NIKOLAYEV, G.A., kand. tekhn. nauk

Complex of machines for the overall mechanization of agriculture from 1966 through 1970. Trakt. i sel'khozmash. no.7 (P:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sel'skokhozyaystvennogo mashinostroyeniya, Moskva.

NIKOLAYEV, G.A., prof., doktor tekhn. nauk, zasluzhennyy [illegible] tekhniki

Research work of the Moscow Higher Technical School during the last 40 years. Izv. vys. ucheb. zav.; mashinostr. no.9:3-9 '58. (MIRA 12:10)

1.Moskovskoye vysshaye tekhnicheskoye uchilishche im. Baumana.
(Moscow--Mechanics' institutes)

NIKOLAEV, GEORGII ALEKSANDROVICH

Deformatsii pri svarke konstruktsii. Moskva, AN SSSR, 1943. 151 p.

Deformations of structures during the welding process.

DLC: Unclass.

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

[redacted], V. A.

"Application of Electric Welding in Various Regions of the National Economy." Iz. Ak. Nauk SSSR, Otdel. Tekh. Nauk, No. 7-8, 1945. Presented 23 Apr 1945 by V.I. Nikitin, Academician.

Report U-1592, 6 Dec 1951

NIKOLAEV, Georgii Aleksandrovich.

The development of electric welding in future years Moskva, Izd-vo Akademii nauk SSSR, 1946. 123 p. (50-17076)

TK4660.N5

NIKOLAEV, GEORGII ALEKSANDROVICH and A. S. GELMAN

Svarnye konstruktsii i soedineniia. Moskva, Mashgiz, 1947. 502 p. diagrs.

Bibliography at end of each chapter.
Welded structures and joints.

DLC: TS227.N65

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

NIKOLAYEV, G.A.; PROKHOROV, N.N.

Stresses in the welding of construction elements. Izv.AN SSSR Otd.tekh. nauk no.3:307-318 '47. (MLRA 6:12)

1. Sektsiya po nauchnoy razrabotke problem elektrosvarki i elektrotermii Akademii nauk SSSR. 2. Predstavlena akademikom V.P.Nikitinym. (Strains and stresses) (Electric welding)

7

Welding of Metals, a Great Russian Invention. G. Nikolaev. Battelle Translation, 11 pages. From *Avtogennoe Delo* (Welding), Nov. 1947, p. 1 4.

Reviews development of welding from Petrov's study of the electric arc in 1802 and its application to welding in 1882 by N. N. Benardos. Claims great superiority for the U.S.S.R. in all phases of welding and implies that the Russians are far ahead of the rest of the world in both theory and application of welding.

METALLURGICAL LITERATURE CLASSIFICATION

NIKOLAYEV, G. A.

"Welding Metal, a Great Russian Discovery," Avtogen. Delo, No. 11, 1947.

Methods of Counteracting Internal Stresses in Welded Assemblies. G. A. Nikolaev. Welding, v. 15, Jan. 1947, p. 37. Abstracted from Avtogennoe Delo, no. 10, 1946.

Various methods were evaluated. Annealing at [illegible]°-600°C. was found to be the most effective method.

NIKOLAEV, Georgii Aleksandrovich.

Stresses in the welding process Moskva, Izd-vo Akademii nauk SSSR, 1948. 86 p.(52-33330)

TS227.N638

NIKOLAYEV, G. A.

"For the Accumulation of Excess Profits," Avtogen. Delo, No. 1, 1949.

NIKOLAEV, GEORGII ALEKSANDROVICH

O tekhnologichnosti svarnykh konstruktsii. (Vestn. Mash., 1949, no. 5, p. 17-23)

Technological justification of welded structures.

DLC: TJ4.V4

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

PA 50/49T37

NIKOLAYEV, G. A., Prof.

USSR/Engineering — Jun 49
Welding
Electrodes

"Work of the All-Union Scientific Engineering and Technical Society of Welders in 1948," Prof G. A. Nikolayev, Pres, Presidium of VNITOS, Dr Tech Sci; N. G. Nikitin, Acad-Secy VNITOS, 1 p

"Avtogen Delo" No 6

Lists accomplishments, including development of type TsM-7 electrode and publication of "Avtogennoye Delo" and "Informatsionnyy Byulleten'." Held five conferences in Moscow, Khar'kov, and Leningrad. Gave 107 lectures and seminars in

50/49T37

USSR/Engineering (Contd) — Jun 49

Gor'kiy, Rostov, Moscow, Khar'kov, and Leningrad. Lists points where improvement is needed.

50/49T37

NIKOLAYEV, G. A.

"Welding Technology during the Years of the Post-War Stalin Five-Year Plan," Avtogen. Delo, No. 11, 1949.

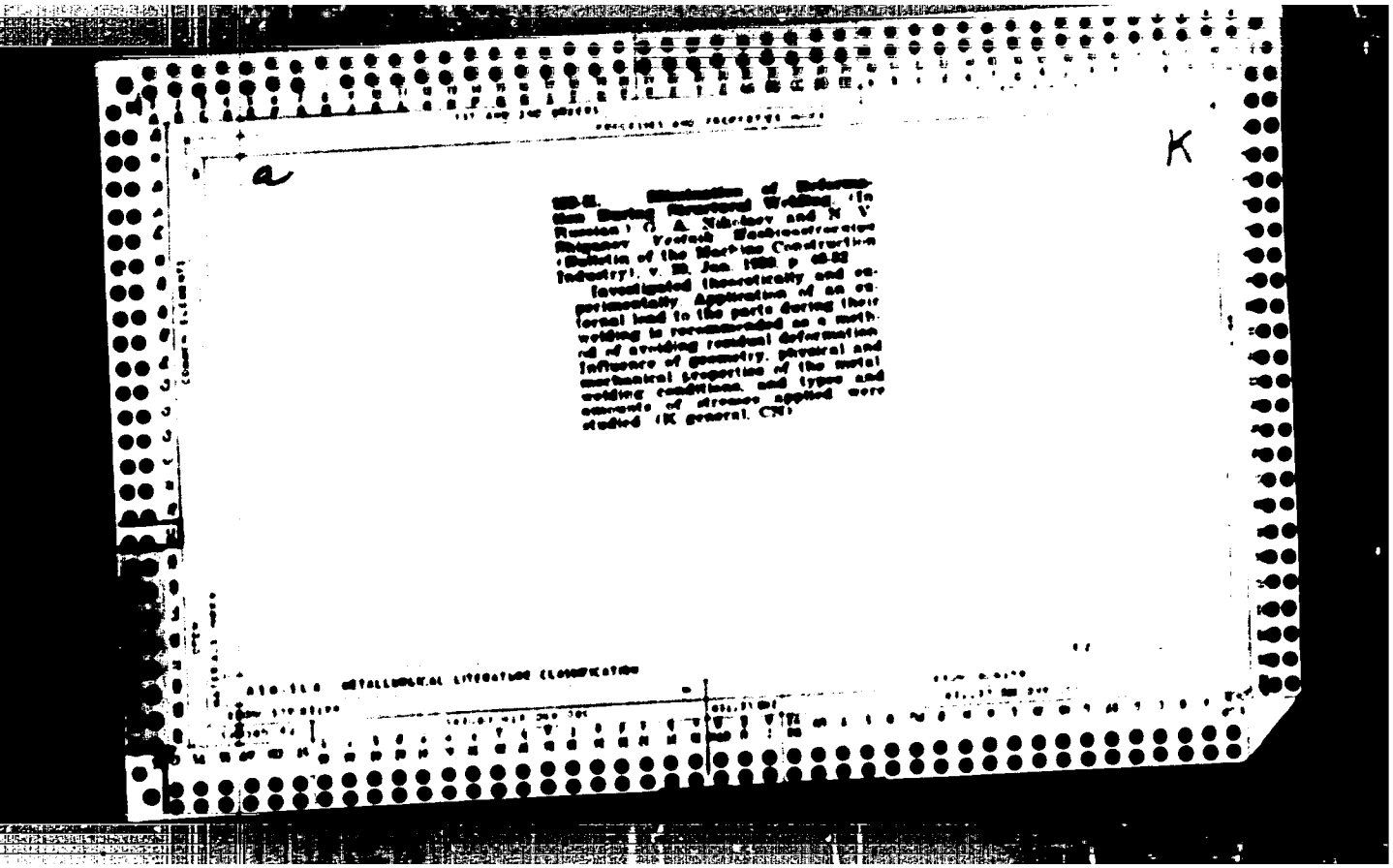
NIKOLAEV, GEORGII ALEKSANDROVICH and N. V. SHIGAREV.

Ustranenie deformatsii pri svarke konstruktsii. (Vestn. Mash., 1950, no. 1, p. 48-52

Includes bibliography.

Correction of deformation during the welding of structures.
DLC: TN4.V4

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.



NIKOLAEV, GEORGII ALEKSANDROVICH

Svarnye konstruktsii. Dop. v kachestve uchebn. posobia dlia mashinostroit. tekhnikumov po spetsial'nosti "Svarochnoe proizvodstvo." Moskva, Mashgiz, 1951. 347 p. diagrs.
Bibliography: p. 343.
Welded structures and joints.

DLC: TS227.N64

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

NIKOLAYEV, G.A. (Prof)

USSR/Engineering - Welding, Structural Analysis Nov 51

"On the Values of Permissible Stresses in Welded Joints of Metal Structures," Prof G. A. Nikolayev, Dr Tech Sci

"Avtogen Delo" No 11, pp 3,4

Discusses expediency of establishing permissible stresses in welded joints depending on permissible stresses in base metal and suggests revising GOST 960-46 to increase figures accepted by this std for permissible stresses in welded joints of

200T59

USSR/Engineering - Welding, Structural Analysis (Contd) Nov 51

steels St. Os, St.1, St.2 and St.3 (brands of general purpose structural carbon steel).

200T59

[redacted], B. A.

Technology

New problems on welding technology, Moskva, Mashgiz, 195?

Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

[illegible], Georgiy Aleksandrovich

NIKOLAYEV, Georgiy Aleksandrovich, professor doktor tekhnicheskikh nauk; [illegible], N.S., professor; PASTERNAK, N.A., inzhener, redaktor.

[Welded structural elements] Svarnye konstruktsii. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry, 1953. 536 p. (MLRA 7:7)

1. Chlen-korrespondent AN SSSR (for Streletskiy)
(Welding)

NIKOLAYEV, G. A.

