ACC NR: AT6033996

factors: (a) in actuality, parameter s does not remain constant for a given stream, (b) effect of the sporadic background and possibly other streams, (c) meteors that have different velocities are taken into account, (d) the threshold-signal power varies; the total value of Δs does not exceed $\pm 10\%$; hence, the measurement error is under 10%; (2) For the stream of Quadrantids, p(s) and N(s) decrease with increasing s; (3) Distributions p(s) and particularly N_1(s) and N(s) for the streams of Perseids have two distinct maxima which correspond to $s = 1.50$, $s = 1.80$ for 1957 and $s = 1.40$, $s = 1.80$ for 1958; on the whole, the distribution is compact; (4) A less compact distribution corresponds to the stream of Geminids; (5) Functions p(s) and N(s) of the sporadic background clearly differ from p(s) and N(s) that correspond to the streams. Orig. art. has: 2 figures, 1 formula, and 2 tables.

SUB CODE: 03 / SUBM DATE: none / ORIG REF: 002 / OTH REF: 001

Card 2/2

ACC NR: AR6035292 SOURCE CODE: UR/0269/66/000/009/0048/0048

AUTHOR: Fialko, Ye. Y.; Moysya, R. I., Mel'nyk, V. I.; Kolomiyets', H. I. -- Kolomiyets', A. R.; Yemel'yanov, I. M.; Shul'ha, A. I.; Yavlins'kyy, A. Ya.

TITLE: Radar set for observing the drift of meteor trails

SOURCE: Ref. zh. Astronomiya, Abs. 9.51.411

REF SOURCE: Visnyk Kyyivs'k. un-tu. Ser. astron., no. 7, 1966, 69-74

TOPIC TAGS: meteor trail, radar antenna, radar meteor observation, train drift

ABSTRACT: A description is given of a radar set designed at the Department of General Radio Engineering of Kiev University and which is intended for measuring the velocity and direction of the drift of ionized trains. The basic parameters of the equipment are as follows: frequency 34.47 mc; transmitter pulse power 100 kw; pulse duration 10 μsec; sending frequency 500 cps; each fifth pulse is doubled; receiver sensitivity $\sim$ 3 μv; receiver passband 600 kc. Identical type wave-duct five-element antennas are used for reception and transmission measurements of the drift velocity radial component is carried out by the pulse-coherent method. The

Card 1/2 UDC: 523.164.85

ACC NR: AR6035292

unit is equipped with a system of noise protection which makes it possible to select reflected signals on the basis of duration, amplitude and code. The equipment was tested in March—May 1964. Article includes a bibliography of 6 titles. V. Lebedinets. [Translation of abstract]

[DW]

SUB CODE: 03, 09/

Card 2/2

Fialko, Yu.I.

AUTHOR: Fialko, Yu.I. 21-6-4/22

TITLE: Investigation of Bending and Torsional Oscillations of Turbomachine Vanes in a Gas Current (Issledovaniye izgibno-krutil'nykh kolebaniy lopatok turbomashin v potoke gaza)

PERIODICAL: Dopovidi Akademii Nauk Ukrains'koy RSR, 1957, No 6, pp 548-551 (USSR)

ABSTRACT: A new method for computation of free and forced bending and torsional oscillations of vanes has been developed. This method makes it possible to take simultaneously into account the following factors: centrifugal forces; the angle of setting; the natural twisting; bending oscillations along the greatest rigidity direction; the effect of transverse forces and inertia of rotation; the intrinsic damping; the aerodynamical energy dissipation; disturbances caused by the constant component of the current; aerodynamical harmonic perturbing forces and momenta caused by the variable component of the current, - and forces and momenta of inertial forces and momenta of inertial forces of interaction between different kinds of oscillations. The solution of the problem in case of constant oscillations is reduced to integration of the system of differential equations derived by the author. This

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Investigation of Bending and Torsional Osciallations of Turbomachine Vanes in a Gas Current

solution is carried out by the method proposed by A.L. Gol'-denveyzer (Ref. 1) in the form of asymptotic expansion. An example is given which shows that a current, at a velocity equal to 0.9 of the critical velocity of flutter, increases the amplitude of oscillations and dynamic stresses (by 53% in the example cited).
The article contains 3 graphs and 5 Slavic references.

ASSOCIATION: Kiyev Polytechnic Institute (Kyivs'kyy politekhnichnyy instytut)

PRESENTED: By G.N. (H.M.) Savin, Member of the AN Ukrainian SSR

SUBMITTED: 26 March 1957

AVAILABLE: Library of Congress

FIALKO, Yu.I. (Kiyev)

Effect of a gas current on the resonance frequency of forced vibrations of a beam. Prykl.mekh. 9 no.2:220-222 '63. (MIRA 16:3)
(Beams and girders—Vibration)

FIALKO, Yu.I., Cand Tech Sci-- (diss) "Study of the forced oscillations of turbo-compressor blades in a stream." Kiev, 1954. 15 pp (Min of Higher Education UkSSR. Kiev Order of Lenin Polytechnic Inst. Chair of Theoretical Mechanics), 150 copies (KL, 43-58, 117)

FIALO, Yu.I., assistent

Asymptotoic interpration of equations for transverse vibrations of rods of variable cross section. Nauch.dokl.vys.shkoly; stroi. no.3: 58-62 '58. (MIRA 11:7)

1. Rekomendovana kafedroy teoreticheskoy mekhaniki Kiyevskogo politekhnicheskogo institute.
(Elastic rods and wires--Vibrations)

SENCHENKO, I.F.; KUDRYASHOV, M.G.; FIALKOV, A.A.; MIFTAKHOV, F.V.; KATSNEL'SON, I.A.

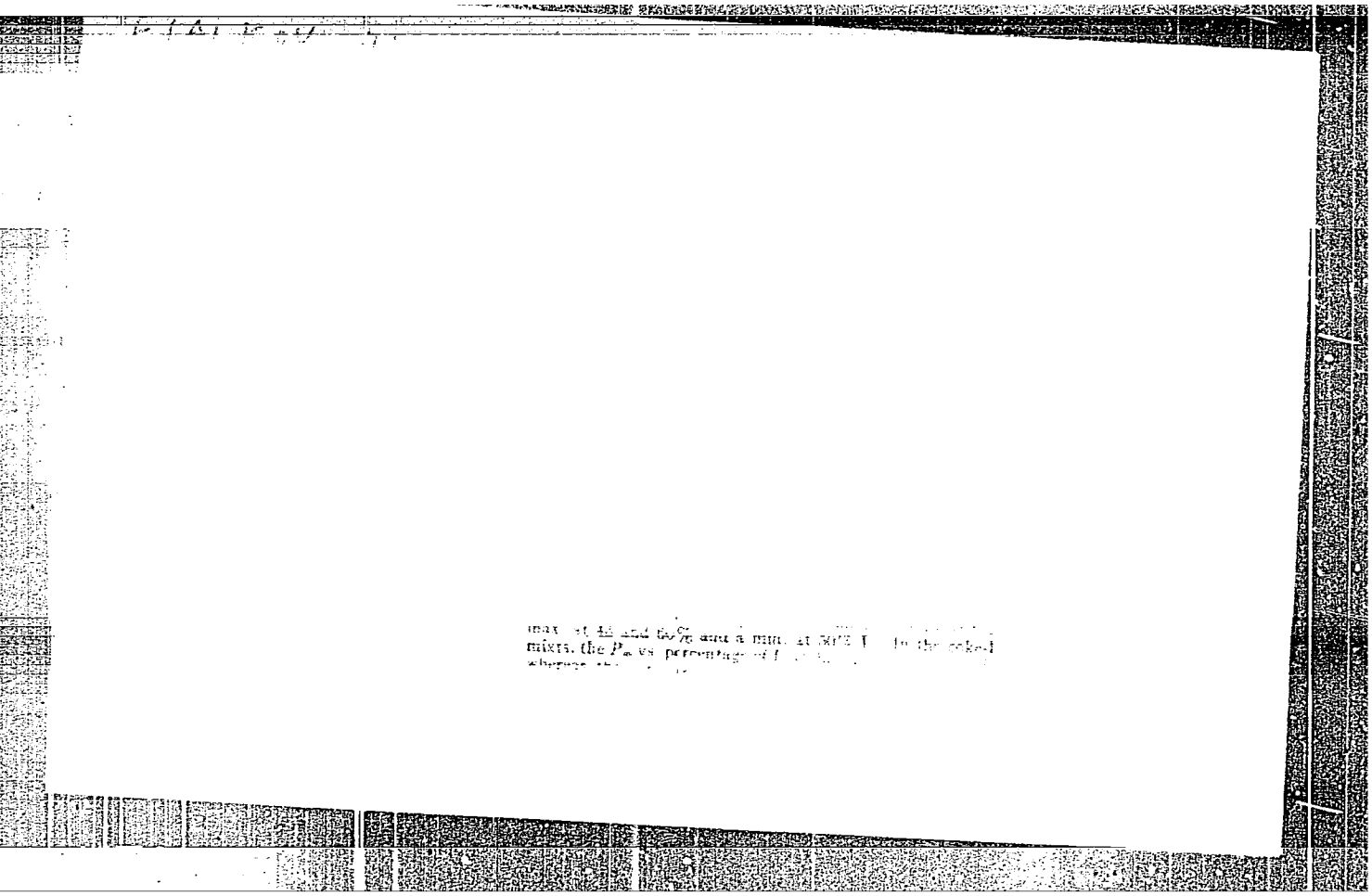
Specialization of building organizations in power-station construction. Prom.stroi. no.10:24-27 '62. (MIRA 15:12)

1. Vsesoyuznyy institut po proyektriovaniyu organizatsiy energeticheskogo stroitel'stva.
(Electric power plants) (Construction industry)

FIALKOV, A. S. (Engr)

FIALKOV, A. S. (Engr) -- "Jet Pressing of Metallographic Bars," Sub 22 May 52, Moscow Order of Labor Red Banner Inst of Steel imeni I. V. Stalin (Dissertation for the Degree of Candidate in Technical Science)

So: Vechernaya Moskva, January-December 1952



USSR/Chemistry - Chemical Technology

Card : 1/1

Authors : Fialkov, A. S. and Umanskiy, Ya. S.

Title : Properties of metal-ceramic materials obtained during extrussion pressing

Periodical : Dokl. AN SSSR, 96, Ed. 6, 1213 - 1216, June 1954

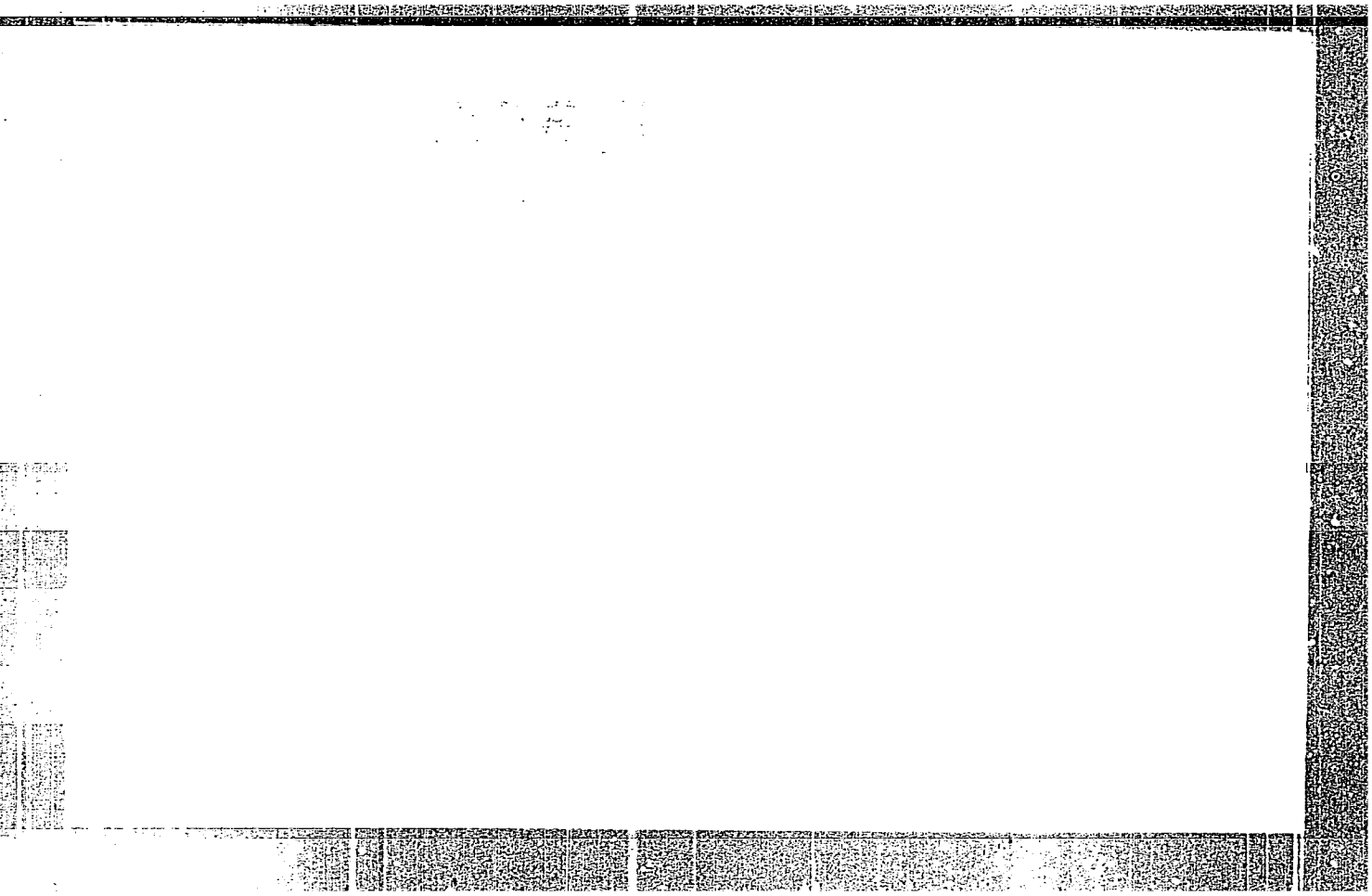
Abstract : A comparison of properties of metal-ceramic materials obtained through extrusion pressing shows that pre-pressing of the powdered mixture is much more effective than the extrusion of a non pre-pressed material having a higher degree of shrinkage. The effect of material shrinkage on the activation of the settling process during calcination is explained by the formation of additional contact points and increase in the nonequilibrium state of the structure during constant relative density of the extruded material. Sixteen references. Table, graphs, illustration.

