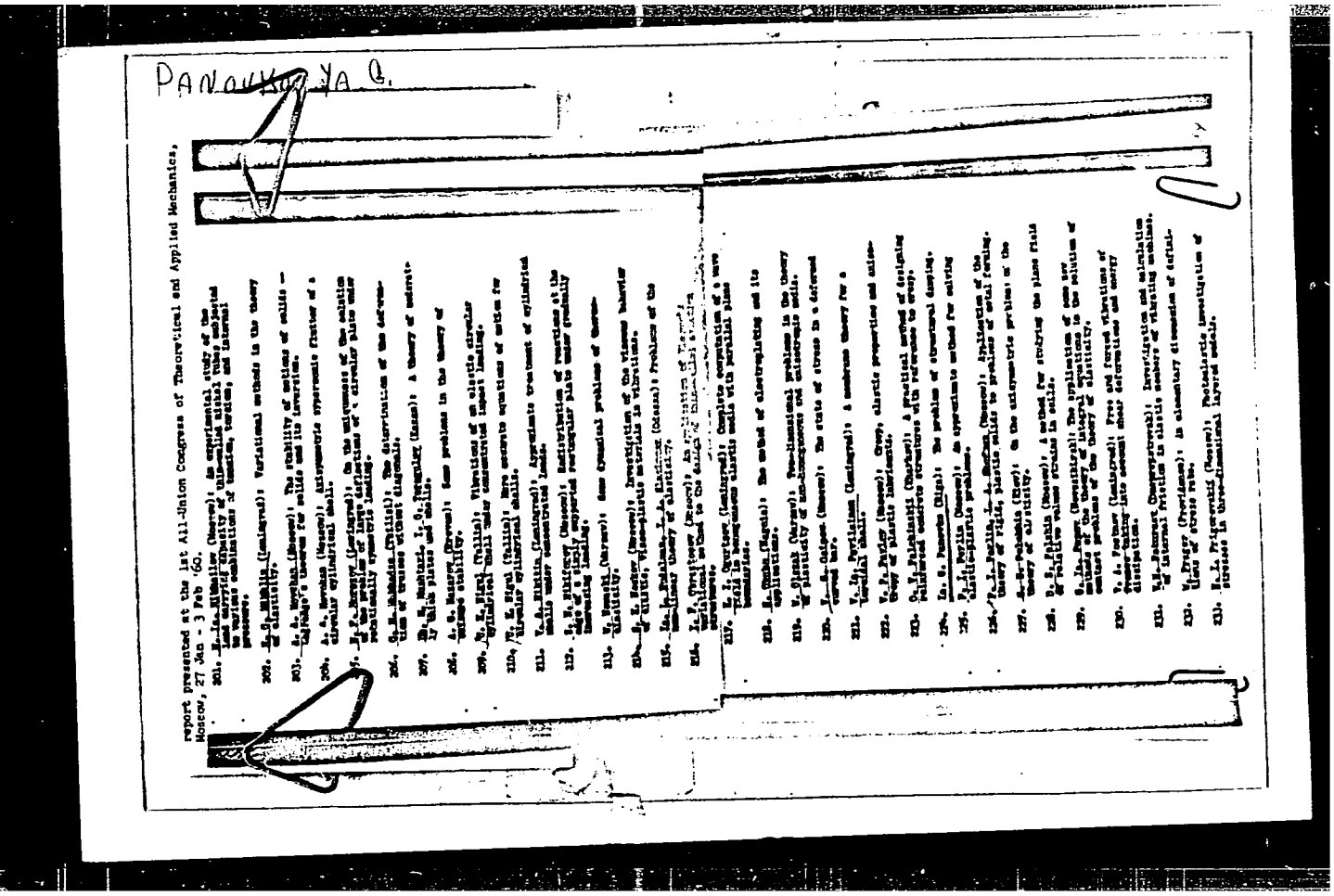
Card 1/3

Problems of Dynamics (Cont.)

the Institut mashinovedeniya Akademii nauk Latviyskoy SSR (Institute of Science of Machines of the Academy of Sciences Latviyskaya SSR), at the Rizhskiy politekhnicheskiy institut (Riga Polytechnic Institute), and at the Rizhskoye Krasnoznamennoye vysshee aviatsionnoye voyennoye uchilishche imeni Leninskogo komsomola (Riga Red Banner Higher Military Aviation School imeni Leninskiy Komsomol). No personalities are mentioned. References are given following each article except one.

TABLE OF CONTENTS:

AC/rm/JD
8-4-60



PANOVKO, YA. G.

report presented at the 1st All-Union Congress of Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb '60.