USSR/ Engineering - Electric welding

Card 1/1 : Pub. 77 - 8/22

Authors : Nikolaev, G. A., Doctor of Tech. Sce., Professor

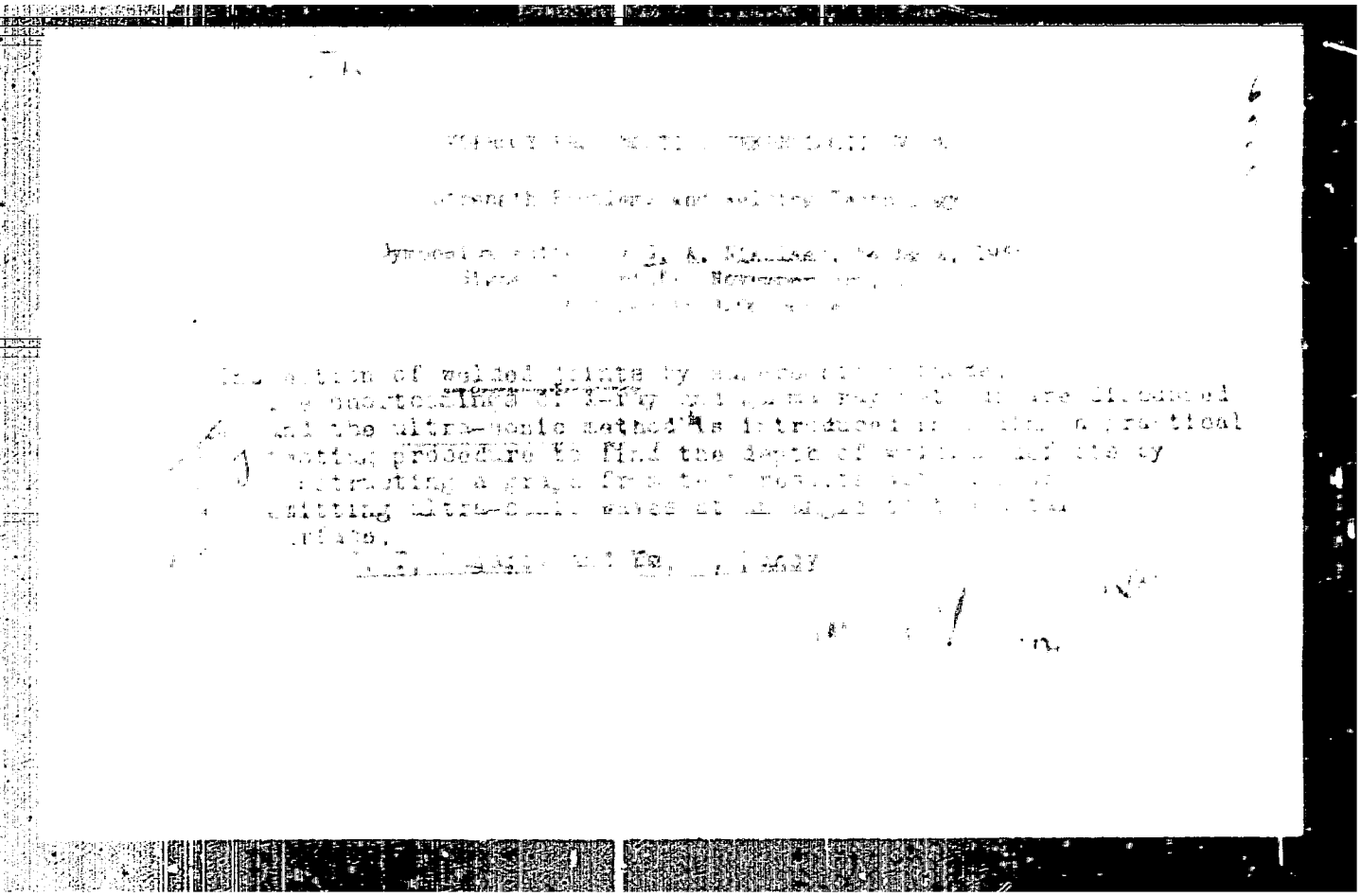
Title : Welded constructions

Periodical : Nauka i Zhizn' 8, 17-19, Aug 1954

Abstract : Advantages of electric welding and the achievements reached by Soviet engineers in metal constructions with the help of electric welding are described. Illustrations.

Institution : .....

Submitted : .....



NIKOLAYEV, G.A.; DUCHINSKIY, B.M., kandidat tekhnicheskikh nauk, retsenzent; [illegible] N.A., inzhener, redaktor; MODEL', B.I., tekhnicheskiy redaktor

[Welded structures] Svarnye konstruktsii. Izd. 2-oe. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1955. 344 p. (MLRA 9:8)
(Welding)

NIKOLAYEV, G.A., doktor tekhnicheskikh nauk, professor.

Formation of cracks in weldings. Svar.proizv. no.12:1-4 D '55.
(MLRA 9:2)

1.Moskovskoye Vyssheye tekhnicheskoye uchilishche imeni Baumana.
(Steel--Welding)

NIKOLAYEV, G.A., doktor tekhnicheskikh nauk, professor.

Scientific research carried on by the "Welding Practice" department. [Trudy] MVTU no.37:3-11 '55. (MLRA 9:6)
(Welding research)

SOV/137-57-11-21669

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 11, p 146 (USSR)

AUTHOR: Nikolayev, G.A.

TITLE: The Strength of Welded Structures (Prochnost' svarnykh konstruktsiy)

PERIODICAL: V sb.: Probl. dugovoy i kontakt. elektrosvarki. Kiyev-Moscow, Mashgiz, 1956, pp 29-38

ABSTRACT: The following basic aspects of the strength of welded structures (WS) are examined: Studies of the mechanical properties of welded connections (WC) depending on the nature of the parent metal and the welding techniques employed; development of measures intended to improve the mechanical properties of WC in structures (S); development of methods designed to increase the cracking resistance of the WC; experimental investigation of the stress distribution in WC and WS and investigation of the strength of WS subjected to various types of loads; studies dealing with stresses arising in the S during welding processes; an analysis of causes of the failure of S brought about by the action of these stresses; general deformations appearing during welding; and development of novel types of WS. A brief survey

Card 1/2

The Strength of Welded Structures

of scientific evaluation of experimental work is given together with a summary of practical solutions achieved with regard to improvement of the strength of the WS. A number of problems is outlined which should be solved in the near future.

I.V.

AID P - 4877

Subject : USSR/Engineering

Card 1/2 Pub. 107-a - 11/14

Author : Nikolayev, G. A.

Title : Welding engineering in Poland

Periodical : Svar. proizv., 4, 24-28, Ap 1956

Abstract : A brief report on proceedings at the Conference of Polish Mechanical Engineers (SIMP), held during 4 and 5 November 1955 in Warsaw with a short resume of the reports presented and the subjects discussed. The author provides a short outline of welding practice in various Polish industries, such as bridge construction, crane and shipbuilding, etc. He describes the set-up, the work done for the industries, and the school at the Polish Scientific-Research Welding Institute, founded some 10 years ago in Glivitsakh, which is located in the central industrial section of the country. Reference is also made to the Warsaw and Gdyniya Polytechnic Institutes with their welding

NIKOLAYEV, G.A.

137-58-2-3273

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 144 (USSR)

AUTHOR: Nikolayev, G.A.

TITLE: A Contribution to the Analysis and Design of Welded Structures (K voprosu rascheta i proyektirovaniya svarnykh konstruktsiy)

PERIODICAL: V sb.: Prochnost' i avtomatizatsiya svarki. (MVTU, 71). Moscow, Mashgiz, 1957, Nr 3-19

ABSTRACT: Various propositions pertaining to the analysis of welds (W) discussed in the foreign literature are examined. Examples of the stress analysis of W by the methods adopted in the USSR and by those of the ISO of Holland are presented. It is shown that the differences in structural strength characteristics vary so slightly with the different methods of analysis as to have no effect on the cost of construction and, therefore, the proposals made abroad for certain changes in the method of stress analysis of welds do not represent progress. It is noted that the stress permitted in W in a number of leading branches of industry today are lower than those that are actually practicable. Different methods of evaluating the strength of W subject to variable loads are compared. The method proposed and developed by

Card 1/2

137-58-2-3273

A Contribution to the Analysis and Design of Welded Structures

the TsNIS sb. - d. transporta by B.N.Duchinskiy is recommended for the stress analysis of W operating under variable loads. Problems of rational design W with allowance for fatigue loads are examined, as is the employment of the most advanced methods of welding technology.

S.M.

1. Welded structures--Design 2. Welded structures--Analysis 3. Welds--Stress analysis

Card 2/2

SOV/137-58-11-22591

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 109 (USSR)

AUTHOR: Nikolayev, G. A.

TITLE: Advances in the Field of Investigation and Strength Calculation of Weldments (Razvitiye issledovaniy i raschetov prochnosti svarnykh konstruktsiy)

PERIODICAL: V sb.: Teor. osnovy konstruirovaniya mashin, Moscow, Mashgiz. 1957, pp 107-137

ABSTRACT: A survey of the progress made in the USSR in the field of investigation and strength (S) calculation of weldments (WS). The following topics are discussed: Stress distribution in WS subjected to external loads and their S characteristics under static and impact loads; inherent stresses in WS and their effect on the S of the latter; strength characteristics in the process of welding; the strength of WS operating under alternating and repetitive static loads; deformation occurring in WS during welding; modern trends in the development of standards and technical specifications for the design of WS. Bibliography: 99 references.

Card 1/1 B. V.

NIKOLAYEV, G.A.

NIKOLAYEV, G.A., doktor tekhn.nauk, prof.

Structural welding. Svar.proizv.no.11:9-12 N '57. (MIRA 10:12)

1. Chlen-korrespondent Akademii stroitel'stva i arkhitektury SSSR.
(Structural frames--Welding)

NIKOLAYEV, G.A., Zaslushennyy deyatel' nauki i tekhniki, doktor tekhn. nauk, prof.

Using welding in machinery construction. Vest.mash. [37] no.11:62-65 N '57. (MIRA 10:10)
(Welding) (Machinery--Construction)

NIKOLAYEV, G.A., doktor tekhnicheskikh nauk, professor.

Calculations and design of welded structures. (Trudy) MVTU no.71:3-19 '57 (MIRA 10:7)
(Structural frames--welding)

PHASE I BOOK EXPLOITATION 927

Mezhvuzovskaya konferentsiya po svarke, 1956

Sbornik dokladov...(Reports of the Interuniversity Conference on Welding, 1956) Moscow, Mashgiz, 1958. 266 p. 7,000 copies printed.