Institution : ...

Presented by : Academician P. A. Rebinder, March 18, 1954

DAVIDOVICH, Ya.G.; ROZIN, K.M.; FIALKOV, A.S.

An instrument for the measurement of specific electric resistance
Zav.lab.21 no.6:742-743 '55. (MLRA 8:9)
(Electric resistance--Measurement)



APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413010010-1"

FIALKOV, A.S.

AUTHOR: Fialkov, A.S., Davidovich, Ya.G., Kononova, K.V. 32-9-18/43

TITLE: On the Evaluation of the Microstructure and the Microstrength in Carboniferous Substances (Ob otsenke mikrostruktury i mikrotverdosti uglerodistykh materialov)

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 9, pp. 1091-1092 (USSR)

ABSTRACT: The following is a general and short survey. When investigating the microstructure by means of ordinary metal microscopes the distribution of the components with an increase of the order of magnitude of 120 is observed. In order, however, to ascertain the appearance of the carboniferous powder, an order of magnitude increased to 350-400 is necessary. In some single cases the investigation of the microstructure of carboniferous substances does not suffice for the determination of the conditions for the formation of the investigated compositions. In these cases it is useful to apply the method of measuring the microstrength of structural components. Measuring microstrength makes it possible to obtain a more exact structural analysis of the compositions: soot-tar, soot-coke after annealing and tempering. It is shown that the

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On the Evaluation of the Microstructure and the Microstrength in Carboniferous Substances

32-9-18/43

microstrength of annealed samples is three times as great as that of tempered samples. There are 1 figure and 5 references, 4 of which are Slavic.

ASSOCIATION: Scientific Research Institute for Element-Electrocoals (Nauchno-issledovatel'skiy elementno-elektrougol'nyy institut)

AVAILABLE: Library of Congress

Card 2/2

FIALKOV, Abram Samuilovich; BOBYNIN, P.A., red.; BOKUNOV, N.I., tekhn.red.

[Technology and equipment for the manufacture of industrial carbon by electric processes] Tekhnologiia i oborudovanie elektro-ugol'nogo proizvodstva. Moskva, Gos. energ. izd-vo, 1958. 279 p. (MIRA 12:1)

(Carbon--Manufacture)

SOV/110-58-10-5/24

AUTHORS: Fialkov, A.S. (Cand.Tech.Sci.), Davidovich, YA.G. (Engineer) and Kononova, K.V. (Engineer)

TITLE: The micro-structure and micro-hardness of brushes for electrical machines. (Mikro-struktura i mikrotverdost' shchetok dlya elektricheskikh mashin.)

PERIODICAL: Vestnik Elektropromyshlennosti, 1958, No.10. pp. 19-23 (USSR)

ABSTRACT: Various powdery materials are used in the manufacture of a brush and their properties have a considerable influence on its structure. Study of the micro-structure and micro-hardness of brushes can give a good idea about the nature of the constituents and about special features of brush manufacture. The procedure used for polishing brush surfaces for microscopic examination is described. Magnifications of X 120 and X 340 were used and the most typical micro-structures of different kinds of brush material are shown photographically in Figs. 1-7. These figures are then explained: petroleum coke (1) and plates of natural graphite (2) are visible in Fig.1; wood charcoal (1) is seen in Fig.2; the characteristic dendritic structure of copper (1) against a background of graphite (2) appears in Fig.3; and grains of bronze (1) with plates of natural graphite (2) are observed in Fig.4. White grains of silver (1) on a background of graphite (2) are visible in Figs.5a. and b. The influence of pressing in orientating the graphite plates is evident in Figs.5a. and b., which are sections perpendicular to and in the direction of pressing respectively. Fig.6. shows the three

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The micro-structure and micro-hardness of brushes for electrical machines.

micro-structures of brush material of carbon black and coke immediately after pressing, heat treatment and graphitisation. Different types of structure may occur even with a given formulation and method of brush manufacture. This is illustrated in Fig.7. in which the porous, monolithic and normal structures are discerned. Sometimes examinations of micro-structure do not suffice to elucidate the conditions of formation of brush composition, or to identify the constituents. In this case, measurements of their micro-hardness is helpful. The method of making the micro-hardness determinations is then described. Some substances can be examined without special treatment of the surface; the treatment used in other cases is described. In order to investigate the influence of composition on micro-hardness, samples were made which included different proportions of graphite, carbon black, and binder. Each of the formulations was pressed at 1500 kg/cm^2 and then fired. The test results, given in Table 2, show that the micro-hardness of the natural graphite in the various compositions remained unchanged, whilst that of the carbon black altered considerably. The significance of the figures for the different formulations is discussed. Micro-hardness determinations facilitated a fuller analysis of brush structure. There was also some co-relation with brush performance. Brushes grade EG-8 normally have a micro-

The micro-structure and micro-hardness of brushes for electrical machines.

hardness not greater than 60 kg/cm^2, but when the hardness was about 110 kg/cm^2 the performance of electrical machines with these brushes was impaired. There are 8 figures, 2 tables and 10 literature references (Soviet)

SUBMITTED: April 22, 1958.

1. Sliding contacts--Production 2. Sliding contacts--Materials 3. Sliding contacts--Mechanical properties 4. Sliding contacts --Microstructure 5. Sliding contacts--Performance

AUTHORS: Fialkov, A. S., Davidovich, Ya. G., 32-2-49/60

TITLE: The Use of a Conical Plastometer for Controlling the Mixture Quality of Carbon Compounds (Primeneniye konicheskogo plastometra dlya kontrolya kachestva smeshcheniya uglerodistykh kompozitsiy)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 2, pp. 241-243 (USSR)

ABSTRACT: Thementioned plastometer is meant for the investigation of electric materials and etc.It consists chiefly of a cone that penetrates into the test sample by variable dead load. A certain temperature can be fixed by a heating element and a contact thermometer. The test samples are prepared in a press. The investigation method with a conical plastometer was already developed by P.A. Rebinder (reference 1) in order to investigate the tangential stress. The conus penetrates into the test samples more and more slowly so that the penetration depth forms a certain function with the duration of the penetration (graphical representation). By a formula the tangential stress can be calculated. The test results show that for instance even a 6% addition of

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The Use of a Conical Plastometer for Controlling the Mixture Quality of Carbon Compounds 32-2-49/60

the binding agent to the carbon reduces the measuring results 8 fold, which proves the susceptibility of this method. There are 3 figures, 2 tables, and 1 Slavic reference.

ASSOCIATION: Branch of the Scientific Research Institute for Electro-Carbon Elements (Filial nauchno-issledovatel'skogo elementno-elektrougol'nogo instituta)

AVAILABLE: Library of Congress

1. Carbon compounds-Test methods

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110-58-5-6/25

AUTHORS: Fialkov, A.S., Candidate of Technical Sciences and Livshits, P.S., Engineer.

TITLE: Problems in the Production of Electrical Brushes (Nekotoryye voprosy proizvodstva elektroshchetok)

PERIODICAL: Vestnik Elektropromyshlennosti, 1958, Vol 29, Nr 5, pp 18 - 22 (USSR).

ABSTRACT: To meet present requirements, brushes must have improved commutating properties, must be capable of operating at higher speeds and current-densities and must resist wear. The commutating properties of a brush depend on its structure. Natural graphite compositions are the worst in this respect; the best are disperse carbonacious materials of the type of carbon-black or wood charcoal powder. A series of carbon-black/graphite brush materials has been developed to give brushes with a range of commutating properties. They are used in blooming mill generators but although commutation is improved the brushes have a short life and it is becoming important to reduce the wear of brushes.
Much can be achieved by the use of appropriate binders in combination with carbon-black. Brush wear can also be reduced by improving the commutator surface; an effective way of

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doing this is to use the so-called lubricating brushes of natural graphite, which give the requisite special finish to the commutator. Thus, brushes of the type required to give good commutating properties are used in combination with others that help to form the commutator surface. This arrangement is described at some length.

It is important to be able to run brushes at higher commutator surface speeds. Reduced mechanical friction losses and a lower natural frequency of vibration of the brushes are also desired. To do this it is helpful to reduce the pressure on the brushes and to make them lighter in weight. Light-weight brushes can be made of porous materials. Tests have been made on trial samples of brushes working on commutators with peripheral speeds of some 40 - 50 m/sec. At present, current densities in sliding contacts are governed by standard rules which set current-density limits for particular grades of brushes. . The current density rises from 6 A/cm^2 for pure carbon compositions to 20 A/cm^2 for brushes containing metal. As the current density is increased the total contact surface is reduced. The mechanical losses fall and the electrical losses rise.

Problems in the Production of Electrical Brushes

Consequently, the total loss curve has a minimum value and is of the shape shown in Fig.1.
Temperature limitations on brushes are usually imposed not so much by the brushes themselves as by the other materials used in the machine. In particular, it may not be possible to maintain the requisite finish on the commutator if the brushes are not of suitable composition. Brushes are made that are able to work at commutator surface temperatures of 120 - 180 °C. Brushes of particularly good mechanical properties are required for electric traction applications. Recent developments in this field have called for improved brushes. One type of material that meets the new requirements is grade EG-2P-2. Its special feature is that the basic coke-graphite structure is very porous. These pores are impregnated with carbonacious substance, which is stoved to form a further coke basis linked with the first one. The resulting material is very strong.
The operating properties of brushes are improved if they are worked in an inclined rather than a radial position.
Inclined brushes are widely used in equipment for aviation, automobiles and tractors but, in general, the electrical

engineering industry underestimates the importance of this factor. Another and very effective measure is to use a sectional construction in which the brush is sub-divided. Graphs of zones of sparkless operation when using solid and sub-divided brushes on a machine are shown in Figure 2. Considerable improvement results from sub-division and the true area of sliding contact is increased.
A number of constructions of brushes are illustrated in Figure 3. A further possibility is to use sub-divided brushes in which different parts are made of different materials; the leading edge is made of natural graphite and the trailing edge of hard carbon-black composition. This gives the same effect as mixed arrangements. Very often, considerable improvement can be effected without changing the brush-holders. There are 3 figures and 3 references, 1 of which is French and 2 German.

ASSOCIATION: Branch of NII EP

SUBMITTED: April 19, 1957

Card 4/4

FIALKOV, A.S., kand. tekhn. nauk.; DAVIDOVICH, Ya.G., inzh.; KONONOVA, K.V., inzh.

Microstructure and microhardness of brushes for electric machinery. Vest.elektroprom. 29 no.10:19-23 O '58. (MIRA 11:11)
(Brushes, Electric)

SOV/136-59-3-13/21

AUTHORS: Fialkov, A.S. and Temkin, I.V.

TITLE: Prospects for the Application of Vibration Grinding in the Production of Finely-dispersed Coal-graphite Materials (Perspektivy primeneniya vibropomola v proizvodstve tonkodispersnykh uglegrafitovykh materialov)

PERIODICAL: Tsvetnyye Metally, 1959, Nr 3, pp 53 - 60 (USSR)

ABSTRACT: The authors give three flowsheets (Figures 1a, 6, 2) used for the production of highly dispersed coal-graphite materials. They have previously (Ref 4) considered a quicker method (Figure 1, B) in which grinding is combined with mixing through the application of variable-sign loads (frequency up to 50 Hertz) to the material. They now describe their investigations in this field, in which Ye.B. Beletskaya and V.T. Kolosok, Engineers, participated. Different combinations of materials with binders (compositions given in Table 1) were tested, a laboratory-type M-10 vibro-mill being used. The proportion of 0 - 10 μ material, which was used as the criterion of comminution, was determined by sedimentation (Ref 8) (the Rosin-Rammler empirical equation was also used). The comminution vs time curve for various

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materials, including natural Noginsk graphite, are shown in Figure 2. Unroasted oil-cracking coke was the easiest to grind, pyrolysis oil roasted coke the hardest. Rosin-Rammler plots (Figures 3 and 4) show that the size grading is practically independent of grinding time but varies with the nature of the initial materials. Figure 5 shows the dependence of the absorption of non-polar paraffin, the nominal specific surface and the bulk density (Curves A, B and C, respectively) on grinding time. With lamp-black a breakdown of the chain structure occurs (Figure 6 shows electron photographs X 7000 of specimens before and after grinding). With high-temperature, char viscosity decreased during grinding (Table 2) due to a mechanical-chemical effect (Refs 10, 11). Graphitised specimens were prepared from various mixtures by methods involving the various flowsheets and their physical and mechanical properties were determined. The properties obtained with the authors' flowsheet were generally superior (Table 3). This flowsheet was used

Prospects for the Application of Vibration Grinding in the Production of Finely-dispersed Coal-graphite Materials

with industrial-scale mills (200, 400 and 1 000 litres capacity) with a process cycle of 15 days: the scale effect had little influence on the properties (Table 4) and thus tests with small samples of raw materials can be used for arriving at optimal compositions. The method is suitable for high-temperature char with a softening temperature over 120 °C.
There are 7 figures, 4 tables and 11 references, 7 of which are Soviet and 4 German.