PHASE I BOOK EXPLOITATION SOV/5501

Kalinin, Nikolay Georgiyevich, Yuriy Alekseyevich Lebedev, Volga Ivanovna Lebedeva, Yakov Gilelevich Panovko, and German Ivanovich Strakhov

Konstruktsionnoye dempfirovaniye v nepodvizhnykh soyedineniyakh (Structural Damping in Stationary Joints) Riga, Izd-vo AN Latviyskoy SSR, 1960. 169 p. Errata slip inserted. 2,000 copies printed

Sponsoring Agency: Akademiya nauk Latviyskoy SSR. Institut avtomatiki i Mekhaniki

Ed. (Title page): Ya. G. Panovko, Corresponding Member, Academy of Sciences Latvian SSR, Professor, Doctor of Technical Sciences; Ed.: A. Vengranovich; Tech. Ed.: Ye. Piladze.

PURPOSE: This book is intended for research scientists and engineers concerned with structural mechanics.

Card 1/5

COVERAGE: The book presents the results of research and experiments in the field of structural damping. Experimental problems are discussed only to the extent necessary to support theoretical deductions. Sections 6 and 7 were written by N. G. Kalinin; Sections 12, 14, 15, 16, by Yu. A. Lebedev; Sections 8 and 9, by V. I. Lebedeva; Introduction, Sections 1, 13, 18, and the Conclusion, by Ya. G. Panovko; Sections 2 and 3, by G. I. Strakhov; Section 17 was written jointly by N. G. Kalinin and Yu. A. Lebedev; Ya. G. Panovko and G. I. Strakhov wrote Sections 4, 5, 10, 11, 19-21. There are 42 references: 35 Soviet, 6 English, and 1 German.

TABLE OF CONTENTS:

PART I. SYSTEMS WITH FRICTION COUPLINGS

Structural Damping in (Cont.)

AVAILABLE: Library of Congress

AC/dwm/bm
8-14-61

Card 5/5

PHASE I BOOK EXPLOITATION SOV/5548

Panovko, Yakov Gilelevich

Vnutrenneye treniye pri kolebaniyakh uprugikh sistem (Internal Friction During the Vibrations of Elastic Systems) Moscow, Fizmatgiz, 1960. 193 p. 6,000 copies printed.

Ed.: I. K. Snitko; Tech. Ed.: Ye. A. Yermakova.

PURPOSE: This book is intended for engineers and scientific workers interested in the vibration of structures.

COVERAGE: The book deals with internal friction in vibrating structures. It presents a concise account of the laws of internal friction and analytical methods of calculating corresponding differential equations. The author thanks G. Yu. Dzhanelidze and I. B. Barger. There are 102 references: 82 Soviet, 13 English, 5 German, and 2 Italian.

Card 1/7

S/179/60/000/006/036/036
E081/E135

AUTHOR: Panovko, Ya.G.

TITLE: Conference on Problems of Elastic Vibrations of Mechanical Systems

PERIODICAL: Izvestiya Akademii nauk ...SR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1960, No. 6, pp. 182-184

TEXT: The conference was held at the Institut mashinovedeniya AN Latviyskoy ...R (Institute of Science of Machines, AS Latvian SSR), Riga, on June 20-23, 1960. Brief summaries are given and authors and titles of papers are listed as follows.

V.A. Kudinov (Moscow). The Laws and Calculation of Damping in Non-tightened Joints in Complex Elastic Systems.
V.A. Kudinov (Moscow). Forced Vibrations in Moving Unions with Dry Friction.
V.I. Lebedeva (Riga). Damping Properties of Frictional Clutches.

Card 1/4

S/179/60/000/006/036/036
E081/E135

Conference on Problems of Elastic Vibrations of Mechanical Systems

V.P. Filekin (Kuybyshev). Constructional Damping of Vibrations in Flange and Seam Joints.
V.A. Grobov (Riga). Asymptotic Method of Investigating Non-linear Vibratory Systems with Gyroscopic Terms.
V.A. Grobov (Riga). The Calculation of Forced Vibrations in Multi-disc Rotors on Non-linear Elastic Supports.
I.I. Blekhman (Leningrad). Synchronization of Mechanical Vibrators by Means of Elastic Connections.
I.I. Blekhman (Leningrad). Integral Motional Stability Index of Some Non-linear Systems.
N.G. Bondar' (Dnepropetrovsk). Vibration of Oscillators with Variable Parameters.
K.A. Augstkali (Riga). Analysis of the Performance of Vibro-bunkers with a Spiral Chute.
A.V. Dabagyan (Khar'kov). Joint Electromechanical Vibrations of the Rotors of Electrical Generators in Non-symmetrical Regimes.
U.R. Upmanis (Riga). Solution of Dynamic Longitudinal Bending Problems by Means of an Electronic Analogue.