Sponsoring Agency: Moscow. Vysshaye tekhnicheskoye uchilishche.

Ed.: Nikolayev, G.A., Doctor of Technical Sciences, Professor; Ed. of Publishing House: Mezhova, V.A.; Tech. Ed.: Tekhanov, A.Ya.; Managing Ed. for Literature on Heavy Machine Building (Mashgiz): Golovin, S.Ya., Engineer.

PURPOSE: This book is intended for welding engineers and technical personnel of scientific research organizations.

Card 1/6

AVAILABLE: Library of Congress

GO/hcr
12-15-58

Card 6/6

NIKOLAYEV, G.A., prof., zaslushennyy deyatel' nauki i tekhniki

Scientific research work in institutions of higher education.
Nauch.dokl.vys.shkoly; mash.i prib. no.1:7-12 '58.
(MIRA 12:1)

1. Chlen-korrespondent Akademii stroitel'stva i arkhitektury SSSR.
(Engineering research)

SOV/137-58-12-24589

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 12, p 87 (USSR)

AUTHOR: Nikolayev, G. A.

TITLE: Problems in the Automation of Welding Operations (Voprosy avtomatizatsii svarki)

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Mashinostroyeniye, 1958, Nr 1, pp 84-93

ABSTRACT: More than 30% of all welding (W) operations in heavy machinery building industry are carried out automatically. The majority of W operations are performed by the submerged-arc method. Coated-electrode slag W is employed for W of heavy steel plates (200-400 mm and over). Considerable progress has been made in the development of argonarc W employing fusible and nonfusible electrodes. In many instances it is more economical to perform W operations in a CO_2 medium. Automatic devices are being developed for various W processes and conditions. Specifications of a number of devices are shown (semiautomatic W machines, automatic units for shielding-gas W equipped with a traveling mechanism, automatic machines for butt W of pipes which are held stationary during W, etc.) and

SOV/137-58-12-24589

Problems in the Automation of Welding Operations

their purpose and fields of application are outlined.

V. S.

Card 2/2

NIKOLAYEV, G.A

135-58-4-14/19

AUTHOR: Okerblom, N.O., Professor, Doctor of Technical Sciences

TITLE: A Conference on Welding in the German Democratic Republic (Konferentsiya po svarke v Germanskoy Demokraticheskoy Respublike)

PERIODICAL: Svarochnoye Proizvodstvo, 1958, Nr 4, pp 40-42 (USSR)

ABSTRACT: A conference on welded structures was held at Halle from the 9th to 11th October 1957. It was organized by the Palata tekhniki (Chamber of Engineering) and the Tsentral'nyy institut svarochnoy tekhniki Germanskoy Demokraticheskoy Respubliki (The Central Institute of Welding of the German Democratic Republic). About 1,000 participants were present, including delegates from Bulgaria, Hungary, West Germany, Poland, Rumania, USSR, Czechoslovakia, Switzerland, Yugoslavia and Japan. The Soviet delegation from the NTO mashinostroitel'noy promyshlennosti Sovetskogo Soyuza (Scientific-Technical Department of the Soviet Union Machine-Building Industry) included the author of this article, A.N. Shashkov, Candidate of Technical Sciences, and G.A. Maslov, Dotsent. Professor G.A. Nikolayev, Doctor of

Card 1/3

A Conference on Welding in the German Democratic Republic

Technical Sciences; B.S. Kasatkin, and V.V. Bashenov, Candidates of Technical Sciences; were sent by other Soviet organizations. The intrcductory report was delivered by State Secretary Teisenis (Ministerstvo tyazhelogo mashinostroyeniya - Ministry of Heavy Machine-Building). The Conference heard the following reports: Professor G.A. Nikolayev, on "Problems of Automation in Welding Processes"; B.S. Kasatkin, on "Automatic Welding of Heat-Resistant Steels in Carbon Dioxide Gas Shields"; V.V. Bashenov, on "Fields of Application and Technico-Economic Characteristics of Welding in Carbondioxide Gas Shields"; Doctor V. Gil'de (Director of the Tsentral'nyy institut svarochnoy tekhniki - TSIS - the Central Institute of Welding Engineering), on "Use of High-Strength in Welding Engineering"; V. Anders, (Technical Director of TSIS), on "Shrinkage in Girder Parts Welded Under Flux"; A. Heyman (Head of the Otdel issledovaniy TSIIS - the TSIIS Experimental Department), on "Strength and Endurance of Joints Welded Under Flux and Their Calculation"; R. Myuller, Diploma-Engineer from Magdeburg, on "Influence of the Constructive Shape of Machine Parts on

Card 2/3

135-58-7-1/20

AUTHOR: Nikolayev, G.A., Honored Scientist, and Mordvintseva, A.V., Candidate of Technical Sciences

TITLE: Welding Martensite Steel Turbine Parts (Svarka detaley turbin iz martensitnoy stali)

PERIODICAL: Svarochnoye proizvodstvo, 1958, Nr 7, pp 1-5 (USSR)

ABSTRACT: Information is presented on a series of experiments carried out at the MVTU imeni Bauman, on the basis of which the welding technology for joining 2X13 steel blades to turbine disks was developed. The electrode material finally chosen is "E 654". Chemical composition of metals and seams is also given. The tests proved high mechanical properties of welds produced in carbon dioxide; no cracks were revealed. A special installation with a clamping device was designed for the welding operation. The method described was brought into use at the plant where the tests had been carried out.
There are 7 graphs, 3 tables and 4 Soviet references.

Card 1/2

Welding Martensite Steel Turbine Parts 135-58-7-1/20

ASSOCIATION: MVTU imeni Bauman

1. Steel-Welding 2. Welding electrodes—Applications

Card 2/2

SOV-135-58-9-8/20

AUTHOR: Nikolayev, G.A., Honoured Scientist and Technician, Doctor of Technical Sciences, Professor

TITLE: Principal Trends of Scientific Research Work in the Welding Chair of MVTU imeni Bauman (Osnovnyye napravleniya nauchno-issledovatel'skikh rabot na kafedre svarochnogo proizvodstva MVTU imeni Baumana)

PERIODICAL: Svarochnoye proizvodstvo, 1958, Nr 9, pp 22-26 (USSR)

ABSTRACT: The article deals with scientific research work on principal problems of welding engineering. Information is presented on the following subject: 1) S.A. Kurkin and V.A. Vinokurov investigated problems of residual stresses and strength of welded structures and proposed a method to eliminate residual stresses by rolling the welds on a special machine; 2) I.I. Makarov participated in developing new machines with electromagnets for testing weld joints by bending force with resonance clamps and a frequency of up to 200 cycles; 3) A.V. Mordvintseva proved the effect of the chosen electrode type on residual stresses in welding turbine runners of 2Kh13 martensite steel; 4) N.N. Prokhorov and his assistants developed new types of machines for

Card 1/4

Principal Trends of Scientific Research Work in the Welding Chair of MVTU imeni Bauman

investigating the strength of weld joints, including the "P4" machine for simultaneous testing of a large group of specimens to hot crack formation, a machine for investigating mechanical properties of aluminum specimens in high temperatures, a machine for investigating the resistance against cold crack formation during the period of austenitic decomposition of the joint in cooling; 5) M.N. Chelnokov and M.P. Bochay carried out investigations on resistance of weld joints to hot cracks in copper anu aluminum alloys; 6) A.V. Mordvintseva and N.A. Ol'shanskiy investigated welding of rare metals in special chambers with carbon electrode in a vacuum and in argon. This method made it possible to weld zirconium and molybdenum of 1 - 2 mm thickness. Welding titanium alloys with tungsten electrode in argon under a special cover gave satisfactory results; 7) Ol'shanskiy and Mordvintseva, together with M.N. Krumbol't, obtained good results in joining various materials by ultrasound application, such as austenitic steel and aluminum alloy plates of a fe- tenths of a mm. thickness. Welds joined by ultrasonic method reached strength exceeding that of the base metal. Successful attempts were also made for welding plastics by ultrasound; 8) A.I. Akulov conducted work in

Principal Trends of Scientific Research Work in the Welding Chair of MVTU imeni Bauman

developing technology and equipment for welding austenitic steels in argon and low-carbon steels in carbon dioxide. Equipment included a welding gun with mechanized wire feed (Fig. 5); welding machines without support rings for movable pipe butt welding of 4 - 15 mm wall thickness and immovable pipe butts 60 - 150 mm in diameter; 9) devices for cutting thick steel and cast iron (Fig. 8), and for cutting-out apertures in low-carbon steel pipes (Fig. 9) were designed under the supervision of G.B. Yeseyev; 10) methods were developed for fagot cutting of austenitic steel by the oxygen-flux method. 11) V.V. Frolov supervised the development of ceramic fluxes for welding copper and bronse; 12) in 1957, N.L. Kaganov designed a two-position capacitor machine for spot welding, type K-23;13) S.T. Lazarov supervised the work in developing methods of checking weld joints by ultrasound; 14) Thulium-170 isotope for gamma-detection of defects can be used to examine weld joints on thin steel, aluminum, titanium and light alloys; 15) an experimental de-

Principal Trends of Scientific Research Work in the Welding Chair of MVTU imeni Bauman

vice was designed, which can obtain X-ray "Bremsstrahlung" with various energies from thulium; 16) application of electronic-optical instruments for checking weld joints by X-gamma-rays was started. Organization of experimental laboratories at the MVTU is planned. There are 2 graphs, 2 diagrams and 10 photos.

1. Welding research--USSR 2. Welding Engineering

Card 4/4

SOV/135-58-12-15/20

AUTHOR: Nikolayev, G.A., Professor, Doctor of Technical Sciences, Honored Scientist and Technician

TITLE: On the 20th Anniversary of the Mashgiz (K dvadtsatiletiyu Mashgiza)

PERIODICAL: Svarochnoye proizvodstvo, 1958, Nr 12, pp 36-37 (USSR)

ABSTRACT: Brief information is given on the activities of the Mashgiz publishing house, which was founded in 1938, and its part in the development of welding techniques is stressed. Periodicals published by Mashgiz and containing important information on new technical achievements in the welding practice are mentioned.

Card 1/1

SOV/135-58-12-18/20

AUTHOR: Nikolayev, G.A., Professor, Doctor of Technical Sciences, Honored Scientist and Technician

TITLE: Foreign Literature on Welding (Inostrannaya literatura po svarke)

PERIODICAL: Svarochnoye proizvodstvo, 1958, Nr 12, p 39 (USSR)

ABSTRACT: This is a critical review of a book by I. Chabelka, entitled "The Effect of Oxygen on the Toughness and Ageing of Steel", published in Bratislava in 1958.