26.1510
9.4160 (and 2804, 1331)

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S/110/60/000/007/003/005
E073/E535

AUTHORS: Iosif'yan, A.G., Academician of the AS ArmSSR, Fialkov, A.S., Candidate of Technical Sciences, Davidovich, Ya.G., Engineer, Kuchinskaya, O.F., Engineer and Petrosyan, L.S., Engineer

TITLE: Field Investigations of Solar Batteries

PERIODICAL: Vestnik elektropromyshlennosti, 1960, No.7, pp.38-43

TEXT: The results are described of field investigations on photoelectric transducers which were carried out between August 21 and September 21, 1959 in the region of Byurakan (Armenia) at an altitude of 1800 m above sea level. The electron-pole transitions in the photo-elements were produced by thermal diffusion, accompanied by the formation of a naturally transparent film on the surface of the photo-elements (S.G. Zaychikov and T.V.Lysenko participated in developing this method). The investigations were carried out on a battery consisting of 28 series-connected sections, each of which contained parallel-connected elements glued onto an insulated base. The sections were on a frame mounted on equipment which was orientated automatically to face the Sun. The working

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Field Investigations of Solar Batteries

surface could be protected by a removeable glass. Soldered leads were available for measuring the characteristics of the individual sections. The electric parameters were measured by class 0.5 instruments; the temperature of the ambient air (in the shade) and of the objects of investigation were recorded by an automatic instrument. To clarify the influence of temperature on the characteristics of the individual photo-elements, a set-up was used for cooling the photo-elements down to +10°C and heating to +160°C, whilst maintaining unchanged the natural illumination of the Sun. The changes in the characteristics of the battery and of its individual sections as a function of the intensity of the incident radiation during the day were recorded continuously, using a thermoelectric actinometer with a galvanometer and an albedometer. Experiments were also made to assess the possibility of concentrating the light flux onto the surface of photoelectric transducers by means of mirrors, using for this purpose a battery on an insulated panel provided with hinged flat mirrors. The influence of meteorological effects over long periods on the operation of photo-elements

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was studied on a separate set of two batteries, whose surfaces remained unprotected for the entire period of the investigations. The electric characteristics of some separate elements and of an hermetically-sealed battery submerged in water were also investigated. For all the investigated batteries and their elements a general technique was applied for determining the basic characteristics which are necessary for evaluating their effectiveness. The graph, Fig.2, shows the operating part of the volt-ampere characteristic of one element under an illumination intensity of 0.0925 W/cm^2. The useful area of the element equalled 3.64 cm^2; the measurements were carried out at 35°C. Under optimum loading the element supplies a maximum power of 316 mW and its efficiency was 9.36%. In almost all elements the optimum load corresponds approximately to two-thirds of the no-load voltage. For determining the effectiveness of the element it is sufficient to find three characteristic points on the load curve, namely, the no-load voltage, U_{xx}, the short-circuit current, I_{kz}, and the current and voltage for the optimum load, I_H and U_H. A

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convenient parameter for evaluating the quality of a photoelectric element is the coefficient of filling of the load curve, k_H, representing the ratio of the maximum power in the case of optimal loading to the product of the no-load voltage and the short circuit current:

$$k_H = \frac{U_H \cdot I_H}{U_{x.x} \cdot I_{K3}}$$

At the optimum voltage, the maximum value of k_H is 0.7. During the experiments the temperature of the ambient air fluctuated between 15 and 45°C; the temperature of the battery was always higher, and fluctuated between 20 and 60°C. In most cases a lower temperature corresponded to a lower intensity of solar radiation. The short-circuit current increased with increasing temperature up to 100°C and then decreased sharply. k_H decreased insignificantly up to 100°C and then decreased sharply; the efficiency at 100°C was about 50% lower than at 30°C and at 160°C it dropped to almost zero. With increasing intensity of the solar radiation k_H decreased.

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Differences in values obtained for the same temperature range during certain days are attributed to increasing losses due to resistance in the battery with increasing intensity. Comparison of data obtained in various temperature ranges for an equal zenith distance indicates that k_H decreased sharply. The change in the spectral composition had little effect on k_H, which is attributed solely to an increase in the temperature. The efficiency at an operating temperature of 45 to 50°C is about 8% lower than in the temperature range 35 to 40°C. By using mirrors with an area about 1.5 times larger than that of the solar battery, a twofold increase of the output was achieved. Protective glass reduces the conditions of heat transfer from the surface and raises the operating temperature by 20 to 30°C. Furthermore, the losses due to absorption of the glass are about 10%. A naturally transparent film permits of an efficiency about 25% higher than can be obtained if perspex is used. Submersion in water to a depth of 5 to 40 cm brought about a considerable drop in the short-circuit current, to about one-sixth at a depth of 40 cm. The no-load voltage remained unchanged up to a depth of 40 cm. The characteristics were fully maintained if the

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elements were submerged to a depth not exceeding 0.5 cm. Exposure to weather did not result in any appreciable deterioration during the entire duration of the tests. The obtained temperature-dependence of the e.m.f. confirmed the known dependence according to which the e.m.f. drops with increasing temperature at a rate of 0.00288 V/°C. Cooling is particularly important when there is concentrated illumination over long periods. In the case of low-intensity radiation during the morning (10.0 to 15.0 mW/cm^2), a power can be obtained which is equal to that obtained during higher radiation intensities. The results confirm that photoelectric transducers can operate effectively even on relatively cloudy days, and the use of radiation concentrators during such periods will ensure a power output comparable to that obtained during cloudless days. There are 8 figures and 7 references: 5 Soviet and 2 non-Soviet.

SUBMITTED: February 27, 1960

Card 6/6

69466

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S/069/60/022/02/014/024
D034/D002

AUTHORS: Fialkov, A.S., Temkin, I.V., Toporova, V.P.

TITLE: The Effect of Vibro-Disintegration on the Reinforcing Properties of Carbon Blacks

PERIODICAL: Kolloidnyy zhurnal, 1960, Vol XXII, Nr 2, pp 229-232 (USSR)

ABSTRACT: The authors report on a comparative study of the changes in the reinforcing abilities of carbon blacks in dependence on the disintegration of the secondary structure (chains formed by mutually combined black particles). Lamp and gas channel black were crushed in a vibromill and subsequently introduced into a rubber mixture. The blacks were processed in a vibromill of type M-10 (volume of the body - 10 l) with a vibration amplitude of 2.5 mm and a vibration frequency of 25 cycles per second

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The Effect of Vibro-Disintegration on the Reinforcing Properties of Carbon Blacks

under isothermal conditions (25-30°C). Volumetrically the crushed specimens were measured in a dry state and in "Galosha" benzene. The oil values and the conditional specific surface were determined with a photoelectrocolorimeter of the type FEK-M. The table shows that after the crushing process the volume of the blacks diminishes, in the dry state as well as in benzene. The same holds for the oil values. These changes are apparently the result of a thorough--going disintegration of the secondary structure, which is confirmed by the electron microphotographs given on the insert. The disintegration of the secondary structure sets free a considerable number of active centers, which interact with air oxygen. This results in an activation of the blacks (graph in

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D034/D002

The Effect of Vibro-Disintegration on the Reinforcing Properties of Carbon Blacks

Figure 3). The introduction of disintegrated blacks into rubber mixes caused modulus reduction and an increase in the relative elongation of the mixes (graph in Figure 3). An abrupt fall in the breaking strength of rubber mixes was observed in the case of introduction of disintegrated channel black (see table). The authors assume more intense structure disintegration and oxidation as the basis of the observed phenomenon. X-ray analysis of lamp black disintegrated for 16 hours did not reveal changes in the structure of the crystalline particles. Blacks processed in vibromills may be used for special rubber mixes, and also as activators in the granulation of ordinary blacks. There are 2 graphs, 1 set of electron microphotographs on centerfold, 1 table and 6 references, 5 of which are Soviet and 1 German.

SUBMITTED: February 27, 1959

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S/080/60/033/04/38/045

AUTHORS: Fialkov, A.S., Vaslyanina, O.V., Sukhoverkhov, V.F.

TITLE: New Graphitized Electrodes for Spectral Analysis

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 4, pp 972 - 975

TEXT: The use of spectral electrodes of Soviet production leads usually to spectrograms with the lines of B, Si, Mg, Ca, Fe, Cu, Al and Ti, and therefore, they are not suited for the analysis of semiconductor materials. The gaseous method of purification was applied, therefore, which is widely used for the manufacture of graphite for atomic reactors. The active halogens, like chlorine and fluorine, convert ash admixtures into compounds which are completely eliminated at temperatures of 2,000 - 3,000°C. As halogen sources Freon-12, Freon-22 and elemental chlorine were used. It has been shown that chlorination eliminates all impurities except boron. This element is eliminated by fluorine. The best results are obtained, therefore, with a chlorine-fluorine mixture (Freon-12). The probable mechanism of the processes taking place during purification is discussed. A graph of the method proposed is given. There are: 1 table, 1 diagram, 1 graph, 1 photograph and 6 references, 3 of which are Soviet, 1 English, 1 American and 1 Hungarian.

SUBMITTED: October 19, 1959

Card 1/1

15.2250

25935
S/136/61/000/008/001/005
E021/E180

AUTHORS: Fialkov, A.S., Kazakova, O.B., Galkina, N.I., and Temkin, I.V.

TITLE: The influence of surface-active materials on the properties of carbon-graphite materials

PERIODICAL: Tsvetnyye metally, 1961, No.8, pp. 41-46

TEXT: In the first experiments carbon-black with a specific surface area of 15.17 m^2/g, pH of 8.47 and specific resistance of 1440 ohm mm^2/m was used. A 30 g sample was treated with a 1% aqueous solution of the surface active material. The moisture was then removed and the adsorption of pitch by the sample from a solution of pitch in benzol was determined. The results were as follows:

Surface active material	% pitch adsorbed
Untreated carbon black	65
ОП-10 (OP-10) emulsifier	58
ОП-7 (OP-7) emulsifier	57
ОП-4 (OP-4) emulsifier	53
Aerosol 103	53
Sulphanol (Nekal)	51
Alkoman	50

Card 1/ 7

The influence of adding surface active material on the properties of pitch is shown in Table 1. The pitch was coked in a closed porcelain vessel with a gradual heating to 950 °C, followed by holding for 8 hours. The physico-mechanical properties of coke obtained from pitch with different additions of surface active material are shown in Table 2. Fig.1 shows the pore distribution of coke. [Abstractor's note: meaning of $\Delta V/\Delta r$ not explained]. Curve 1 is for coke from untreated pitch; curve 2 for coke from pitch treated with 0.5% oleic acid; curve 3 with 3% oleic acid. It can be seen that the surface-active material results in a structure with finer pores and the quantity of coarse pores decreases. Semi-fabricated components of lamp-black and high temperature pitch were tested and the effect of additions of oleic acid (abscissa %) on the physico-mechanical properties is shown in Fig.3. Curve 1 is the bending strength in kg/cm^2 (left-hand ordinate); curve 2 is the specific electrical resistance in ohm mm^2/m (middle ordinate); curve 3 is the hardness in kg/mm^2. Thus the shielding action of surface active materials on the surface of carbon powders is demonstrated. Additions of surface-active material to pitch result in a finer pored structure of the

The influence of surface-active ...

coke made from it, because of a decrease in surface-tension and viscosity of the pitch. Additions of surface-active material to carbon-graphite mixtures improve the physico-mechanical properties of the carbon-graphite materials.
There are 3 figures, 4 tables and 6 Soviet references.

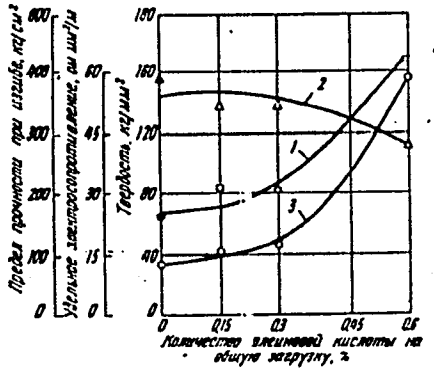

Fig.3

Card 3/7

15 2250
21,2300

25387
S/080/61/034/002/006/025
A057/A129

AUTHORS: Fialkov, A.S., Davidovich, Ya.G.

TITLE: Linear thermal elongation of carbon-graphite materials

PERIODICAL: Zhurnal Prikladnoy Khimii, v 34, no 2, 1961, 300-306

TEXT: The effect of composition and structure of natural graphites from various deposits on linear thermal elongation of carbon-graphite materials was investigated. This problem is important for the determination of the applicability of these materials at high temperatures, since the linear thermal expansion of carbon graphites with crystalline structure shows a marked anisotropy. Thus the linear expansion factor of graphite single crystals perpendicular to the graphite faces is $28 \cdot 10^{-6}$ deg^{-1}, and in the direction of the faces at 600-800°C it is $+0.9 \cdot 10^{-6}$ deg^{-1}. The ratio between these two values can be called anisotropy factor of the linear expansion and should be smaller for polycrystalline carbon-graphite ma-

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Linear thermal elongation ...

terials with no completely expressed three-dimensional order than for single crystals. The present experiments were carried out with mixtures of materials indicated in Table 1 using as binder a pitch (softening point ~76°C) of the Gubakhinskiy zavod (Gubakhinsk Plant). The samples were pressed (1,500 and 2,850 atm), sintered (1,300°C) and the linear thermal elongation measured at temperatures from 20 to 600°C on an apparatus presented in Fig 1. The quartz tube (1) with the sample (2) is inserted in the tubular furnace (3) and the temperature is regulated by an automatic ЛАТР -1(LATR-1) transformer (4). The tube is fixed on a plate (5) which is built in the wall (6). Linear expansion is transmitted by the quartz rod (7) to the indicator (8) which is fixed on a special socket (9). The indicator could be shifted together with the tube (10) by the micrometer screw (11). The temperature was registered by an automatic millivoltmeter of the МСШПР-354 (MSShchPR-354) type. The effect of the density on the linear expansion was studied with sintered samples containing 8.5% Noginsk graphite, 42% petroleum coke and 49.5% binding coke. Linear expansion was measured also on natural graphite powders from deposits in Tayga, Botogol,

Card 2/12

Linear thermal elongation ...