Card 2/4

S/179/60/000/006/036/036
E081/E135

Conference on Problems of Elastic Vibrations of Mechanical Systems

B.N. Kutukov (Moscow). Some Theorems of Matrix Calculus and Their Application to Vibration Theory.
B.N. Kutukov (Moscow). Determination of Intermediate Vibration Frequencies.
D.D. Akimov-Peretts (Leningrad). Experimental Investigation of the Damping of Steel Beams Under Transverse Shock.
L.A. Rastrigin (Moscow). Automatic Balancing of a Rotor by the Method of Random Search.
S.N. Kan (Khar'kov). Free Vibrations of a Bar Allowing for Deformation of the Cross-Section.
V.S. Kalinin (Leningrad). Non-linear Free Vibrations of Bars.
O.I. Terebushko (Riga). Stability of Closed Shells Subjected to the Action of Rapidly Changing Load.
A.B. Morgayevskiy (Dnepropetrovsk). A Non-linear Problem on the Critical Velocities and Vibrations of Beams and Arches with a Moving Load.

Card 3/ 4

S/179/60/000/006/036/036
E081/E135

Conference on Problems of Elastic Vibrations of Mechanical Systems

A.P. Filippov and Ye.G. Goloskokov (Khar'kov). Vibrations of a Beam on an Elastic Foundation Under the Action of a Moving Load.
M.D. Dol'berg (Khar'kov). Connections of Maximum Rigidity.
V.L. Biderman (Moscow). Theory of Elastic Shock in Solid Bodies.
V.S. Chuvikovskiy (Leningrad). Quasi-static Calculation of Elastic Systems Under the Action of Arbitrary Dynamic Loads.
V.A. Svetlitskiy (Moscow) spoke about the conditions of equilibrium of a hose and the tensile force as affected by liquid flow.
L.V. Nikitin and V.N. Kukudzhanov (Moscow). Influence of Strain Velocity in Longitudinal Impact.
A.P. Filippov and B.M. Lysenko (Khar'kov). Investigations on the Vibration Stability of Rotors.

Card 4/4

PANOVKO, Ya. G.

Achievements of the Soviet Latvian Scientists in the field of mechanics. In Russian. Vestis Latv ak no.7:173-178 '60.
(KRAI 10:7)

(Latvia—Mechanics)

PANOVKO, Ya.(Riga); STRAKHOV, G.(Riga)

Constructive damping in grooved joints. Vestis Latv ak no.8:39-46 '60. (EEAI 10:9)

1. Akademiya nauk Latviyskoy SSR, Institut mashinovedeniya.

(Machinery)

PANOVKO, Ya.G.

Conference on elastic vibrations of mechanical systems. Izv.AN SSSR.Otd.tekh.nauk.Mekh.i mashinostr. no.5:190-192 S-O '61. (MIRA 14:9)

(Vibration)

PANOVKO, Ya.G. (Riga)

Longitudinal elastoplastic bending of rods in statically indeterminate systems. Izv.AN SSSR.Otd.tekh.nauk.Mekh.i mashinostr. no.2:160-165 Mr-Ap '62. (MIRA 15:5)
(Elastic rods and wires)

S/681/62/000/008/001/004
E081/E141

AUTHORS: Panovko, Ya.G., and Strakhov, G.I.

TITLE: The approximate investigation of forced vibrations in elastic systems with constructional damping

SOURCE: Akademiya nauk Latviyskoy SSR. Institut avtomatiki i mekhaniki. Voprosy dinamiki i prochnosti. no.8, 1962. 5-12

TEXT: In many constructional schemes, the force-displacement loops are either of polygonal form, or are formed by two curved arcs. Loops of the first kind occur in constructions with "concentrated" friction, or in constructions in which slip under load occurs instantaneously in all regions of contact. Loops of the second kind occur in joints for which the slip region changes with changing load. The amplitude A of forced vibrations in a linear system with viscous friction is given by:

$$A = \frac{P_o}{\sqrt{\left[c(A) - m\omega^2\right]^2 + \frac{\psi^2(A)}{\pi^2 A^4}}} \qquad (1)$$

Card 1/2

PANOVKO, Ya. G.

"Review of applications of the method of direct linearization."

report submitted for 11th Intl Cong of Theoretical & Applied Mechanics & General Assembly, Munich, 30 Aug-5 Sep 64.

PANOVKO, Yakov Gilelevich; GUBANOVA, Iskra Ivanovna; SNITKO, I.K., red.

[Stability and vibrations of elastic systems; modern concepts, paradoxes, and errors] Ustoichivost' i kolebaniia uprugikh sistem; sovremennye kontseptsii, paradoksy i oshibki. Moskva, Izd-vo "Nauka," 1964. 336 p.
(MIRA 17:5)

PANOVKO, YA. G. (Riga)

"Modern conceptions of the elastic-plastic buckling of a column"

Report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow 29 Jan - 5 Feb 64.

YAVORSKIY, Boris Mikhaylovich; DETLAF, Andrey Antonovich.
Prinimali uchastiye: KHAZANOVICH, T.N.; PANOVKO, Ya.G.; GUROV, K.P., red.