Card 1/1

GOLUBERG, Mikhail Mikhaylovich, prof., doktor tekhn.nauk; NIKOLAYEV, G.A., prof., doktor tekhn.nauk, retsenzent; MAYZEL', V.S., insh., red.; VASIL'YEVA, V.P., red.izd-va; POL'SKAYA, R.G., tekhn.red.

[Metal parts of cranes; calculations taking fatigue into account] Metallicheskie konstruktsii kranov; raschet s uchetom iavleniia ustalosti. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1959. 181 p. (MIRA 12:4)

1. Chlen-korrespondent Akademii stroitel'stva i arkhitektury SSSR. (Cranes, derricks, etc.)

28(1) PHASE I BOOK EXPLOITATION SOV/2156

Soveshchaniye po kompleksnoy mekhanizatsii i avtomatizatsii tekhnologicheskikh protsessov. 2nd, 1956.

Avtomatizatsiya mashinostroitel'nykh protsessov; [trudy soveshchaniya], tom. 1: Goryachaya obrabotka metallov (Automation of Machine-Building Processes; Proceedings of the Conference on Over-All Mechanization and Automation of Technological Process, Vol 1: Hot Metal-Forming) Moscow, 1959. 398 p. 5,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut mashinovedeniya. Komissiya po tekhnologii mashinostroyeniya.

Resp. Ed.: V.I. Dikushin, Academician; Compiler: V.R. [illegible]; Ed. of Publishing House: V.A. Kotov; Tech. Ed.: I.F. Kuz'min.

PURPOSE: The book is intended for mechanical engineers and metallurgists.

COVERAGE: The transactions of the Second Conference on the Over-All Mechanization and Automation of Industrial Processes, September 25-29, 1956, have been published in three volumes. This book, Vol. I, contains articles under the general title, Hot Working of Metals. The investigations described in the book were conducted by the Sections for Automation and Hot Working of Metals, under the direction of the following scientists: casting - P.N. Aksenov, D.P. Ivanov and G.M. Orlov; forming - A.I. Tselikov, A.D. Tomlenov and V.T. Meshcherin; welding - G.A. Nikolayev, B.I. [illegible] and G.A. Maslov. There are 183 references: 142 Soviet, 34 English, 6 German, and 1 French.

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Card [illegible]

28(1) PHASE I BOOK EXPLOITATION SOV/2156

Soveshchaniye po kompleksnoy mekhanizatsii i avtomatizatsii tekhnologicheskikh protsessov. 2nd, 1956.

Avtomatizatsiya mashinostroitel'nykh protsessov; /trudy soveshchaniya/, tom. 1: Goryachaya obrabotka metallov (Automation of Machine-Building Processes; Proceedings of the Conference on Over-All Mechanization and Automation of Technological Process, Vol 1: Hot Metal-Forming) Moscow, 1959. 394 p. 5,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut mashinovedeniya. Komissiya po tekhnologii mashinostroyeniya.

Resp. Ed.: V.I. Dikushin, Academician; Compiler: V.A. Kuznetsov; Ed. of Publishing House: V.A. Kotov; Tech. Ed.: I.F. Kuz'min.

PURPOSE: The book is intended for mechanical engineers and metallurgists.

COVERAGE: The transactions of the Second Conference on the Over-All Mechanization and Automation of Industrial Processes, September 25-29, 1956, have been published in three volumes. This book, Vol. I, contains articles under the general title, Hot Working of Metals. The investigations described in the book were conducted by the Sections for Automation and Hot Working of Metals, under the direction of the following scientists: casting - P.N. Aksenov, D.P. Ivanov and G.A. Orlov; forming - A.I. Tselikov, A.D. Tomlenov and V.T. Meshcherin; welding - G.A. Nikolayev, B.I. Medvedev and G.A. Maslov. There are 133 references: 142 Soviet, 36 English, 6 German, and 1 French.

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AVAILABLE: Library of Congress

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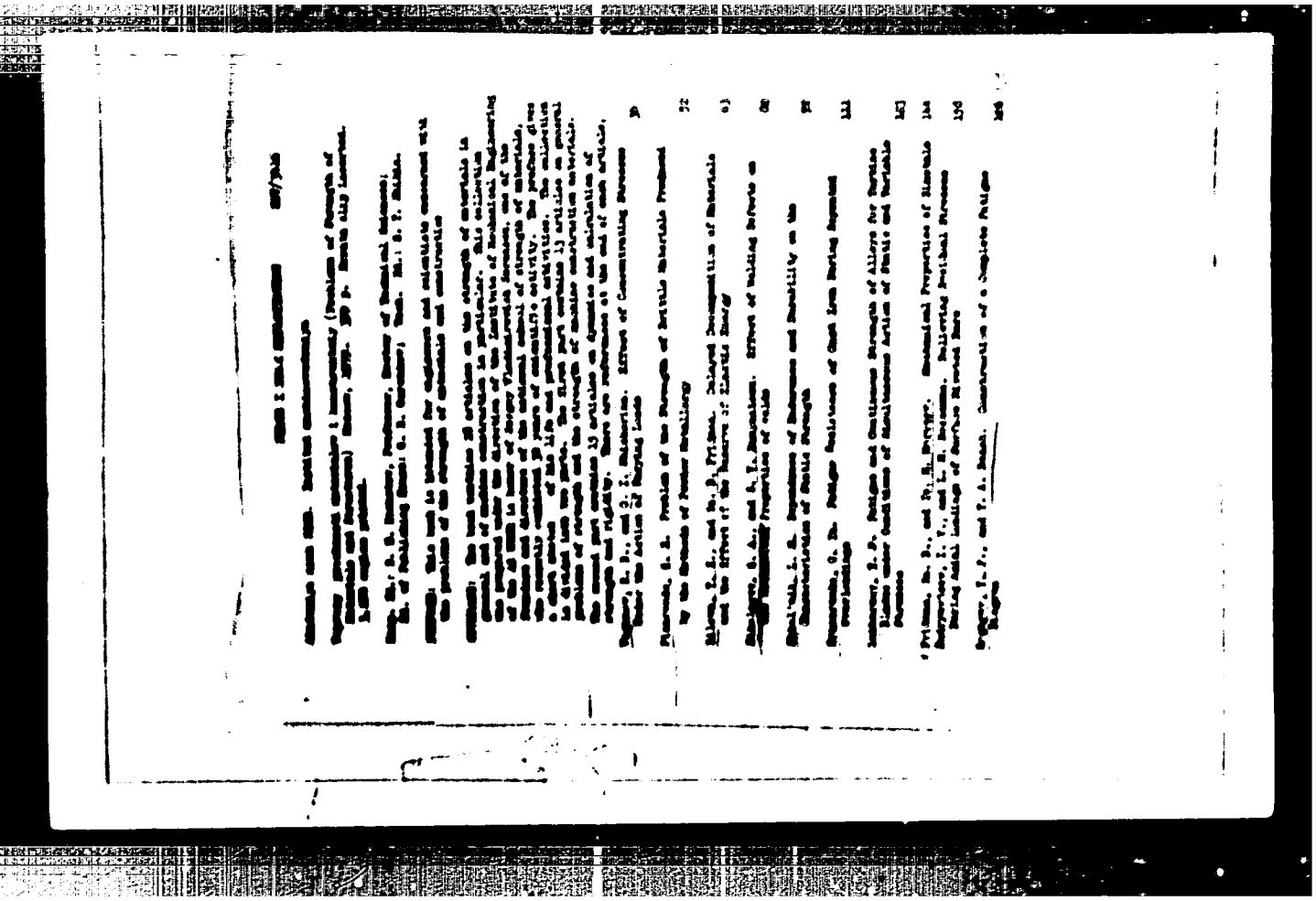
9/23/59



NIKOLAYEV, G.A.

New methods for welding construction elements. Izv.AS1A no.3:70-78 '59. (MIRA 13:6)

1. Chlen-korrespondent Akademii stroitel'stva i arkhitektury SSSR.
(Electric welding--Equipment and supplies)

22 (1) SOV/135-59-4-1/18

AUTHOR: Nikolayev, G. A., Honored Scientist and Technician, Doctor of Technical Sciences, Professor.

TITLE: The Training of Welding Engineers Must Be Improved (Uluchshit' podgotovku inzhenerov-svarshchikov)

PERIODICAL: Svarochnoye proizvodstvo, 1959, Nr 4, pp 1 - 3 (USSR)

AUTHOR: The author outlines the present organization of the training of welding engineers (carried out in 13 institutes) in the USSR and suggests ways to improve it. The number of applications for the first course in 1958 was over 1,200. Most vuzes, such as the MVTU imeni Bauman , are training welding engineers in machine building practice. Others, such as the Severo-zapadnyy zaochnyy politekhnicheskiy institut (Northwest Polytechnic Institute for Correspondence Study) and LSZPI, are using physical and chemical processes and metallurgy as a basis for training. The training problems were discussed in an inter-vuz conference with representatives from NTO of

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The Training of Welding Engineers Must Be Improved

Mashprom, on 28 to 29 January 1959 in Moscow. Vuz representatives G. A. Nikolayev, N. O. Okerblom, K. V. Lyubavskiy, S. Ye. Alekin, B. Ye. Paton, M. K. Gu-sel'shchikov , A. A. Alekseyev, A. A. Alov, V. D. Matskevich, M. I. Dombrovskiy, A. T. Galaktionov and others participated in discussing the problems of improving the training of regular students, part-time students, correspondence students, and students of specialties other than welding. The conference concluded that two ways of training should be applied: 1) General technical knowledge programs are to prepare engineers for specialization in the operation of electric welding equipment, the metallurgy and technology of welding processes, and the welding of structures; 2) special programs are to include technology in the fields of machine building, metallurgy, construction engineering, transportation means and shipbuilding. The welding faculties will be in charge of the general programs, while the special programs will be handled by the other relevant faculties. This will relieve the acute need for welding engineers in these fields. The author points out

The Training of Welding Engineers Must Be Improved

that most of the students' industrial training period cannot be utilized due to the lack of proper working places. He thinks that one month visits to various industrial enterprises would yield better results. Later on, the students should work in the designing departments of a plant or in a research laboratory during the last term before their diploma project. The vuz laboratories should be equipped with more modern equipment. The pertinent vuz departments should cooperate with plant laboratories and the laboratories of the research institutes in questions of equipment. Textbooks for students participating in correspondence study in the field of welding have to be edited. Efficient students should be given several working hours off per week without deduction of pay. The 20 to 25 hours devoted to welding problems in some vuzes that have no special faculty for this field is considered to be absolutely insufficient. There should be at least 60 to 70 hours. The program of construction vuzes should provide for 100 hours in the

The Training of Welding Engineers Must Be Improved

field of welding. There is 1 chart.