25267
S/080/61/034/002/006/025
A057/A129

Zaval'yevo, Kureyuk, and blast furnace graphite. The effect of the crystallization degree was studied on X-ray patterns (made by K.V. Kononova with an УРС-70 (URS-70) camera and МФ-4 (MF-4) photometer). Quantitative estimations of the graphitization degree (I_{112}/I_{110}) were made using values from F. Keesler, V. Vecerikova, Brennstoff-Chemie, 38, 19/20, 307 (1957), while crystallite dimensions L_c and L_a were calculated by Selyakhov-Scherrer's formula (Ref 5: Ya.S. Umanskiy et al, "Rentgenografiya" ("Radiography"), Metallurgizdat (1951)). The effect of dispersion was studied on Tayga graphite with grain sizes from 45 μ and above. The linear expansion factor was calculated from (l_{t_2} = final dimension of the sample at the temperature t_2, l_{t_1} = initial dimension of the sample at temperature t_1; t_2 and t_1 = temperature between the final and initial temperatures, l_0 = dimension of the sample = mainly the initial dimension is used). Since practically the elongation was measured, equation (1) can be written as: $\Delta l_{t_2} - \Delta l_{t_1} / l_{t_2 - t_1}$ (2) (Δl_{t_2} and Δl_{t_1} = elongation of the sample at temperatures t_2 and t_1,

Card 3/4

respectively, then the relative elongation $\Delta l/l$ is one of the characteristics and if t_0 is the initial temperature, $\Delta\alpha = \Delta l/l_0$. Measurements on mixtures with various carbon black and graphite contents interstrat (Fig 2) that with increasing graphite content α increased in direction of the compression, and decreased in the perpendicular direction. Characteristic change of the coefficient K_α of the anisotropy of linear elongation and of the specific electric resistance K_ρ with increasing graphite content is also observed (Fig 3). It can be seen from Fig 2 that α increases with pressure. Sharp change in α was observed after an additional increase in the density of carbon-graphite samples by a twofold impregnation with coal-tar pitch and skovening (Tab 3). Decrease in dispersity effects a sharp decrease of α (Tab 4). The dependence of α on the degree and thermal treatment of natural graphite powders is visible in Tab 5. An almost linear function of α from the relative intensity of the lines [112] to [110] on X-ray patterns and of crystallite dimensions is observed. The obtained results demonstrate the considerable dependence of α on structure and composition of carbon-graphite materials. At low graphite contents

Linear thermal elongation ...

approximately the same values for K_α and K_ρ can be observed, while at higher graphite contents K_α is much greater than K_ρ. Characteristic changes of α observed in natural graphites of various deposits and thermal treatment can be explained by the fact that with heating to 2,500°C salt impurities are removed and an additional orientation of the crystalline graphite structure occurs. There are 5 figures, 5 tables and 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc.

SUBMITTED: February 3, 1960

Card 5/12

21492 S/020/61/137/004/016/031
B104/B206

24.7700 1143, 1043, 1138, 1160

AUTHORS: Fialkov, A. S. and Davidovich, Ya. G.

TITLE: The p-n -junction in carbon-graphite materials

PERIODICAL: Doklady Akademii nauk SSSR, v. 137, no. 4, 1961, 841-843

TEXT: For carbon-graphite materials the resistivity, thermo-emf and Hall effect have a marked dependence on the temperature of the heat treatment. This is in correlation with changes of the electron- and hole concentrations and the conductivity: a) with the redistribution of the electrons between the π- and σ-bonds as a consequence of the jump of electrons from the π state into the σ state (formation of holes); b) with the change of the number of collectivized electrons in the crystallization of the substance and with the approach of the Fermi levels from the upper limits of the conductivity band; c) with the change of the number and type of defects during annealing; d) with the removal of acceptor-donor impurities through heat treatment. It is pointed out that treatment, production, and type of carbon-graphite materials have a great effect on the above-mentioned factors. According to the temperature of treatment, a change in conducti-

Card 1/5

vity is determined which forms a real premise for the production of p-n -junctions. Investigations were made on carbon elements with 6 mm diameter and 800 mm length, which were produced by pressing a mass consisting of coke from the Khanzhenkovskiy zavod (Khanzhenkov Plant) prepared at 1200°C, lampblack from the Kudinovskiy zavod (Kudinov Plant) and binding agents. Heat treatment was done for five minutes at temperatures from 1200 to 3200°C in argon atmosphere. The specimens had the dimensions 3 • 7 • 28 mm; Hall effect and resistivity were measured in the cold state. The Hall effect was measured with d.c. at a magnetic field strength of 6000 oersteds, the resistivity with separated electrodes. It can be seen from the results shown in Fig. 1 that a maximum p-type conductivity occurs at a treatment temperature of 2200°C. The Hall effect decreases again at a further temperature rise. The authors attributed this decrease to the effect of the stable carbon oxides developed during heat treatment, and they see the possibility of bringing about a further change of the sign of the conductivity. Further experiments on the change of the Hall effect with the temperature of treatment are necessary in order to check this possibility. A two-stage heat treatment at two different temperatures was conducted with the aim of producing a p-n -junction. p-n -junctions could

thus be produced by suitable treatment. The carrier concentration in the range of the p-n -junction, calculated from the measured Hall effect, is graphically shown in Fig. 2. It turned out that the width of the p-n -junction depends on the conditions of treatment. The characteristics of two thermocouples made from suitably treated carbon-graphite material, are shown in Fig. 3. The specimens of 800 mm length had p-n -junctions in the middle. There are 3 figures and 15 references: 4 Soviet-bloc and 11 non-Soviet-bloc.

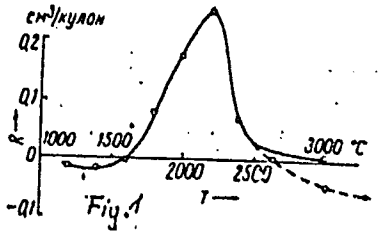
PRESENTED: November 14, 1960, by P. A. Rebinder, Academician

SUBMITTED: November 9, 1960

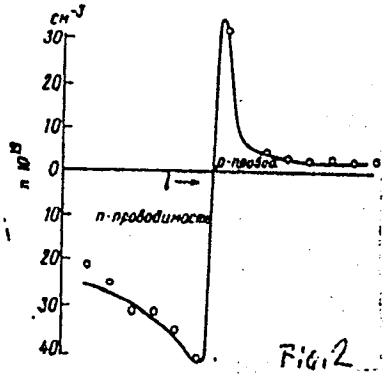
S/020/61/137/004/016/031
B104/B206

The p-n -junction in carbon-graphite...

Legend to Fig. 1: The effect of the treatment temperature on the Hall coefficient



Legend to Fig. 2: Carrier concentration in the range of the p-n -junction



Card 4/5

The p-n -junction in carbon-graphite...

Legend to Fig. 3: Thermo-emf as a function of the temperature of carbon-graphite thermo-couples.

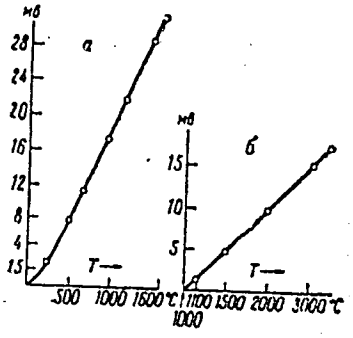


Fig. 3

Card 5/5

NOVIKOVA, Tat'yana Aleksandrovna; FIALKOV, A.S., red.; MISHARINA, K.D., red. izd-va; ISLENT'YEVA, P.G., tekhn. red.

[Copper powders] Mednye proshki. Moskva, Metallurgizdat, 1962. 63 p. (MIRA 15:7)
(Copper) (Powder metallurgy)

FIALKOV, A.S., kand.tekhn.nauk; VIL'KIN, M.A., inzh.

Performance of type VT-5 electric brushes under high altitude conditions. Vest.elektroprom. 33 no.1:44-46 Ja '62. (MIRA 14:12)
(Brushes, Electric—Testing)

FIALKOV, A.S.; GUMILEVSKAYA, G.P.; GRINBERG, M.B.

Modification in the binder in the first stage of sintering of carbon-graphitic materials. Zhur.prikl.khim. 35 no.10: 2308-2313 O '62. (MIRA 15:12)
(BINDING MATERIALS) (GRAPHITE)

FIALKOV, A.S., kand.tekhn.nauk; VIL'KIN, M.A., inzh.

Study of a sliding contact during the operation of brushes on carbon-graphite collectors. Elektrotekhnika 34 no.9:17-20 S '63. (MIRA 16:11)

S/076/63/037/003/007/020
B101/B215

AUTHORS: Fialkov, A. S., Toporov, G. N., Chekanova, V. D. (Moscow)

TITLE: Possibility of regulating the content of functional groups on the surface of carbonaceous powders.

PERIODICAL: Zhurnal fizicheskoy khimii, v. 37, no. 3, 1963, 566-569

TEXT: Coke from petroleum cracking various types of carbon black, natural graphite, and GAY (BAU) carbon were ground in a vibration mill in the presence of air, and were then kept in air at 450° for 2 hrs. Carbon blacks were kept in H_2 at 800°C for 30 min and 900°C for 2 hrs. The content of carboxyl, phenyl, and carbonyl groups was determined. Results: (1) Treatment in the vibration mill increased the content of carbonyl groups considerably. (2) Functional groups containing oxygen are removed completely from the surface of carbon blacks by reduction in an H_2 atmosphere. (3) The content of functional groups in mg - equ per m^2 does not depend on the specific surface. Substances with a small specific surface, such as coke (0.41 m^2/g) showed a high content of functional

Possibility of regulating the content ...

groups. (4) The content of functional groups can be regulated by various thermal and mechanical treatment. There are 3 tables.

SUBMITTED: December 19, 1961

Card 2/2

FIALKOV, A.S.; DAVIDOVICH, Ya.G.; KONONOVA, K.V.; YURKOVSKIY, I.M.

Amorphous state of natural graphite powders. Dokl. AN SSSR 153 no.2:390-393 N '63. (MIRA 16:12)

1. Predstavleno akademikom P.A.Rebinderom.

FIALKOV, A.S.; DAVIDOVICH, Ya.G.; PROFIR'YEVA, G.A.

Interrelation of the physical and mechanical characteristics of carbon-graphitic materials. Zav. lab. 30 no.7:864-868 '64. (MIRA 18:3)

1. Filial Vsesoyuznogo nauchno-issledovatel'skogo instituta elektromekhaniki.

ACCESSION NR: AP4045193

AUTHORS: Fialkov, A.S.; Gumilevskaya, G.P.; Ogareva, N.N.

TITLE: Investigation of the distribution of pores according to their dimensions in coke-binder compositions. Communication I2 in a series of investigations on the forming of pore structures in carbon-graphitized materials.

SOURCE: Zhurnal prikladnoy khimii, v. 37, no. 9, 1964, 1964-2003

TOPIC TAGS: coke, coke binder composition, coke pitch composition, pore formation, pore size distribution, petroleum coke, pitch coke, intermediate size pore, macropore, linear thermal expansion

ABSTRACT: The relationship between pore size distribution and conditions under which they were formed in [illegible] was investigated. The cracked petroleum [illegible] in an electric resistance furnace, the synthesized petroleum coke and the pitch coke powders were heated to 1300C. The coke powders were then mixed at 125C with 30-40 vol.% of coal tar pitch, the 10-0 micron fraction was compressed at 2000 kg/cm^2, heated at 950C and graphitized at 2800C. The distribution of intermediate (about 40-

Card 1/3

L 16139-65
ACCESSION NR: AP4045193

200Å) and macro pores (over 200Å), was determined. The pyrolysed petroleum coke had a much greater volume of intermediate [illegible] and significantly smaller volume of macro [illegible] graphitized coke-pitch composit[illegible] [illegible] dispersed) pore structures. [illegible] and increasing the [illegible] structure was changed to the monodispersed [illegible] particles, [illegible] caused a very rapid increase [illegible] heating [illegible] the [illegible] ments settled, reducing the volume [illegible] coke [illegible]. The linear thermal expan[illegible] that of the heat treated [illegible] was [illegible] volumes of intermediate and macro [illegible] the [illegible] was regulated to some extent by [illegible] coke powders had been heated. [illegible] to increased their open porosity while [illegible] closed [illegible]. Orig. art. has: 9 figures, 1 table and [illegible] equations.

ASSOCIATION: None

Card 2/3

ACCESSION NR: AP4045193

SUBMITTED: 01 Oct 62

SUB CODE: MT

NR REF SOV: 008

ENCL: 00

OTHER: 003

Card 3/3

The dependence of the change of pore structure ... coke ... temperature

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 10, 1964, 2451-2452

TOPIC TAGS: petroleum coke, pore structure, coking temperature, pore dimension

ABSTRACT: The change in the structure ... coked at ... in the 600-3000C range ... increasing the coking temperature ... and the ... between the ... and intermediate pore volume ... ratio of micro- and intermediate ... at ~1000C ...