[Physics handbook for engineers and students of institutes of higher learning] Spravochnik po fizike dlia inzhenerov i studentov vuzov. Izd. 2., ispr. Moskva, Nauka, 1964. 847 p. (MIRA 17:12)

DRAGOJEVIC, Bogosav; PANOVSKI, Bojan; SERAFIMOV, Koco

Traumatic hemorrhagic cyst of the spleen. Srpski arh. celok. lek. 88 no.6:719-722 Je '60.

1. Hirurska klinika Medicinskog fakulteta Univerziteta u Skopju. Direktor: prof. dr Bogosav Dragojevic.

(SPLEEN wds & inj) (CYSTS etiol)

PANOVSKI, J.; VELEV, V.

Echinococcosis of the pancreas. Acta chir.iugosl. 7(8) no.2:156-159 '60.

1. Hirurska klinika Medicinskog fakulteta u Skopju (Upravnik prof. dr B.Dragojevic)
(PANCREAS dis)
(ECHINOCOCCOSIS case reports)

PANOVSKI, J.

Gastroschisis (with report of 2 cases). Acta chir.iugosl. 7(8) '60.

1. Hirurska klinika Medicinskog fakulteta u Skopju (Upravnik prof. dr B.Dragojevic)
(ABDOMEN abnorm)

PANOVSKI, Jovan

A new case of invagination in purpura abdominalis. Srpski arh. celok. lek. 88 no.3:341-344 Mr '60.

1. Hirurska klinika Medicinskog fakulteta Univerziteta u Skopju. Direktor: prof. dr Bogosav Dragojevic.

(INTUSSUSCEPTION compl) (PURPURA compl)

PANOVSKIY, V. K.

PHASE I BOOK EXPLOITATION SOV/5982

International Conference on High-Energy Physics. 9th, Kiyev, 1959.

Devyataya mezhdunarodnaya konferentsiya po fizike vysokikh energiy, Kiyev 15-25 iyulya 1959 g. (Ninth International Conference on High-Energy Physics. Kiyev, July 15-25, 1959), Moscow, 1961. 739 p. 2,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Mezhdunarodnyy Soyuz chistoy i prikladnoy fiziki.

Contributors not mentioned.

PURPOSE: This book is intended for nuclear physicists.

COVERAGE: The collection contains 30 scientific articles presented at the 9th International Conference on High-Energy Physics, held in Kiyev from 15 to 25 July 1959. The articles presented relate mainly to the progress in nuclear physics achieved in 1959. Subjects discussed are the production of

Card 1/8 3

(29)

SOV/5982

Ninth International Conference (Cont.)

nucleons, their structure, weak and strong interactions, scattering, and their decay. No personalities are mentioned. References accompany individual articles.

TABLE OF CONTENTS:

Card 2/8 3

Ninth International Conference (Cont.) SOV/5982

Card 3/3

PANOW, A. A.

"Diaryles et leurs derives. Communication IX". Joffe, I. S., Kouznetzow et Panow, A. A. (p. 999)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1936, Vol. 6, No.7

PANOW, D. J.

"Metody numeryczne rozwiązywania równań różniczkowych cząstkowych" (Numeral methods of solving differential partial equations), by D. J. Panow. Reported in New Books (Nowe Ksiazki), No. 14, July 15, 1955

PANOYAN, G., inzh.

Automatic regulation of temperature conditions in polymerization. (MIRA 15:2)
Prom.Arm. 5 no.1:45-46 Ja '62.
(Polymerization) (Armenia--Temperature regulators)

S/081/62/000/024/032/052
B106/B186

AUTHOR: Panoyan, G.

TITLE: Automatic temperature control of polymerization conditions

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 24(II), 1962, 919, abstract 24P571 (Ayastani ardyunaberutyuny, no. 1, 1962, 51 - 52 [Arm.]; Prom-st' Armenii, no. 1, 1962, 45 - 46 [Russ.])

TEXT: A scheme of temperature control by using a two-speed electric motor is suggested for maintaining given temperature conditions during the entire emulsion polymerization process of chloroprene. This makes it possible to accelerate the polymerization process and saves having to supply the polymerizer with air. [Abstracter's note: Complete translation.]

Card 1/1

PANOZA, G.

Double-angle spondylodesis. Chir. narzad. ruchu ortop. Pol. 28 no.7:1069-1071 '63

1. Z Kliniki Neurochirurgii im. prof. Bagdasara w Bukareszcie (Kierownik: prof. dr. K. Arseni).

DENICKI,A. [Denitchi.A.]; PANOZA,G.; BROSZTIANU,V.[Brosteanu,G.] (Bukareszt).

Observations on injuries of the cervical spine. Chir. narzad. ruchu ortop. Pol. 28 no.7:809-812 '63