ASSOCIATION: MVTU imeni Bauman.

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SOV/122-59-4-14/28

AUTHORS: Nikolayev, G.A., Meritorious Scientific & Technical Worker, Doctor of Technical Sciences, Professor, and Ol'shanskiy, N.A., Cand. Technical Sciences, Docent

TITLE: The Application of Ultra-Sound in Welding (Primeneniye ul'trazvuka pri svarke)

PERIODICAL: Vestnik Mashinostroyeniya, 1959, Nr 4, pp 51-55 (USSR)

ABSTRACT: The use of ultrasonic vibrations in spot and seam welding is shown diagrammatically. A magneto-striction transducer is excited by a coil supplied from an electrical generator at ultrasonic frequency. The mechanical vibrations produced are transmitted to a conical or similar wave guide as longitudinal waves. One of the electrodes of a spot welding unit is attached transversely at the tip of the cone. The longitudinal vibrations of the cone produce shear stresses in the joined sheets pressed together between the two electrodes. An installation for seam welding on similar principles has been developed at the Moskovskoye Vysshoye Tekhnicheskoye Uchilishche (Moscow Higher Technical College) and the Moskovskoy Energeticheskiy Institut (Moscow Power Institute). A concentrated short period heating up

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The Application of Ultra-Sound in Welding

takes place, caused by the plastic deformations due to the shear stresses associated with friction forces. Local crystals are formed in the boundary zone. Apparently, the elevated temperature assists the inter-diffusion between the two components. The welding takes place without fusion. The temperature is the higher, the greater the heat conductivity of the material, e.g. 600 °C in copper alloys and 400 °C in aluminium. Tests with stainless steel of 0.1 mm thickness (Fig 3) show an increasing shear strength of the joint with increasing elec trode pressure. A joint is formed in less than 1 second. With 1 mm thick aluminium alloy sheet, the process takes about 0.5 sec. Joints between different metals have been made, in particular aluminium and copper. Ultrasonic spot welding requires no previous cleaning of the metal surfaces, it causes little plastic deformation around the spot and changes the properties of the parent metal least. At present, the maximum wall thickness is limited to 3 mm. Some applications are considered. In the same manner, the welding of plastics has been successfully achieved. An experimental

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installation is illustrated (Fig 4). The physical nature of the process is still being studied. Thicknesses up to 10 mm can be welded. Residual stresses in fusion welding of steel have been shown to vary in time owing to the disintegration of residual austenite. This disintegration has been arrested either by high temperature heat treatment, by caulking the seam and by sub-zero treatment. Specimens in the form of slotted rings of 20 KhGSA steel of 3.2 mm diameter, were deformed after the welding of the edges. Argon arc welding with a tungsten electrode was used. Ultrasonic vibrations of 20 kcps were applied to the specimen. Treating the welded joint region over a width of 6-12 mm reduced the degree of deformation with time by a factor of 2. Similar effects were discovered in structures. The effect of ultra-sound on the crystallization of the welding pool in fusion welding was confined in medium carbon steel to an increase of 80% in tension strength under impact. In stainless and other chromium steels no appreciable change in micro-structure was observed.

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The joint density in argon arc welding of aluminium alloys was improved by ultra-sound.
There are 5 figures and 2 tables.

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18(5,7) SOV/135-59-9-8/23

AUTHOR: Nikolayev, G. A., Honored Scientist, Doctor of Technical Sciences, Professor

TITLE: Scientific Research Activities of the Department of Welding Production at MVTU imeni Bauman

PERIODICAL: Svarochnoye proizvodstvo, 1959, Nr 9, pp 23-26 (USSR)

ABSTRACT: The author presents a summary of the activities of the welding department at MVTU imeni Bauman during the last year. S. A. Kurkin, Docent, and V. A. Vinokurov, Candidate of Technical Sciences, worked on the improvement of measuring methods of residual stress and deformation caused by welding. On new methods of supersonic spot welding, Candidates of Technical Sciences A. V. Mordvintseva and N. A. Ol'shanskiy worked, also Engineer M. N. Krumboldt. Fig 2 shows schemes of corresponding devices. MEI participated in these studies. The investigations showed that supersonic welding can be used for thermoplastic materials (article of N. A. Ol'shanskiy and A. V. Mordvintseva, in this number of the periodical). Candidate of Technical Sciences L. Ye. Alekin and Engin-

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Scientific Research Activities of the Chair of Welding Production at MVTU imeni Bauman

eer N. S. L'vov worked on automation of arc welding. Devices type TSG-4 were tested (by Candidate of Technical Sciences A. I. Akulov and Engineer V. V. Spitsyn). These devices are used in the mines of Bugul'ma, Omsk and Ufa. Under the supervision of Candidate of Technical Sciences N. L. Kaganov, devices for contact welding have been worked out. ("Svarochnoye proizvodstvo" 1959, Nr 7). Methods of carbon-flux cutting are being developed under the supervision of Candidate of Technical Sciences G. B. Yevseyev. Candidate of Technical Sciences S. T. Nazarov and Engineer Yu. P. Panov worked on control methods for weld qualities. Electron optical devices (constructed by VEI imeni Lenin) were used for these investigations. Technological processes were investigated under the supervision of Candidate of Technical Sciences I. I. Makarov. Doctor of Technical Sciences N. N. Prokhorov, Engineers M. P. Bochau and E. L. Makarov and others worked at research in the fields of technological strength of metals and welding. There

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Scientific Research Activities of the Chair of Welding Production at MVTU imeni Bauman

are 1 photograph, 3 drawings and 7 graphs.

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SOV/135-59-10-4/23

18(2,3,7)

AUTHOR: Nikolayev, G.A., Doctor of Technical Sciences, Professor, Honored Scientist and Technician

TITLE: Scientific Research Work of Chinese Students

PERIODICAL: Svarochnoye proizvodstvo, 1959, Nr 10, pp 9-11 (USSR)

ABSTRACT: The MVTU imeni Baumana (MVTU imeni Bauman) accepted the theses on welding techniques of several students from the Chinese Peoples Republic several of which are described in this article. The thesis of Wu Chiu-tsang which was prepared at the Institut metallurgii imeni Baykova AN SSSR (Institute of Metallurgy imeni Baykov AS USSR) under the supervision of Candidate of Technical Sciences M.Kh. Shorshorov, handles the question of processes during "electric slag welding" of heat resistent alloys on a nickel basis of type EI437 and EI437B. The alloy contains: 0.05% C; 0.25% Mn; $\leq$ 0.004% S; $\leq$ 0.005% P; 20% Cr; 2.5% Ti; 0.7% Al; 0.4% Fe; 0.03% Cu; the rest is nickel. The mechanical qualities: σ_v = 105 + 117 kg/mm^2; σ_t = 65 + 75 kg/mm^2; δ_{10} = 20 + 28% at room temperature; σ_v = 71 + 82 kg/mm^2 and σ_t = 46 + 61 kg/mm^2 at a temperature of

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Scientific Research Work of Chinese Students

700°C. The best indicators for the weld resulted from using flux type FTs-4 (80% CaF_2, 15% $BaCl_2$, 5% SiF_2) and FTs-7 (80% CaF_2, 15% $BaCl_2$, 3% SiF_2 and 2% NaF). The candidate developed ceramic fluxes. The composition of the alloy was them: 8.5% Ti; 19.8% Nb; 3.4% Al; 1.8% Si; 5.3% Fe; the rest nickel. The welds of the students' experiments show high mechanical qualities and research in this field shall be continued. A thesis on the use of supersonics for "electric slag welding", to obtain a better structure of welds, and the technology and device for welding ring welds of a press cylinder was developed by student Lin Jui-lin at the MEI experimental base under the supervision of Candidate of Technical Sciences N.A. Ol'shanskiy. Fig.1 shows the experimental device for the introduction of supersonics into the welding "tub". Supersonic vibration was produced by a generator type YZG-10. Different supersonic vibrations introduced into the welding tub were examined. The core becomes smaller via supersonics and the dendrite structure is considerably eliminated from the melted metal. For development of the technology, the experience gathered at the

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Novo-Kramatorskiy Machine Factory were used. A thesis on argon arc-welding of aluminum coverings for assembly bridges was prepared by student Kuan Ch'iao at the TsNIISK experimental base under supervision of Candidate of Technical Sciences A.Ya. Brodskiy. The used material was the alloy type AMg6T (σ_v = 30 ÷ 32 kg/mm^2, σ_T = 16 kg/mm^2 and δ = 12 ÷ 15%). In particular the technological process was worked out. Several calculations were made to determine the permanent deformation of the covering, which is caused by the packing of the welds. The expediency of the use of intermittent welds with small cathetuses is shown, plus a preliminary fastening of the elements to be welded, the application of cut-out holes and flanges in order to get a higher moment of inertia and to use the local heating. A thesis on a condenser machine and the technology for the welding of thin components worked out by the student Leng Ch'uan-sh'ing at the MVTU imeni Bauman experimental base under the supervision of Candidate of Technical Sciences N.L. Kaganov. The student worked under the direct supervision of the Chinese specialist, Aspirant of the MVTU Chiang I-hung. A great

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Scientific Research Work of Chinese Students

number of investigations into electric layouts of machines and on welding conditions for austenitic steel 1Kh18N9T, welded on spot welding machines, were made. The dependence of the supporting power on the charging voltage, when welding austenitic steel of 0.15 + 1.5 mm (Fig.5) and on the pressure on the electrode, when welding austenitic steel of 0.1 + 1.0 mm, was examined (Fig.6). There are 1 photograph and 5 graphs.

ASSOCIATION: MVTU imeni Baumana (MVTU imeni Bauman)

PHASE I BOOK EXPLOITATION SOV/4810

Nikolayev, G. A., A. I. Akulov, O. N. Bratkova, G. B. Yevseyev, N. D. Kuganov, A. V. Mordvintseva, and S. T. Nazarov

Svarka (Welding) Moscow, Mashgiz, 1960. 106 p. (Series: Sovetskoye mashinostroyeniye v 1959-1965 gg.) 4,000 copies printed.