ACCESSION NR: AP4047984

50 Å radius and intermediate channel-shaped pores [illegible] Å radius
the petroleum coke. On coking to [illegible]
100 Å. The pore size [illegible]
lamellar [illegible]
pus structure of the [illegible]
al orderliness [illegible]

ASSOCIATION: None

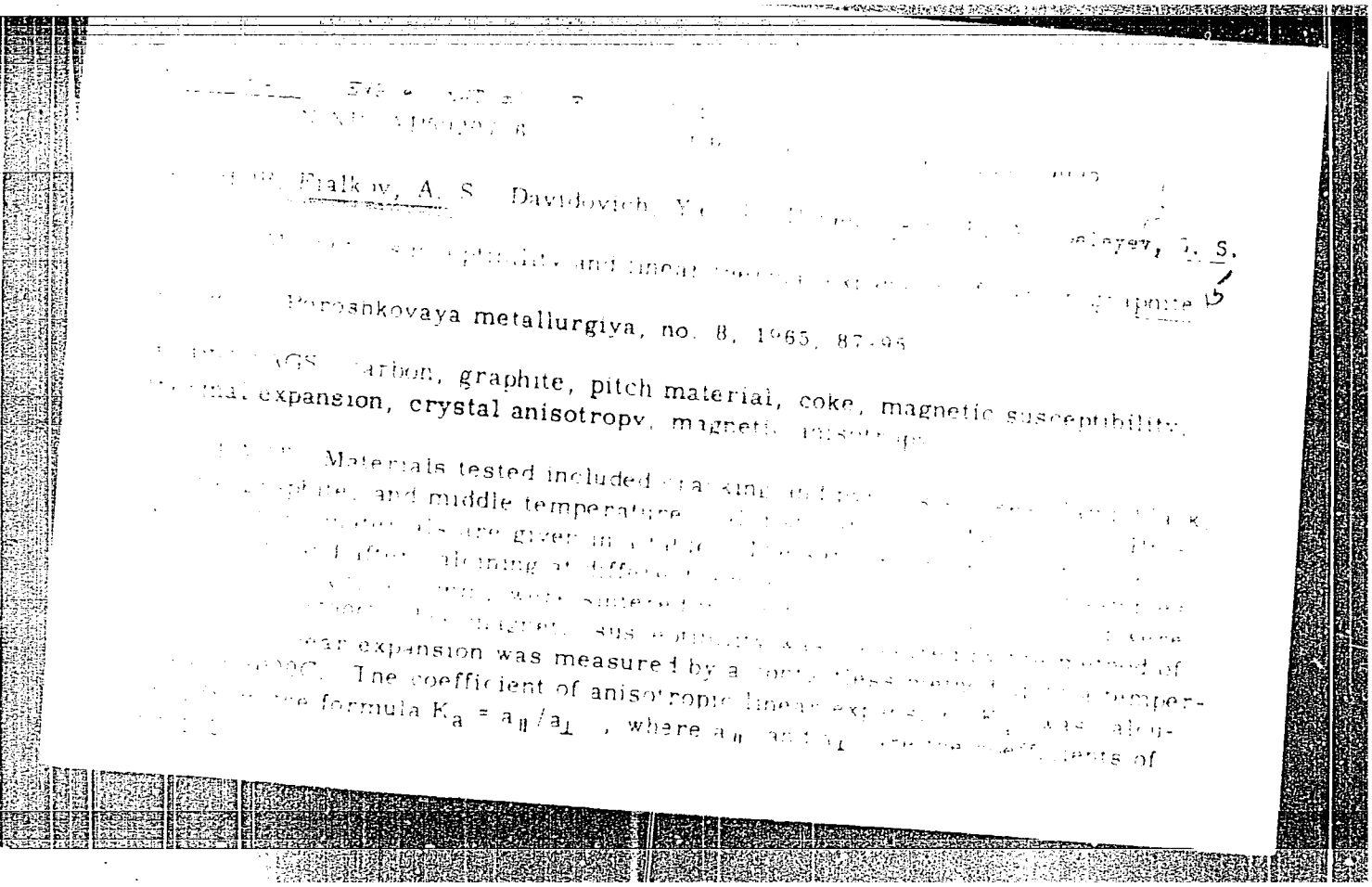
SUBMITTED: 25Aug63 ENCL: 00

SUB CODE: FP, MT NO REF SOV: 00[illegible]

Card 2/2

FIALKOV, Abram Samuilovich

[Forming the structure and properties of carbon and graphite materials] Formirovanie struktury i svoistv uglegrafitovykh materialov. Moskva, Metallurgiia, 1965. 287 p. (MIRA 18:6)



Rialkov, A. S. Davidovich, Y. ... Belyayev, V. S.

... and linear ... of graphite

Poroshkovaya metallurgiya, no. 8, 1965, 87-95

... carbon, graphite, pitch material, coke, magnetic susceptibility, ... expansion, crystal anisotropy, magnetic ...

... Materials tested included ... and middle temperature ... are given in ... heating at ... linear expansion was measured by a ... of ... The coefficient of anisotropic linear ... was ... the formula $K_a = a_{\parallel} / a_{\perp}$, where $a_{\parallel}$ and $a_{\perp}$ ... coefficients of

L 55036-65

ACCESSION NR: AP5020776

expansion measured parallel and perpendicular to the direction of pressing.
ished that the coefficient of anisotropic linear expansion in poly-
graphite materials and
diamag-
expansion of carbon graphite
the
formation of the
was is
materials is discussed

ION: None
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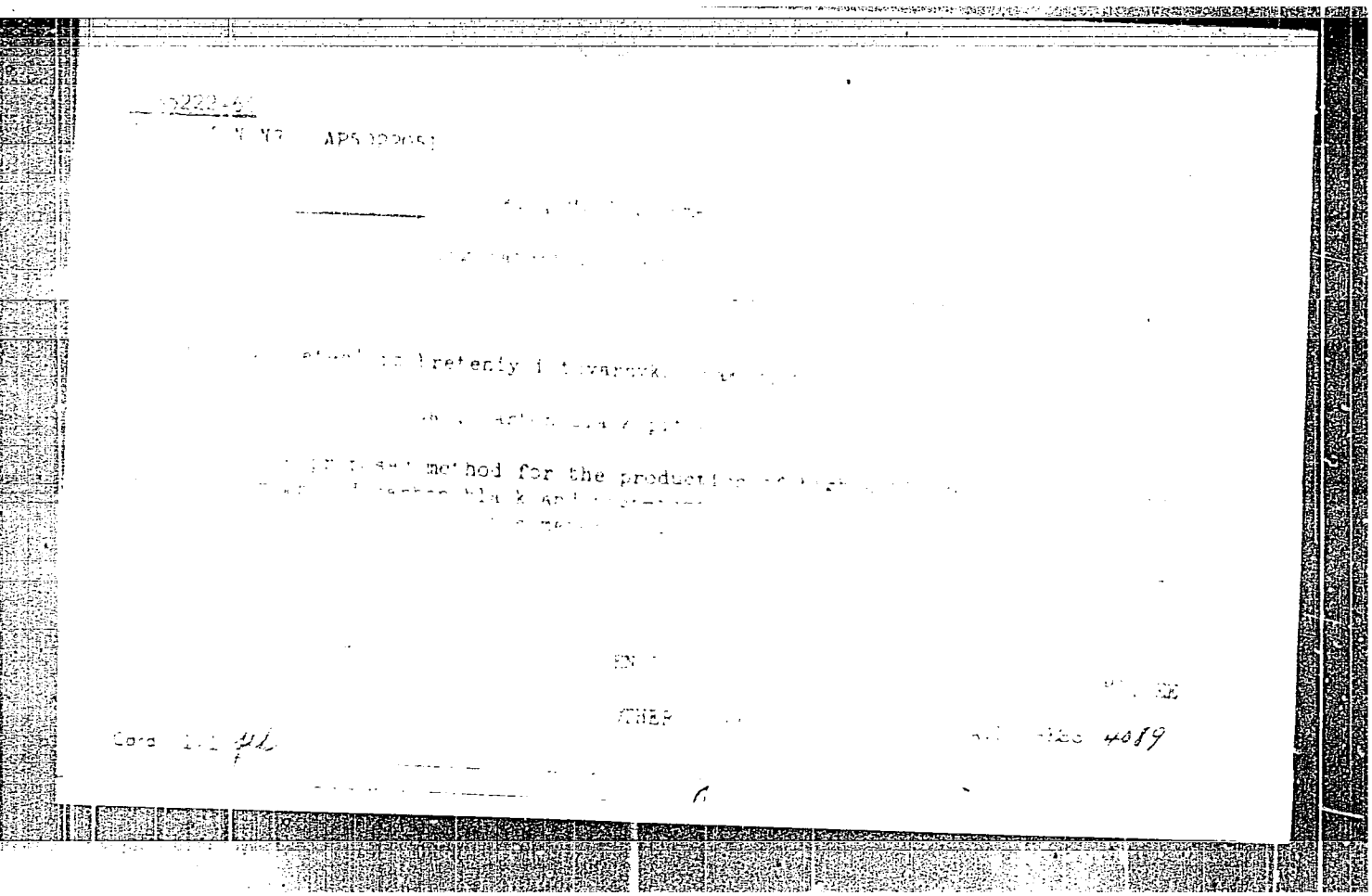
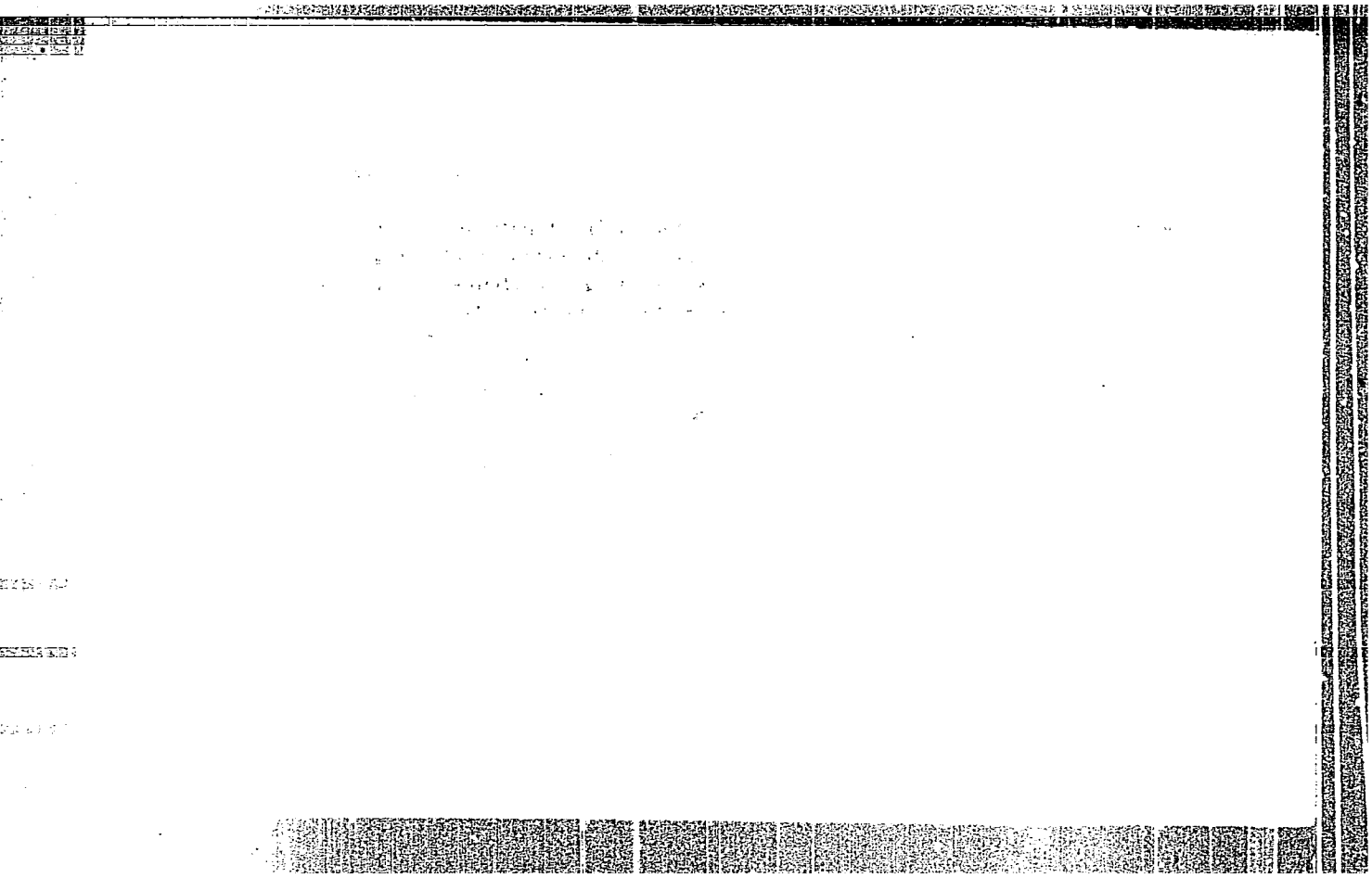
SUB CODE: MM, EM
ENCL: 00
OTHER: 008
NO REF SOV: 001



FIALKOV, A.S.; DAVIDOVICH, Ya.G.; PSHENICHKIN, P.A.; GALEYEV, G.S.