Ed. of Series: I. I. Changli; Managing Ed. for Literature on Heavy Machine Building: S. Ya. Golovin, Engineer; Ed. of Publishing House: G. N. Soboleva; Tech. Ed.: G. V. Smirnova.

PURPOSE: This booklet is intended for technical personnel in plants, Councils of the National Economy, and project bureaus, and may also be useful to students who intend to work in these fields.

COVERAGE: The authors discuss the development of welding methods in machine building and civil engineering. The following are considered: automatic arc welding, electroslag welding, automatic resistance welding, gas-flame processing, automatic surfacing of metals, inspection of welded joints, and modern methods of joining metallic and nonmetallic materials. No personalities are mentioned. There are no references.

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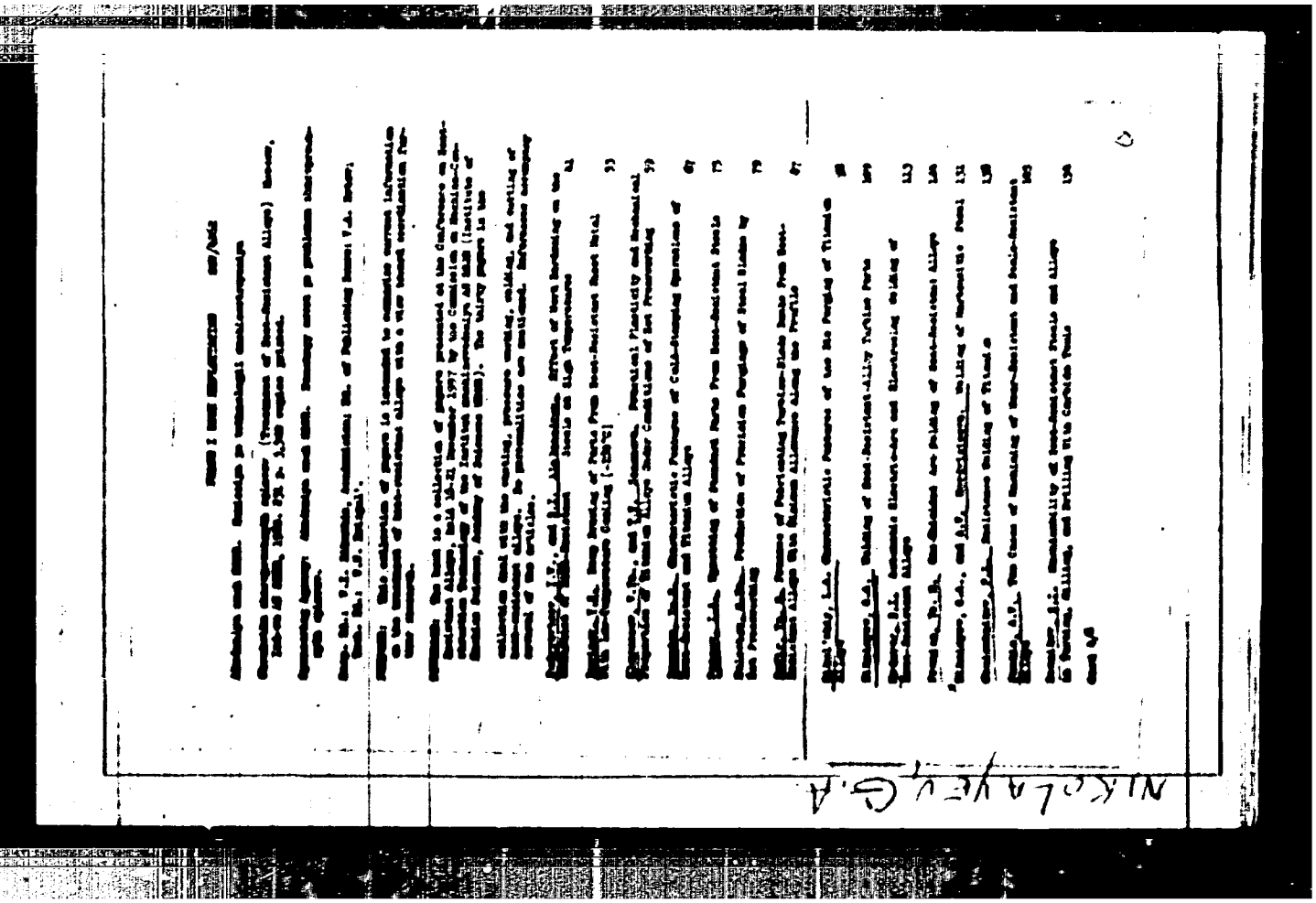

Nikolayev, G.A.

PHASE I BOOK EXPLOITATION SOV/[illegible]

[illegible] [illegible] i napravleniya razvitiya tekhnologii mashinostroyeniya i [illegible] (Present State of the Manufacturing Processes in the Machine and Instrument Industries and Trends for Development) Moscow, Mashgiz, 1960. [illegible] p. [illegible] copies printed.

Ed.: [illegible] [illegible] [illegible], Doctor of Technical Sciences, Professor; [illegible] Ed. for Literature on Machine Building and Instrument Construction ([illegible]): [illegible], Engineer; Ed. of Publishing House: G.F. [illegible], [illegible] Tech. Eds.: V.D. El'kind and A.Ya. Tikhanov.

PURPOSE: This book is intended for technical and scientific personnel in the machine and instrument industries and for students and teachers of schools of higher education.

COVERAGE: The book deals with current theory and practice in the manufacturing processes of the machine and instrument industries and includes discussions on trends for development. The physical nature of the processes and their technical-economic features and possibilities are considered. Particular attention is given to new and progressive processing (supersonic machining, electric machining, cold [illegible], precision casting, precision pressing, new methods of welding, etc.). The book consists of papers presented at the All-Union

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Scientific-Industrial Conference on "Advanced Machine and Instrument Manufacturing Processes," held in 1958. The papers have been revised in the light of recent developments in the field. A chapter is devoted to the automation and mechanization of the industry. Soviet and non-Soviet references accompany some of the chapters.

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S/135/60/000/009/006/015
A006/A002

AUTHOR: Nikolayev, G. A., Professor, Doctor of Technical Sciences, Honored Scientist and Technician

TITLE: Scientific Research Work at the "Welding Practice" Department of MVTU imeni Bauman During 1959

PERIODICAL: Svarochnoye proizvodstvo, 1960, No. 9, pp. 17-21

TEXT: Information is given on results of scientific research work carried out at MVTU imeni Bauman on various trends in the welding practice. S. A. Kurkin, V. A. Vinokurov, Candidates of technical Sciences, and Engineer A. S. Gazaryan investigated natural stresses, residual deformations and strength of welded structures in the three following directions: 1) Determination of three-axial residual stresses in welding thick steel. Experiments with electro-slag welded 200 mm thick plates, investigation into the effect of aging on the relaxation of residual stresses and crack formation in electroslag welding of thick elements show that the formation of a rigid system of the stress field, where ductility is absent, occurs only when welding metal of over 100 mm thick-ness. Brittle failure may occur, and may also be caused at a smaller thickness

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Scientific Research Work at the "Welding Practice" Department of MVTU imeni Bauman During 1959

by the exhaustion of plastic deformation near the notches due to their non-uniform distribution. 2) Experimental and theoretical investigations were made together with NKTM on the deformation of thick plates in electroslag welding based on the measurement of the gaps between the edges. It was established that when welding 200 mm thick steel plates the displacement of edges occurred mainly in the direction of the welding process. The investigations performed can be used to set up practical technological measures for eliminating deformations affecting negatively the welding process. 3) Investigations were made to improve the quality of welds in thin walled work by eliminating warping and raising the strength of weld joints of aluminum alloys. The work was performed by Engineer V.A. Parakhin. As a result, the fatigue strength of non-ferrous alloy weld joints was essentially raised and a series of regularities were established which made it possible to reveal the origination of plastic deformations of a desired magnitude in burnishing and hard facing to a required degree. New welding methods were developed by N. A. Ol'shanskiy, and A. V. Mordvintseva, Candidates of Technical Sciences, engineers Yu. N. Zorin, V. I. Kachalov and others. The investigations were concentrated on welding in

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Scientific Research Work at the "Welding Practice" Department of MVTU imeni Bauman During 1959

controlled atmosphere, in vacuum chambers and by ultrasonic oscillations of various similar and dissimilar metals and plastics. They proved the possibility of welding by ultrasonic oscillation of zirconium (0.1 + 0.1 mm); copper (0.2 + 0.2 mm); D16AT (D16AT) alloy (0.6 + 0.6 mm); zirconium of 0.1 mm thickness with 0.5 mm thick 1Kh18N12T (1Kh18N12T) steel and other grades. Satisfactory results were obtained on welding of polymers on the PUT-5A (PUT-5A) machine designed at MVTU. Tests of ultrasonic welded joints of aluminum and copper alloys and thin-walled molybderum parts yielded positive results. Candidate of Technical Sciences A. I. Akulov and others devoted their investigations to automation and technology of arc welding process, by improving automatic heads for welding rotary pipe butts, such as the TSG-5 (TSG-5) head for welding with a single oscillating electrode. Machines were manufactured for the use of the TSG-4 and TSG-5 heads in semi-automatic welding of sheet structures. The automatic directing of the electrode along the edges in arc welding and the photo-electric tracking system were developed. The effect of a shielding medium (in blowing under) on the seam root for the manufacture of pipe blanks of 76-200 mm in diameter of 1Kh18N9T (1Kh18N9T) steel was investigated. Blowing was

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Scientific Research Work at the "Welding Practice" Department of MVTU imeni Bauman During 1959

made with pure argon and a mixture of nitrogen (97%) and oxygen (3%); nitrogen and hydrogen, 86 and 14%; 93 and 7 % respectively. The experiments showed that the ultimate strength, the bending angle and corrosion of the joint did not depend on the used shielding gas. D. M. Shashin and V. V. Spitsyn, engineers, proved by tests that shearing corrosion of 5 mm thick 1Kh18N12M2T steels welded in pure argon with Sv-OKh18N11M electrode was reduced by artificial cooling. Automation of resistance welding was studied by M. L. Kasanov, Candidate of Technical Sciences and others, by investigating spot and seam condenser welding of thin stainless steel parts, using condenser machines and energy proportioning hoppers K-22, K29 and K-30 (Fig. 6) ensuring high stability processes in spot and seam resistance welding. G. B. Yevgeyev and others studied gas cutting of BT-1A (VT-1D) titanium. An installation was developed for argon-hydrogen-arc cutting of AMg6T type aluminum alloys where the electric equipment was fully automatic, the control desk was concentrated on one frame and the arc feed was performed from a PS-500 generator, with 85 - 90 v idle-run voltage. The tests proved satisfactory. The studies will be continued by using the installation for plasma cutting of pipes, and the UPRT-104 (UPRT-104) head

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A006/A001

1.2200

AUTHOR: Nikolayev, G.A., Corresponding Member of AS and A SSSR

TITLE: Welded Structures

PERIODICAL: Svarochnoye proizvodstvo, 1960, No. 12, pp. 2-6

TEXT: The development in the production of welded structures and the level of mechanization which will be attained within 1958-65, is demonstrated in an exhibition. The author describes new methods developed in this field and presents photographs of a number of exhibits. The weight of structures can be reduced by 15-20% when riveting operations are replaced by welding. For instance the weight of a riveted crane beam is 1,226 kg/m against 1,002 kg/m of a welded beam of equal strength. The use of high-strength steels, such as 15ХСНД (15KhSND), 17Г2 (NL-2), 15ГС (15GS), 14ХГС (14KhGS), is being extended for heavy structures. Vaults in the form of shells are being used for roofings made of thin sheets combined with shaped components. Such structures can be easily produced by welding. The Institute of Electric Welding imeni Ye.O. Paton developed a method for the production of strip-folded pipes. Folded strips are welded along their edges and inflated with liquid or gas giving them the required shape of

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circular pipes. Since standardization of welded structural components is the basis of a further development in building techniques, the manufacture of standard structural components from strip-folded pipes is very promising, opening ways for a considerable reduction in weight and cost of articles. Such pipes may be used for the construction of garrets, masts, towers etc. Another method developed by the same Institute, awarded with the Lenin Prize is the industrial manufacture of welded containers. A model of a two-storey stand is on view where panels are folded into rolls. (Figure 5)

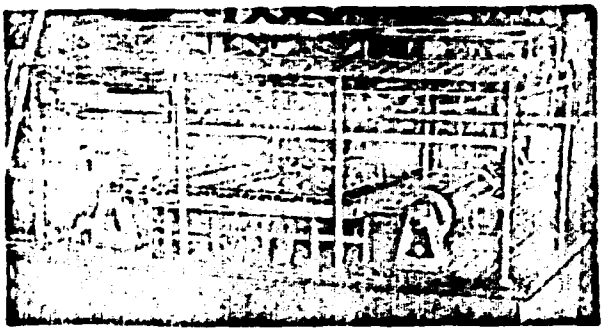

Figure 5

Model of a two-storey stand for the manufacture of panels folded into rolls.

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A006/A001

Welded Structures

The assembly of sheets and automatic welding of seams on electromagnetic devices is performed on the upper storey. On the lower storey the joints are welded from the reverse side and quality control of welds is made using a vacuum apparatus. A shaft laider is used to roll-on the frame sheet, and a central post to roll-on the bottom. The total weight of the stand is 75.4 tons and its efficiency is 5,000 tons structures per year. A gas holder assembled by the described method is exhibited. The weight of metal structures can also be reduced by using thin bent shapes instead of rolled sections. A set of various shapes is shown in Figure 6. The application of welding is demonstrated on a series of exhibits, including models of welded ship hulls, railway cars, electric slag welded open-hearth furnace frame stands; heavy stamping presses; die parts. Resistance welding is mostly applied in automobile building, this is shown on a "Volga" type automobile body with 7100 welded spots. The reliability of joints provides for a wide use of the welding process in boiler and high-pressure container building. The "Krasnyy kotel'shchik" Plant exhibits a welded TP-100 boiler shell model producing 640 tons steam per hour, of 1,800 mm internal diameter, 92 mm wall thickness, 22,700 mm drum length and 102.1 tons weight. The material used is 16GNM (16GNM) steel. The longitudinal seams are electric slag welded, the circular seams are welded under flux. Welding applied to heavy machine-building is shown

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Welded Structures

on a M16C (M16S) steel cementation furnace of 34-60 mm wall thickness and on a 9,900-liter capacity welded cylinder operating under a pressure of 320 kg/cm^2. Electric slag and automatic welding under flux are used for the manufacture of hydrogenerators and turbines, turbine blades and rotors. Welding operations are now being widely used in the construction of cranes, escalators, conveyers, excavators etc, which is shown in a number of exhibits, including also welded plastic articles. A particularly interesting model exhibited is a pipeline representing simultaneously the carrying beam of a bridge. There are 15 figures and 2 tables.

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NIKOLAYEV, G.A.; VINOKUROV, V.A.; GAZARYAN, A.S.; KURKIN, S.A.

Formation of inherent stresses in welding very thick metals.
Avtom.svar. 13 no.6:3-11 Je '60. (MIRA 13:7)

1. Moskovskoye vysshaye tekhnicheskoye uchilishche im. Baumana.
(Plates, Iron and steel—Welding)
(Thermal stresses)

PHASE I BOOK EXPLOITATION SOV/5739

Nikolayev, Georgiy Aleksandrovich, Honored Scientist and Technologist, Doctor of Technical Sciences, Professor, ed.

Sovremennoye sostoyaniye svarochnoy tekhniki (Present State of Welding Technology) [Moscow] Mashgiz, 1961. 6000 copies printed.

At head of title: Kollektiv sovetskikh i bekhoslovatskikh avtorov.

Authors: A.I. Akulov, G.B. Buneyev, N.L. Kaganov, S.A. Kurkin, K.V. Lyubavskiy, A.V. Mordvintseva, S.T. Nazarov, G.A. Nikolayev, and N.A. Ol'shanskiy, M. Bašista, J. Vinter, E. Honsík, A. Hrabovec, V. Hromádko, V. Dvořák, M. Záruba, S. Josífek, L. Kulhánek, L. Laný, Z. Lehký, J. Lukášek, K. Löbl, J. Mandaus, A. Matoušek, L. Münzner, M. Pavlásek, O. Puchner, V. Rída, M. Hauner, J. Čabelka, L. Švagr, J. Švejda, and P. Šubrt; Ed.: I.I. Chengli; Ed. of Publishing House: N.S. Stepanchenko; Tech. Ed.: V.D. El'kind; Managing Ed. for Literature on the Hot Working of Metals: S.Ya. Golovin.

PURPOSE: This book is intended for engineers and technicians working in the field of welding.

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PHASE I BOOK EXPLOITATION SOV/5656

Nikolayev, Georgiy Aleksandrovich, Natan L'vovich Kaganov, Nikolay Aleksandrovich Ol'shanskiy, Aleksandra Vladimirovna Mordvintseva, and Dmitriy Mikhaylovich Shashin

Novaya svarochnaya tekhnika v priborostroitel'noy promyshlennosti (New Welding Processes in the Instrument Industry) Moscow, Gosizdat "Vysshaya shkola", 1961. 110 p. 10,000 copies printed.

Ed. of Publishing House: D. Ya. Koptevskiy; Tech. Ed.: R. K. Voronina.

PURPOSE: This book is intended for students in schools of higher education and tekhnikums; it may also be used by technical personnel in the instrument industry.

COVERAGE: The principal modern methods of joining metals and nonmetallic materials are discussed. The book is based on scientific research work performed by the authors, and on other investigations conducted in the USSR and abroad in recent years. Much of

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D221/D302

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AUTHOR: Nikolayev, G. A., Doctor of Technical Sciences, Professor

TITLE: Automation and mechanization of welding and the development of advanced technology

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Mashinostroyeniye, no. 12, 1961, 21-30

TEXT: The author refers to the program of industrial development contained in the resolutions of the 20th and 21st Congresses of the Communist Party. According to it, low alloy steels are to replace carbon steels as the basic material. A survey of the processes of welding is given. For long seams carriages ТС-26 (TS-26) of the AS USSR (when the thickness of the material is smaller than 60 mm), and АДС-1000-2 (ADS-1000-2) with controlled feed of wire (for thickness of 6 - 30 mm) are used. The aluminum alloys are welded under flux by a method developed at the Institut elektrosvarki im. Ye. O. Patona (Institute of Welding im. Ye.O. Paton). For short

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seams semiautomatic units, such as ПШ-5У (PSh-5U) are used. The stud welding is carried out with A-564 guns. The self-propelled set for automatic welding АДСП-2 (ADSP-2) is employed in the case of heat resisting and aluminum alloys or titanium. A mention is made of the protective atmosphere, a.c. current welders developed by MVTU, the "Elektrik" factory, Institute imeni Paton, NII, VNIIST, VNIIKhIMMASH, etc. The mechanical properties of joints welded under the flux and CO_2 are close to those of the basic material when correct technology is adopted. Spot welding of aluminum alloys is made with МТПГ-600 (MTPG-600) and MTPG-1000 units, whereas large structures can be welded by K-165 sets with movable arms. Seam welding is made with МШШИ-2 (MShShI-2) unit when the thickness is up to 2.5 + 2.5 mm. For 3000 mm stretch, a МШП-500-3000 (MShP-500-3000) set is used. Spot welders using condenser energy were developed by MVTU, and an illustration of the МВТУ К-32 (MVTU K-32) unit is given. These machines are manufactured by PI in Kiyev and other organizations. The Р-296 (R-296) set is used for flat-wound tubes which are subsequently blown up to take a round shape. A description is given of a tube producing unit designed by Chelya-

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binskiy zavod (Chelyabinsk Factory). A mention is made of a semi-automatic line for assembly and welding of trolleys by the Toretskiy zavod (Toretsk Factory). Tracer controlled automatic welding installations are made by MVTU and TsNIITMASh. Negative feedback from a photocell is employed by the automatic device designed by MVTU which ensures a stable weld-through of butts in tubes. Electron beam welding is developed by MVTU and MEI. This is expedient for welding zirconium, titanium, molybdenum and other metals which are not weldable by conventional means. Investigations of vacuum techniques are being carried out by NII, IMET, the Institute imeni Paton and others. Ultrasonic welding of similar or dissimilar metals is employed for joining thin items, and with the aid of spot welder УТ-4 (UT-4) of MVTU-MEI. The same institution developed ultrasonic welders for plastics. A machine for automatic rolling of seams of thin structures (up to a few mm) made in austenitic or other plastic metals is shown. Automatic inspection with the aid of X-rays, magnetic flux, and ultrasonics are also being studied.

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NIKOLAYEV, G.A., doktor tekhn. nauk; CHERNOVA, Z.I., tekhn. red.; SOKOLOVA, T.F., tekhn. red.