Diamagnetic susceptibility and the linear thermal expansion of carbon graphite materials. Porosh. met. 5 no.8:87-95 Ag '65. (MIRA 18:9)

[redacted] strukturnoy khimii, v. 6, no 1, 1965, 66-69



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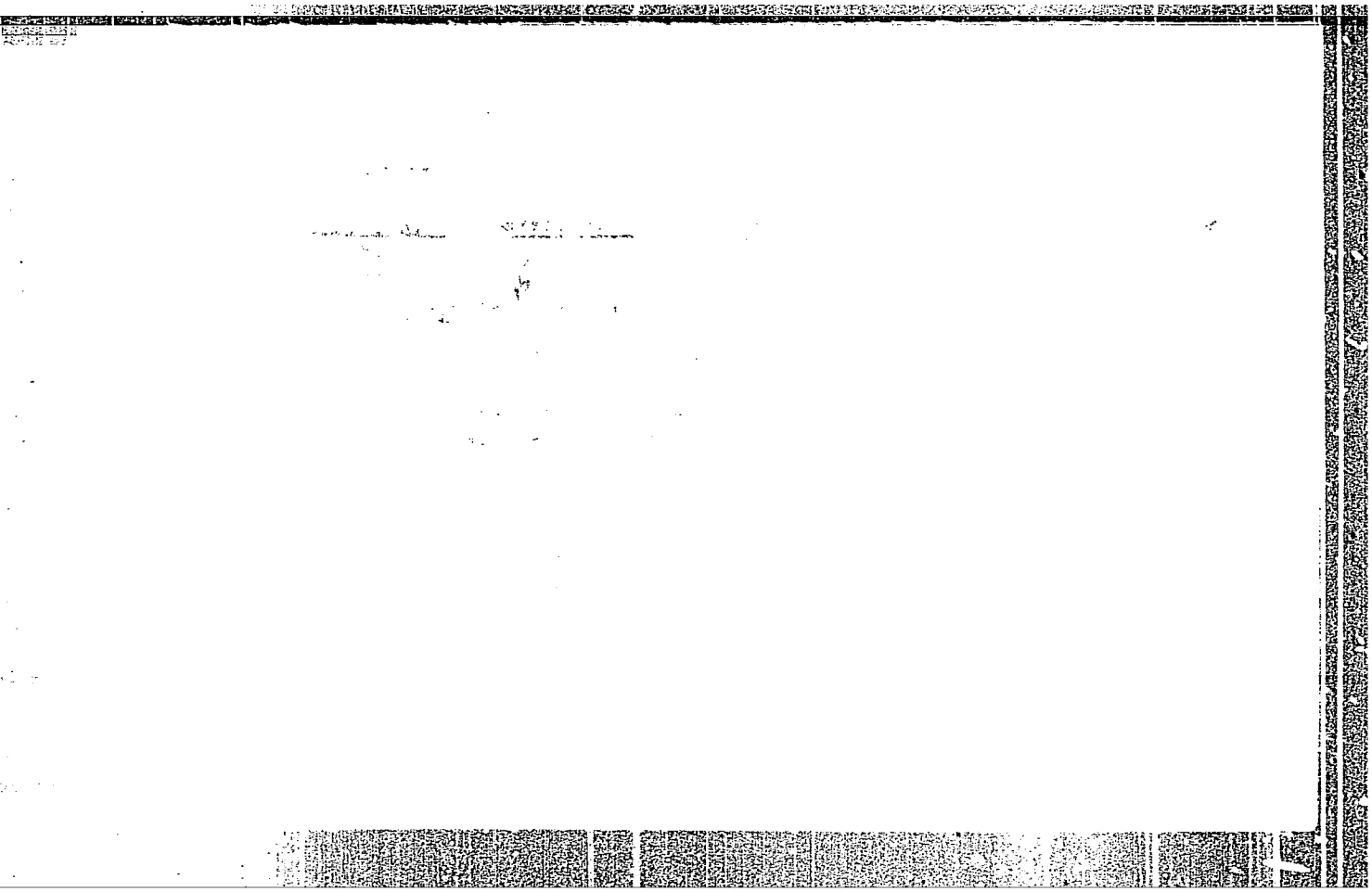

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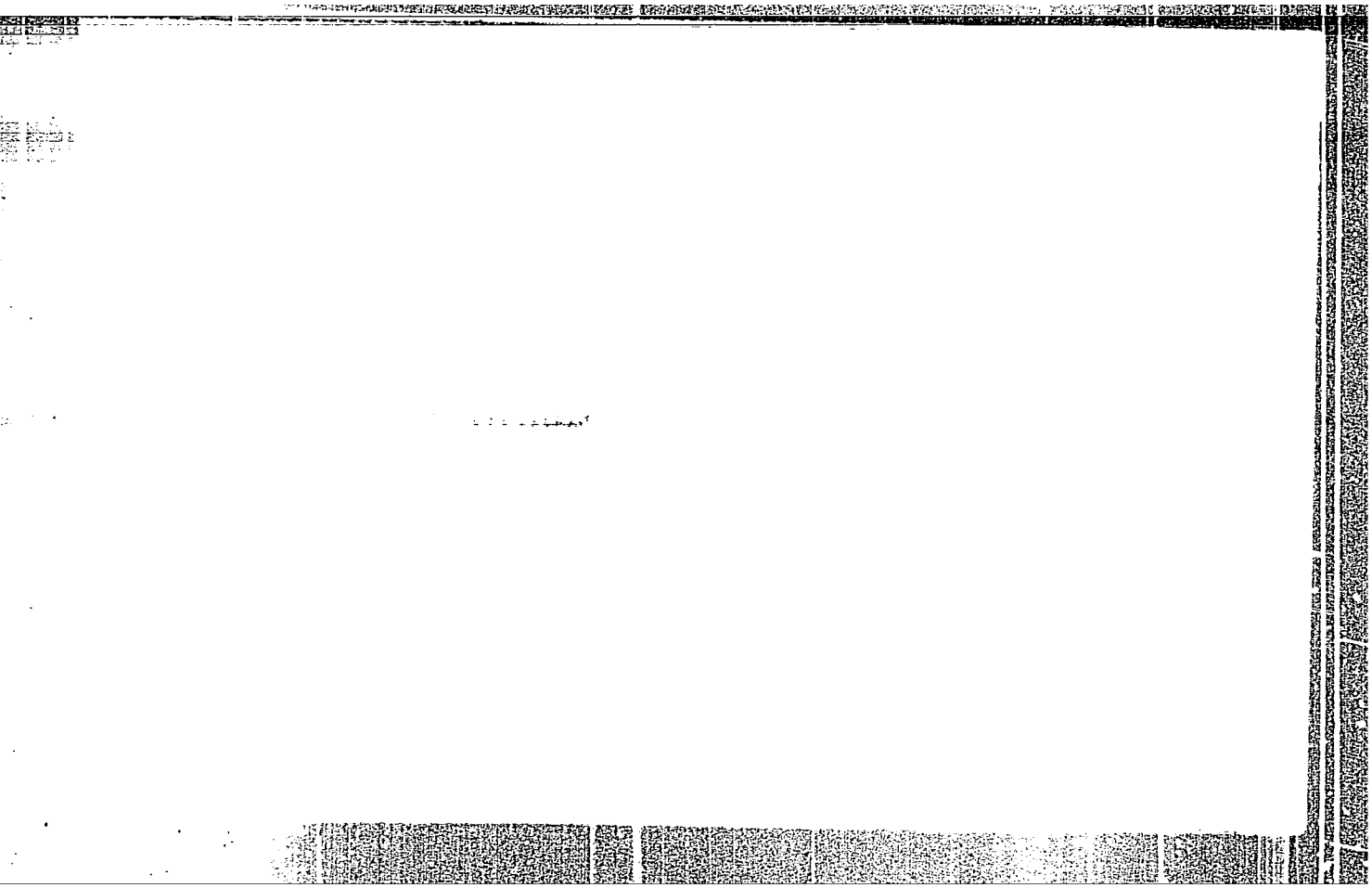

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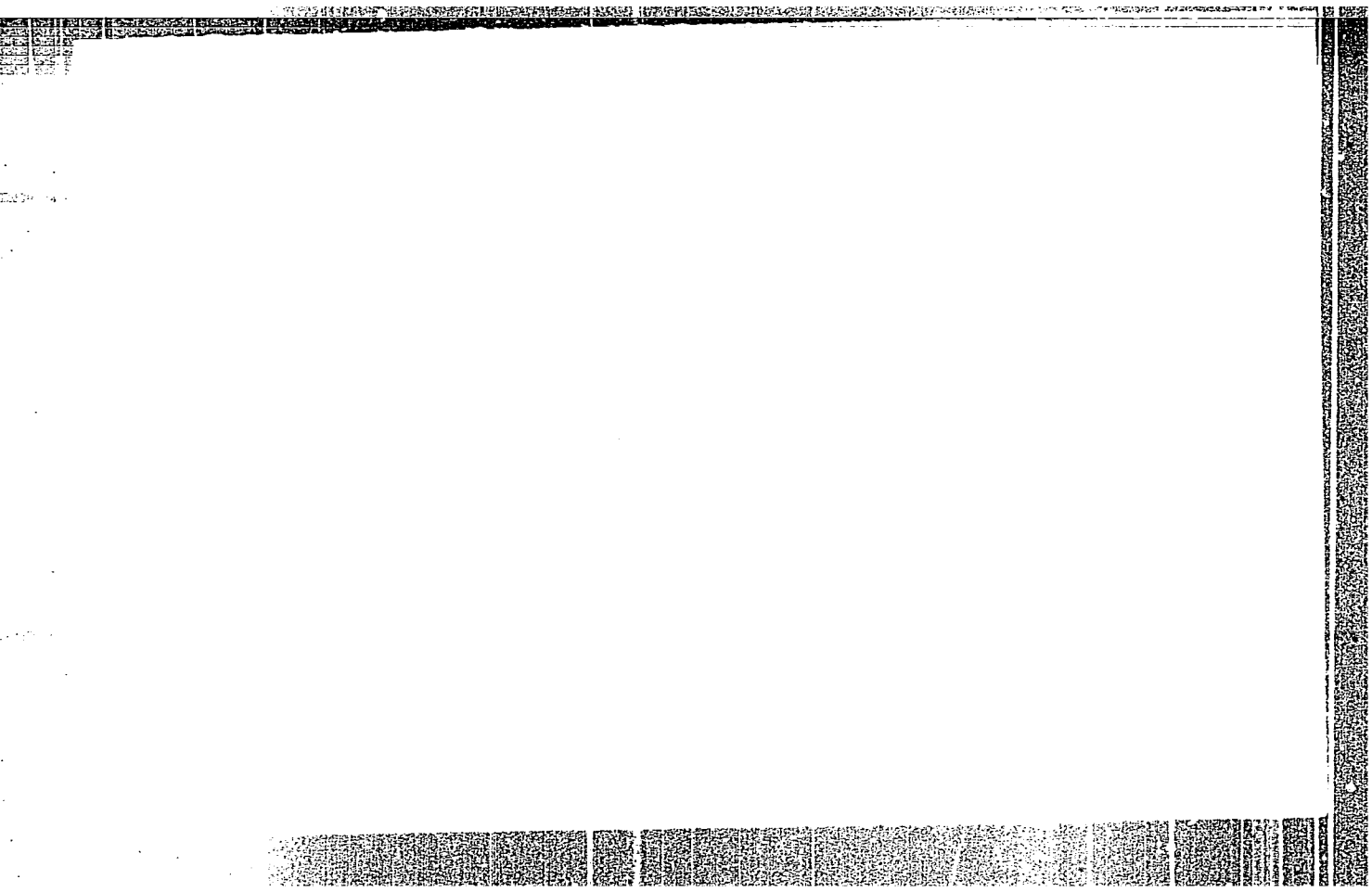

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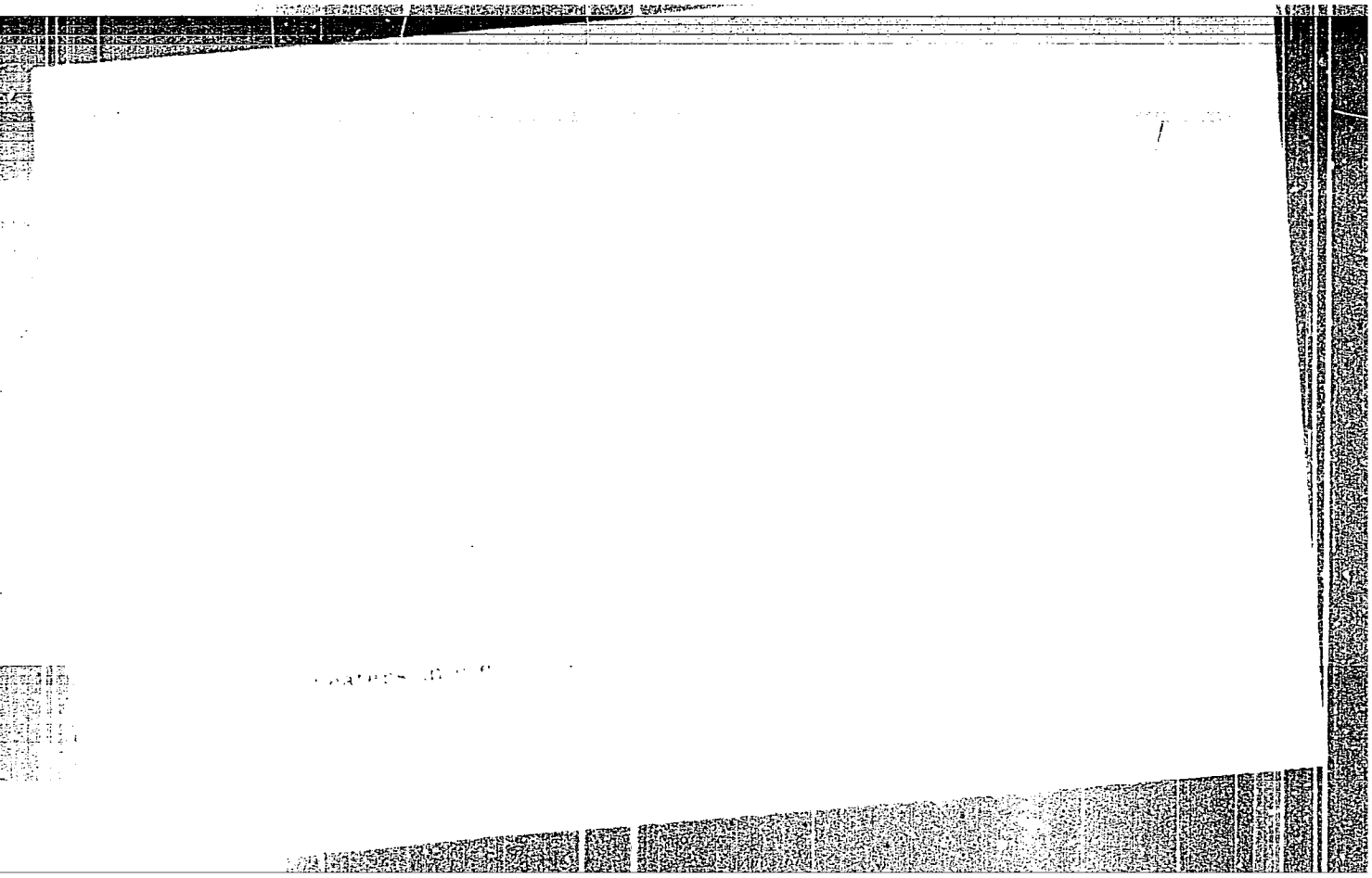