[Welded structures] Svarnye konstruktsii. Izd. 3., perer. Moskva, Mashgiz, 1962. 552 p. (MIRA 15:9)

1. Chlen-korrespondent Akademii stroitel'stva i arkhitektury SSSR (for Nikolayev).
(Welding) (Strength of materials)

S/275/63/000/003/020/021
A052/A126

AUTHOR: Nikolayev, G.A.

TITLE: Ultrasound application to welding

PERIODICAL: Referativnyy zhurnal, Elektronika i yeye primeneniye, no. 3, 1963, 14, abstract 3V87 (In collection: Ul'trazvuk v stroit. tekhn., Moscow, Gosstroyizdat, 1962, 163 - 169)

TEXT: A review is given of ultrasound application to the control of quality and structure of welded joints, to connecting homogeneous and, in a number of cases, heterogeneous metals, to welding of plastics and high-polymeric materials. The potentialities are pointed out of ultrasound application to the elimination of residual stresses and deformations produced in the process of welding. The studies in the fields mentioned carried out at MVTU im. Baumann, the Central Scientific-Research Institute of Technology and Organization of Production, the Institute of Metallurgy im. Baykov, MEI, and others are stressed. A diagram of a point machine for ultrasonic welding of metal is given. Ultrasonics can be reliably used only for welding metals and alloys of a small thickness and for this reason it is recommended for

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use mainly in instrument and radio engineering. Plastics are welded at a thickness of up to 10 mm and more. Ultrasound does not weld thermoreactive plastics. There are 3 references.

C.S.

[Abstracter's note: Complete translation.]

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S/775/62/002/000/005/011

AUTHORS: Nikolayev, G. A., Ol'shanskiy, N. A., Krumbol'dt, M. N.

TITLE: New welding-technology processes.

SOURCE: Avtomatizatsiya protsessov mashinostroyeniya. t. 2: Goryachaya obrabotka metallov. Moscow, Izd-vo AN SSSR, 1962, 183-193.

TEXT: The 7-year Plan will witness a doubling in the mechanization and automatization of welding (WG) in the USSR, with some branches of automated welding production attaining 70-80% of the total WG operations. Greatest promise is afforded by automatic electric-arc submerged flux WG, arcless electric slag WG in a shielding atmosphere (Ar for Al, Ti, and other alloys; CO_2 for C and alloyed steels), also all types of contact welding. Applications: Heavy, agricultural, and chemical machine building, ship building, transportation, and building structures, also in hard-facing. Other WG problems are of great difficulty: WG of active metals (Ti, Mo, etc.), like and unlike metals tenths and hundredths of an mm thick (electronics applications), also some plastics and high-polymer materials. The paper describes new mechanized and automatized WG processes for these latter materials elaborated by the labs of the School of Welding Production of the Moscow Higher Technical School imeni Bauman (MVTU) jointly with the School of Metals Technology of the Moscow Power Institute (MEI). Inert-medium-shielded WG processes:

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Contrary to foreign Ar-shielded Ti and Mo manual-WG practice, the MVTU and MEI developed mechanized equipment (photo) in which the WG is done automatically in a chamber with a W electrode and a welding rod; the weldment is transported past a stationary WG head. 2-mm thick specimens were welded into joints with good plastic properties (180° bend) and corrosion resistance. Further progress requires development of bunker and continuous-feed devices to ensure continuity of the WG process; additional process improvement must take various properties of active metals and the geometry of weldments into account. Vacuum-chamber WG: Vacuum-chamber work at MVTU and MEI was motivated by a desire to eliminate the intrusion of noxious gases into a seam along with the Ar. At 10^{-4} torr and normal arc voltage, the arc from a W electrode burns extremely unsteadily. In 1958 an electron-beam WG vacuum chamber (VC) was developed (cross section). The VC consists of a high-V kenotron rectifier, a high-V transformer, and a condenser. The weldment serves as the anode, a heated W spiral as the electron-emitting cathode; the electron beam is focused by a lens and directed onto the weldment by a deflecting system. To date, such WG has been performed on thicknesses of a few mm, but WG of significantly thicker parts appears possible. Electron-beam vacuum welding affords lower and more uniform hardness and greater plasticity to a weld. Desirable improvements are listed. Ultrasonic (US) WG of metals: US WG of metallic and nonmetallic materials appears promising, but neither the technology nor even the physics of the phenomenon are sufficiently understood. Thin (1.5-mm) parts can be thereby

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welded together and onto thicker parts. The temperature of the metal parts rises rapidly upon application of US, attains a maximum after about 0.5 sec, and drops after achievement of the weld. 0.1 +0.1-mm parts require but 0.20-0.25 sec. The MVTU and MEI explored US-WG processes of brass 0.25+ 0.25 mm, austenitic stainless steel 0.1 + 0.1 mm, the aluminum alloys АМГ-6Т (AMG-6T) 0.5 + 0.5 mm, Д16АТ (D16AT) 0.3 + 0.3 mm, АМЦ (AMTs) 0.5 +0.5 mm, Zr 0.1 +0.1 mm, steel 1Х18Н9Т (1 Kh18N9T) + Zr 0.5 +0.1 mm. The US WG of the Al alloys is of especial interest for aircraft production because of the lower temperatures involved and the simpler equipment required for it. Strength data on Al-clad D16AT show a jumplike increase in strength at high WG pressures, when apparently the cladding is pierced and a stronger WG contact is established between the two parent-metal layers. A full-page table provides strength data for welds in 12 different metals. The tensile strength of the weldspots ranges from 25-75% of their shear strength. Some lowering in strength in the parent metal by the US weld spots is indicated by test data. The weld spots are sensitive to stress concentration. The fatigue strength (FS) of the spots is lower than their static strength but no lower than the FS of contact-welded joints. US WG is readily automated; it exerts only a minimal thermal effect on the welded parts. It appears most promising in the welding of thin parts, in which it competes with contact welding. US WG of plastic and polymers: US WG is suitable for thicknesses from 0.01 to 10 mm, including lap, Tee, and other joints. The US stresses induced in plastic are normal, as contrasted

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with the tangential stresses required for metals WG. Thermoplastics alone can be welded successfully. Projected areas of application: Electrotechnical and chemical industry, building. The effect of US on welding baths: Preliminary findings at the Institute of Metallurgy, AS USSR, the Scientific Research Institute for Production Technology and Organization, the MVTU, and the MEI indicate that US exposure improves the density, uniformity, and strength of welded joints. US reduction of residual stresses and strains in structures: MVTU and MEI measurements on beads welded onto the edges of steel strips 3 mm wide indicate a 50% reduction in residual stresses and strains upon US exposure, probably through stress relaxation. Post-welding deformation of many alloyed steels, attributed to decomposition of retained austenite, has also been shown to be substantially reduced by US exposure. It is premature to speak of immediate practical applications. However, if practical uses are found, it is apparent that US methods lend themselves readily to mechanization and automatisation. There are 11 figures and 1 (unnumbered) table; no references.

ASSOCIATION: None given.

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S/122/62/000/001/001/005
D221/D304

AUTHOR: Nikolayev, G.A., Corresponding Member of Academy of Construction and Architecture USSR, Doctor of Technical Sciences, Professor

TITLE: Improvement of welding industry - an important direction of technical progress

PERIODICAL: Vestnik mashinostroyeniya, no. 1, 1962, 3-10

TEXT: The Seven-Year Plan envisages a two-fold increase of welding. Automation is to be increased as follows: Spot welding-2.5 times, electro-slag methods - 2 times, and gas electric welding 6 times. At present, arc welding under flux is the most widely used automatic process in engineering. In designs subject to static loads it is expedient to apply the gun through-welding under flux. Development of the corresponding equipment is directed towards the use of a self-adjusting arc developed by the Institut elektrosvarki im. Ye. O. Patona (Institute of Electric Welding im. Ye. O. Paton). Multi-arc heads using even three-phase

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current are manufactured. A high ratio of seam build-up and good mechanical properties are ensured with protective atmospheres. Non-melting tungsten electrodes are employed for welding aluminum or other non-ferrous metals in inert gases. The introduction of welding in protective atmosphere requires generators with stable volt-ampere characteristics. The author points to the need for improving semi-automatic units, as well as the development of tracer controls. Special chambers with inert gas are designed for welding active metals, such as zirconium, alloys of molybdenum etc., Mention is made of units for welding in a protective atmosphere developed by MVTU im. Baumana (MVTU im. Bauman): semi-automatic ПГА-2М (PGA-2M); mobile sets ТС-1 (TS-1), automatic ТСГ 5 (TSG-5) АСТ-4 (AST-4); set for welding pipe joints ТСГС-1 (TSGS-1); and finally an automatic unit with tracer control for curvilinear welds. Further development in this line by the Institute of Electric Welding im. Ye. O Paton envisages electrode wire with special powder pressed into it. Improvement of the automatic electro-slag welding of austenitic steels and heat resisting alloys is planned. Steps are to be taken

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to eliminate residual stresses, as well as maintenance of sizes, and reduction of heat treatment. Automatic metal covering under flux, which is 5 times more productive than manual metal spraying, is given priority. Tape electrodes are then used. The output of spot welders in the current Seven-Year Plan is to be increased 4.5 - 4.7 times, and that of special units - 7.3 times. The cost of spot welders in 1957 was 37% of the total cost, whereas in 1965 it is to be 50%. Condenser units for accurately measuring energy for welding are of importance. Some were developed by MVTU im. Bauman. Advances were made in complex spot welders by the Welding Institute in Bratislava (Czechoslovakia). Welding seams are inferior to spot welds as far as variable loads are concerned. The fatigue strength of austenitic steels, aluminum and titanium alloys is then greatly affected. Large structures are welded by a portable machine МГПГ-500 (MGPG-500) with a 3100 mm jaw capacity. An example is given of a 200 m long crawling conveyor for the assembly and welding of the electric locomotive frame, and the flow line for "Volga" automobile at the Gor'kovskiy avtomobil'nyy zavod (Gor'kiy Automobile Factory). The new welding methods include the use of radio frequency currents, as

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well as application of the electronic beam welding in special vacuum chambers. Cold welding by plastic deformation was developed. MVTU-MEI and other organizations are designing equipment for ultrasonic welding, especially of plastics. Roll burnishing to increase the strength of welds is being pursued, and the MPP-2 (MPR-2) machine made by MVTU im. Bauman is illustrated. The author stresses the insufficiency of application of theoretical investigations for automation of welding. There are 9 figures.

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