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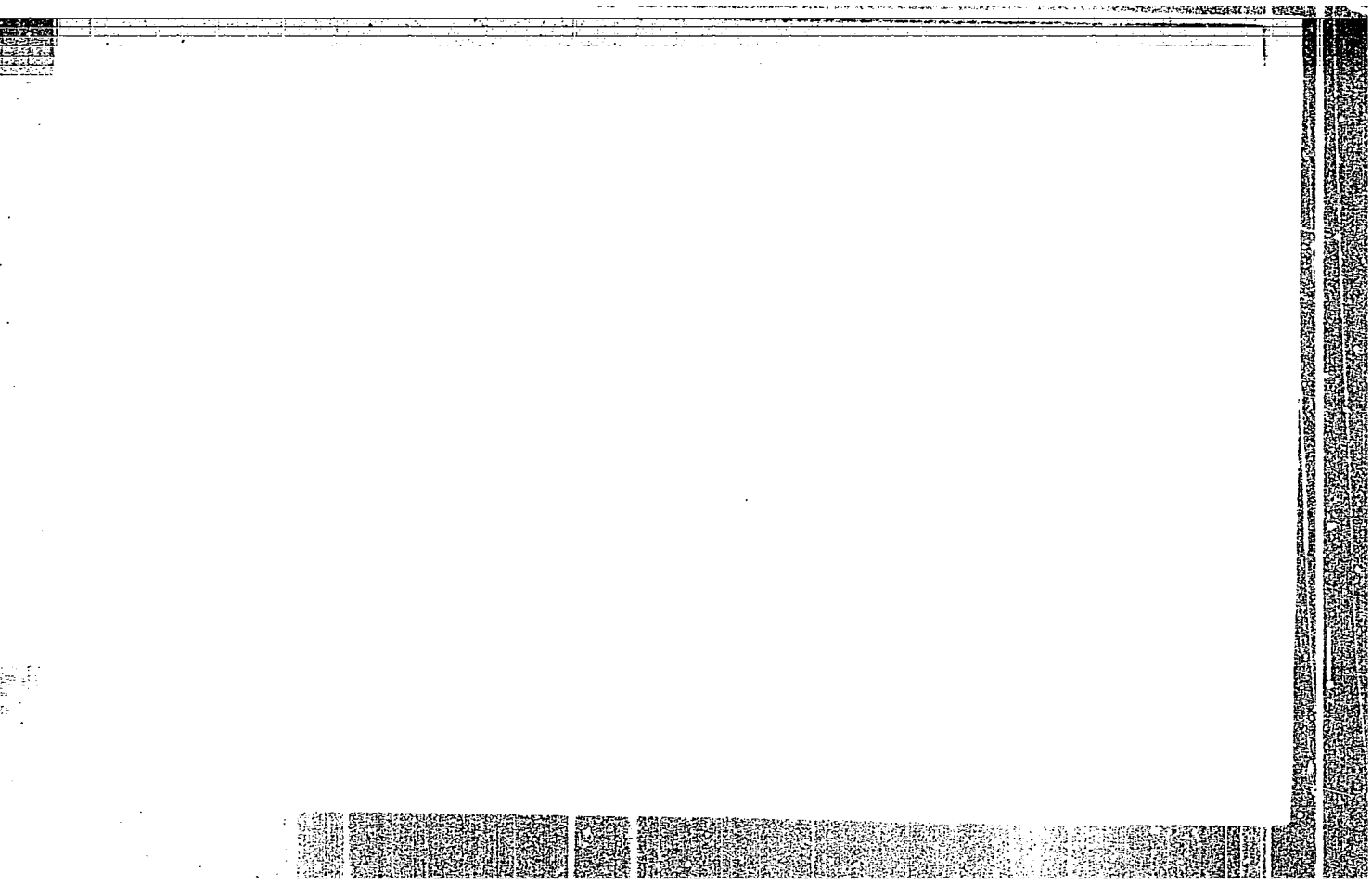
NO REF SOV: 027

SUB CODE: MT, GC



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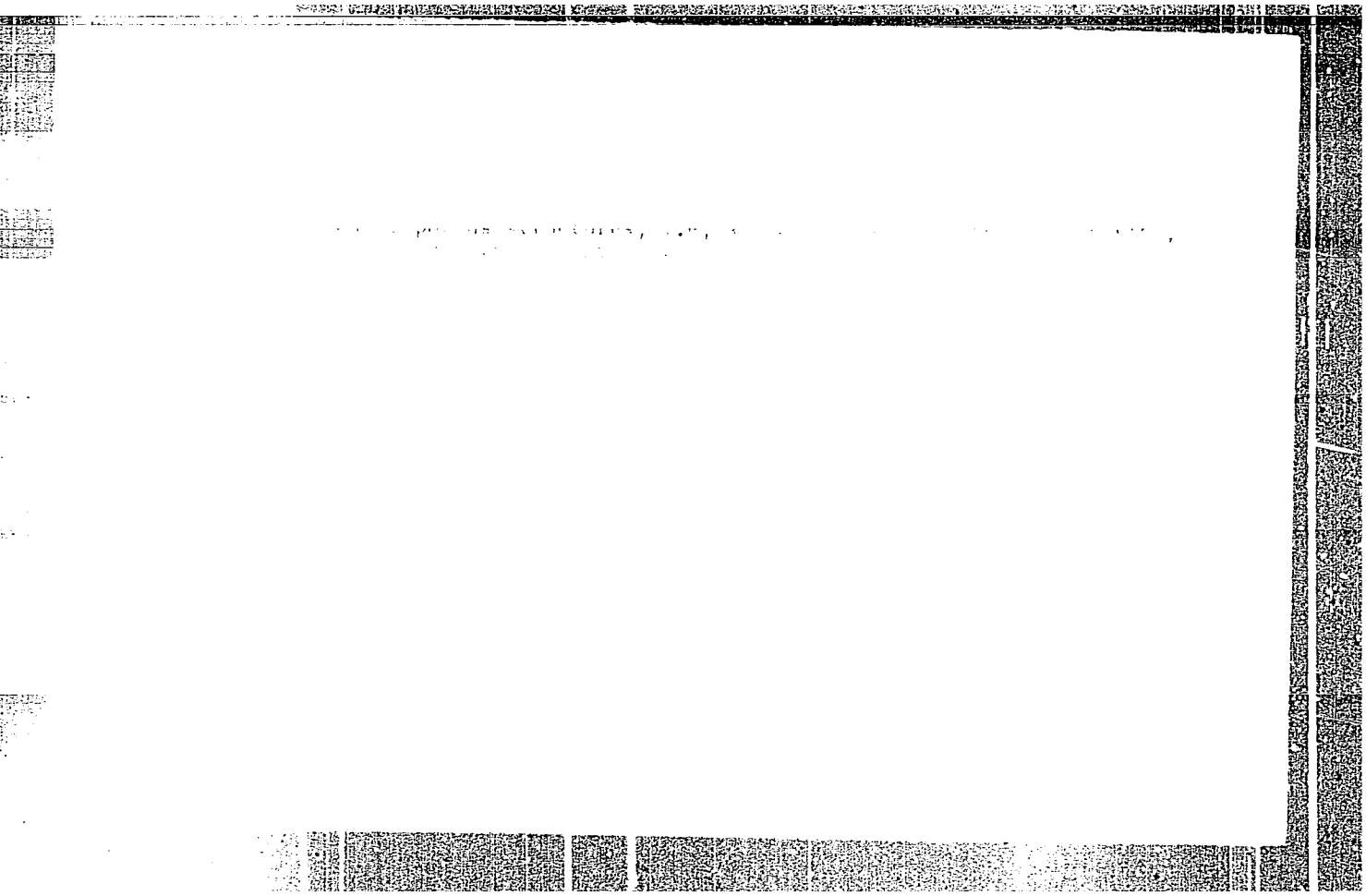

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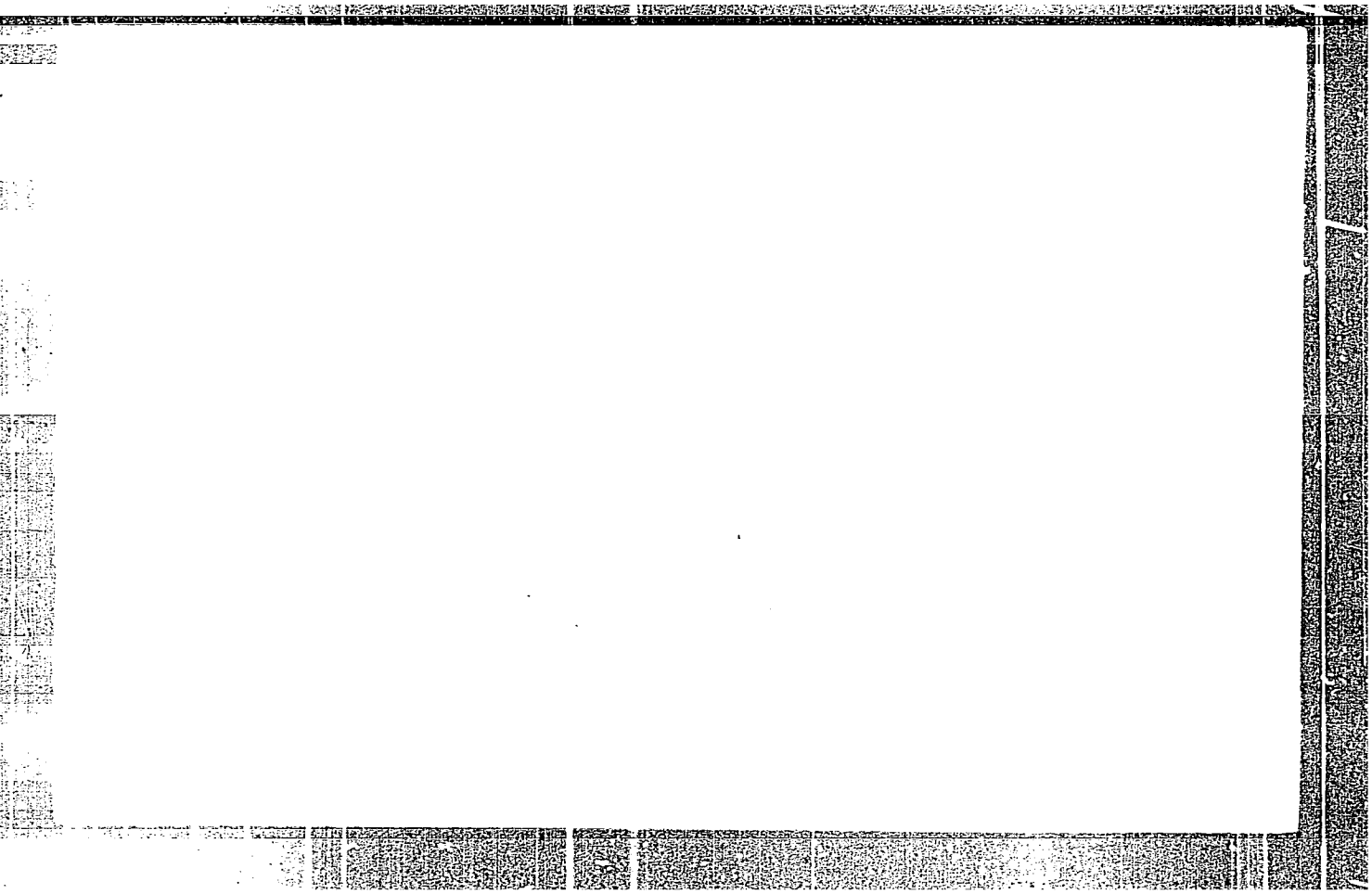

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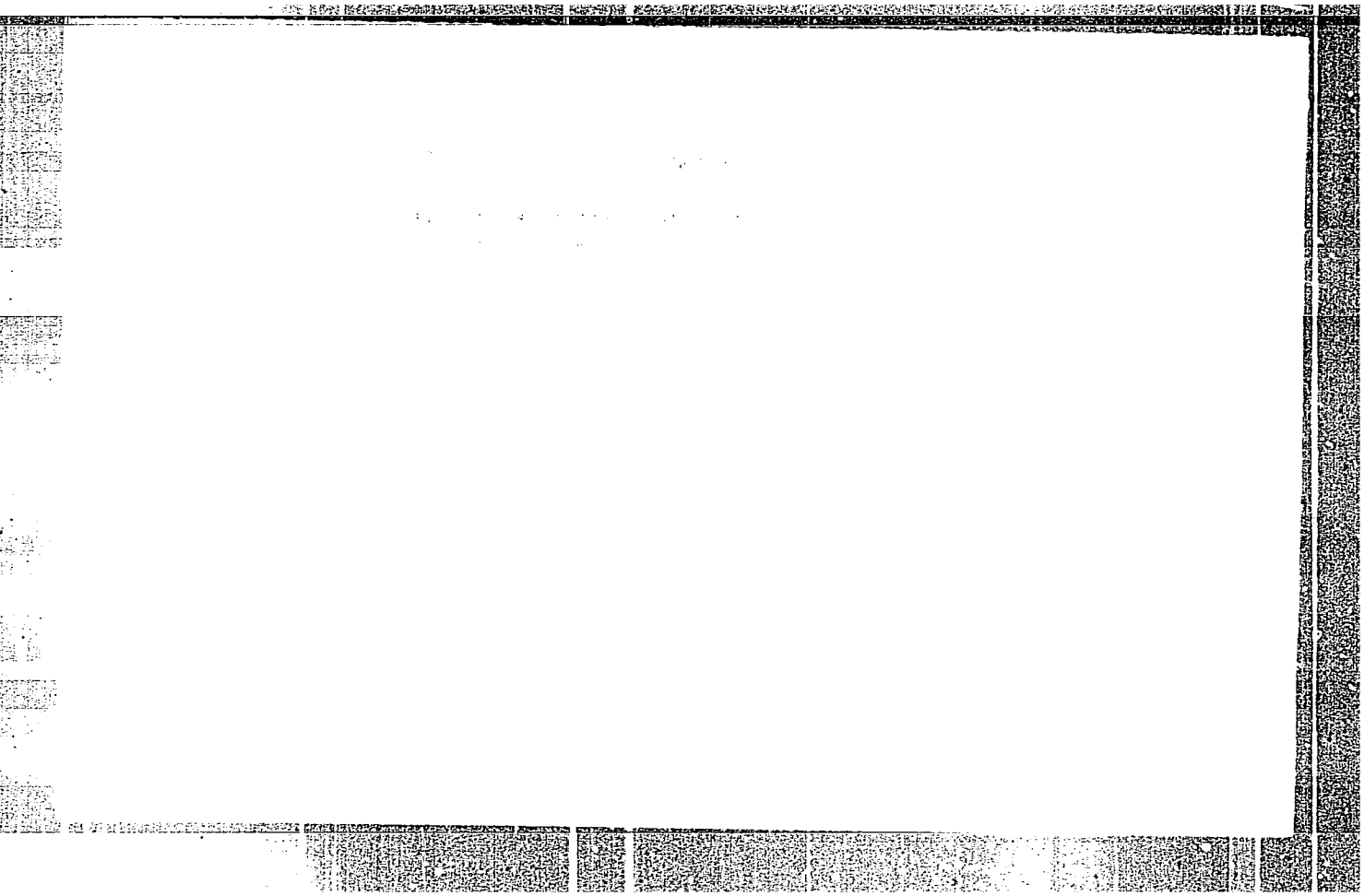

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413010010-1"

FIALKOV, A.S.; DAVIDOVICH, Ya.G.; PSHENICHKIN, P.A.; GALEYEV, G.S.; TYAN, L.S.

Effect of calcination temperature on the electron paramagnetic resonance of petroleum cokes. Zhur. fiz. khim. 39 no.4:958-961 Ap '65. (MIRA 19:1)

1. Elektrouglinskiy filial nauchno-issledovatel'skogo instituta elektromekhaniki. Submitted Feb. 27, 1964.

L 21132-66 EWT(m)/EWA(d)/EWP(j)/T/EWP(t)/ETC(m)-6 IJP(c) JD/HW/DJ/RM

ACC NR: AP6009870 (A) SOURCE CODE: UR/0413/66/000/004/0068/0068

INVENTOR: Fialkov, A. S.; Tsvelikhovskiy, G. I.; Temkin, I. V.; Baver, A. I. 42 B

ORG: none

TITLE: Preparation of antifriction material. Class 39, No. 178977

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 4, 1966, 68

TOPIC TAGS: antifriction material, lubrication, phenolformaldehyde material, wear resistant material, graphite additive

ABSTRACT: An Author Certificate was issued for a method of preparing an improved antifriction material composed of cord fabric and phenolformaldehyde resin. Wear resistance of the material is increased by heat treatment at up to 1000C and the antifriction property is enhanced by addition of graphite to the resin. [JK]

SUB CODE: 11/ SUBM DATE: 24Jul63/ ATD PRESS: 4222

Card 1/1 UDC: 621.893:678.623'32'21

L 18421-66 EWP(e)/EWT(m) WW/WH
ACC NR: AP6003488 SOURCE CODE: UR/0020/66/166/001/0077/0079

AUTHOR: Fialkov, A. S.; Davidovich, Ya. G.; Yurkovskiy, I. M.

ORG: none

TITLE: Preferential crystallization in graphitic materials

SOURCE: AN SSSR. Doklady, v. 166, no. 1, 1966, 77-79

TOPIC TAGS: graphite, graphitization, crystallization, crystal structure analysis, expansion ratio, high temperature material, thermal expansion, anisotropy

ABSTRACT: Anisotropic structural changes in graphitic materials at high temperatures were studied. The experimental material used was a mixture of coke containing 20% pitch. The coke was pressed and sintered at temperatures up to 1100°C. Samples (0.7 x 0.7 x 6 cm) were cut from the blocks both parallel and perpendicular to the direction of pressing. The linear thermal expansion characteristics of the samples were determined in the temperature range of 100 to 300°C. The resulting structural changes following heating were analyzed by x-ray diffraction using CuK_{α} radiation. The ratio of intensities of the (002) planes perpendicular and parallel

Card 1/2 UDC: 548.73

L 18421-66
ACC NR: AP6003488

to the pressing direction was called the structural anisotropy factor; this ratio tabulated for different temperatures ranging from 1300-3000°C. Thermal expansion data are given for various processing temperatures and for both the parallel and perpendicular pressing directions as a function of temperature. These curves exhibited a minimum at about 1500 to 1700°C, which coincided with the appearance of intensive x-ray dispersion from the (112) and (101) reflections. An equation is given for the displacement of the hexagonal lattice dimensions as a function of wavelength and Bragg angle for the (100) reflection. The thermal expansion curves exhibited maxima at about 1100°C as a result of texturing during treatment and subsequent reorientation of the hexagonal lattice planes during heating. This general phenomenon was described as third degree ordering. Orig. art. has: 3 figures, 1 table.

SUB CODE: 11/ SUBM DATE: 22Apr65/ ORIG REF: 002/ OTH REF: 004

Card 2/2 mc

L 44178-66 EWP(e)/EWT(m) WW/WH

ACC NR: AP6011280 (A) SOURCE CODE: UR/0413/66/000/006/0157/0157

48
B

INVENTOR: Fialkov, A. S.; Davidovich, Ya. G.; Pakhomov, L. G.

ORG: none

TITLE: Treatment of carbon-graphite products. Class 21, No. 141194

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 6, 1966, 157

TOPIC TAGS: carbon graphite product, ~~current treatment~~ carbon product, graphite, physical chemistry property, semiconductivity

ABSTRACT: This Author Certificate introduces a method for treating carbon-graphite products by passing a-c and d-c current through them. To obtain a sharply defined boundary of physical, chemical, and semiconductive properties along the length of the product, current of various magnitude is passed through various sections of the product at the same time that they are subjected to various degrees of cooling.

[LD]

SUB CODE: 11/3/ SUBM DATE: 03Jan61/

Card 1/1

ACC NR: AM5026677

Card 2/2 SUB CODE: 11/ SUBM DATE: 11Feb65/ ORIG REF: 052/ OTH REF: 064

AUTHORS: Fialkov, B.S., Engineer and Gruzinov, V.K., Doctor of Technical Sciences SOV/133-58-6-4/33

TITLE: The Influence of the Position of the Combustion Zone on the Operation of a Blast Furnace (Vliyaniye raspolozheniya zony goreniya na rabotu domennoy pechi)

PERIODICAL: Stal', 1958, Nr 6, pp 495 - 502 (USSR).

ABSTRACT: The relationship between the parameters of the combustion zone and the distribution of materials in the throat is discussed in the light of literature data (mainly Russian references are quoted) and authors' own investigations of the combustion zone of two furnaces and studies of the burden descent on the blast furnace models. During the authors' investigations at constant blowing conditions, the length of the combustion zone varied from 1 200 to 1 800 mm. This variation they think was due to the thermal state of the hearth as generally with shorter combustion zones the content of silicon in iron was higher. If the hearth becomes cooler, the heat transfer from the combustion zone increases, thus the temperature of the combustion zone decreases, the length of the combustion zone increases and the combustion process takes place in a bigger volume. This is demonstrated in Figure 1,

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where the ratio of the length of combustion zone to the distance from the tuyere nozzle to the focal point of combustion is plotted against the intensity of combustion in the focal point of the combustion zone. The latter was characterised by the concentration of CO_2 in the focal point. According to the authors, the kinetic energy of blast can influence only the initial part of the combustion zone. This influence becomes obvious only on attaining a certain level of kinetic energy, different for different furnaces. Apparently, at low kinetic energy of the blast stream, it is pierced by lumps of coke near to the tuyere nozzle and the combustion starts in the whole volume of the stream. At a higher value of the kinetic energy of the blast stream, the lumps of coke cannot pierce the stream near the tuyere nozzle and the combustion process near the tuyere nozzle takes place only on the periphery of the stream (Figures 2 and 3). The gas permeability of the burden column also has an influence on the length of the combustion zone; the latter increases with decreasing permeability. The blast temperature has little influence on the position of the focal point of the combustion zone. On the other hand, the charging

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sequence (CCOOL or OOCCL) has an influence on the position of the focal point of the combustion zone. This is explained by the influence of the velocity of the removal of combustion products which will depend on the gas permeability of the burden layer above the combustion zone. As the largest decrease in the volume of the solid phase (40-50%) in the burden column and a corresponding increase in the permeability are observed on the level of melting (in places of maximum accumulation of ore) therefore, a high gas permeability of the column is attained on the vertical of the sector of the most intensive melting of ore. The decrease in the packing density of the burden depends to a large extent on the velocity of its descent. From the work on models (Figure 4), the maximum rate of the descent of burden should take place over the focal point of the combustion zone. When the projections of the combustion zones and sectors of maximun concentration of ore are on a horizontal plane, the gas permeability of the burden over the combustion zone will be at a maximum. A comparison of diagrams of changes in the composition of gas along the tuyere axis and corresponding to them, the diagrams

of changes in the composition of gas along the throat radius indicated that there is a definite relationship between the position of the maximum CO_2 content along the throat radius and the position of the focal point of the combustion zone, namely, the two points have a tendency to coincide along a vertical line. When the position of the maximum of CO_2 content in the top gas is shifted, the focal point of the combustion zone is also shifted in the same direction. It was found that the projection of the position of maximum CO_2 along the throat radius onto a horizontal plane, passing through the tuyere axis, is situated at a definite distance from the tuyere nozzle (this was different for the two furnaces investigated). However, there are some limits within which the focal point of the combustion zone can follow the position of the maximum CO_2 content along the throat radius, that is, when the latter is near to the centre or to the wall of the throat. In these cases, the efficiency of evacuation of the combustion products ceases to be the dominating factor and the position

of the focal point of the combustion zone will be subjected to the influence of other factors. Observations of the operation of furnaces indicated that when the position of maximum CO_2 content along the throat diameter and the combustion zone do not coincide vertically, the utilisation of the gas stream deteriorates (Figure 5). The influence of the parameters of the combustion zone on furnace operation was studied on a flat glass model (scale 1:25, Figure 4). The action of combustion zones was simulated by openings on the tuyere level, through which the burden material (chrome-magnesite, 2-3 mm in size) was flowing out of the model. These formed ellipsoid zones of material with a considerably lower packing density. When the distances of the outflows from the walls were small, the ellipsoid zones were intersected by the walls (Figure 6a). On shifting the outflows towards the centre, the ellipsoid zones did not intersect with walls (Figure 6b). The phenomenon is compared with the operation of furnace Nr 1 on the Nizhne-Saldinskiy Works (working volume 330 m^3 and hearth diameter, 5 m). The furnace

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was operating peripherally despite changes of charging sequences. Only when the tuyeres were pushed deeper into the furnace and their diameter reduced did its operation improve considerably (i.e. measures were taken to shift the combustion zone towards the centre). The size of the "dead man" also depends on the position of the combustion zones; with increasing distance between two opposite combustion zones the size of the "dead man" increases. The same results are obtained by decreasing the size of the outflow. On the other hand, by increasing the size of outflow, the intersection of the ellipsoid of low packing with walls takes place earlier and a comparatively large part of these zones appears as it was outside the furnace profile. In a blast furnace, this would increase the peripheral working. Thus, a shift of tuyeres deeper into the furnace appears to be more effective in improving the distribution of the gas stream in the furnace than an increase in the size of combustion zones. The pressure of the burden materials on the horizontal plane at tuyere level with increasing height of the burden column was also investigated on the model. The results obtained agreed

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with the views on the behaviour of granular materials during their flow (Ref 19). On the basis of the results obtained the following conclusions are drawn: 1) the position of the focal point of the combustion zone of a normally operating furnace depends not only on the temperature and volume of the blast but also on the position of zones of the most intensive formation of molten masses; 2) The distribution of burden materials in the furnace throat should be related to the position of the combustion zones; 3) A rational protrusion of tuyeres helps in containing the ellipsoid zones into the furnace profile; 4) The influence of the bosh on the descent of materials is insignificant and with a correct co-ordination of the furnace profile with the ellipsoid zones - completely absent; 5) The optimum position of the maximum CO_2 content along the throat diameter in relation to the position of combustion zones should be experimentally determined for each furnace.

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The Influence of the Position of the Combustion Zone on the Operation of a Blast Furnace

There are 6 figures and 21 Soviet references including 2 English in Russian translation.

1. Blast furnaces--Performance 2. Combustion--Applications

Card 8/8

FIALKOV, B.S.; GRUZINOV, V.K.

Rate of outflow of loose materials from openings and the shape of the zone of loosening. Izv. vys. ucheb. zav.; chern. met. no.12: 17-22 '60. (MIRA 14:1)

1. Ural'skiy politekhnicheskiy institut.
(Granular materials)

FIALKOV, B.S., inzh.; GRUZINOV, V.K. doktor tekhn.nauk

Speed of extracting loose material from an opening and the shape of the zone of disintegration. Izv.vys.ucheb.zav.; gor.zhur. no.2:9-20 '61. (MIRA 14:3)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova. Rekomendovana kafedroy metallurgii chuguna Ural'skogo politekhnicheskogo ingtituta.

(Granular materials)

FIALKOV, B.S.; GRUZINOV, V.K. Prinimal uchastiye KOLBIN, G.V.

Control of the movement of charge materials above the combustion zone. Izv. vys. ucheb. zav.; chern. met. 4 no.10:19-25 '61.
(MIRA 14:11)

1. Ural'skiy politekhnicheskiy institut.
(Blast furnaces) (Oscillators, Crystal)

FIALKOV, B.S.; GRUZINOV, V.K.

Changes in the structure of a layer under the effect of its movement. Izv. vys. ucheb. zav.; chern. met. 4 no.12:18-26 '61. (MIRA 15:1)

1. Ural'skiy politekhnicheskiy institut.
(Blast furnaces--Models)