

MERKULOV, A. P.

"The Vortex Refrigerating Unit."

Report submitted for the 10th Intl. Refrigeration Congress, Copenhagen,
19 August - 2 September 1959.

MERKULOV, A. P. (Assist. Prof. Tech. Sc.)

"Method of Designing Wind Cooling Devices."

report presented at the 13th Scientific Technical Conference of the Kuybyshev
Aviation Institute, March 1959.

25(2)

SOV/29-59-1-15/26

AUTHOR:

Merkulov, A., Candidate of Technical Sciences

TITLE:

Vortex Refrigeration Chamber (Vikhrevaya kholodil'naya kamera)

PERIODICAL:

Tekhnika molodezhi, 1959, Nr 1, pp 24 - 24 (USSR)

ABSTRACT:

On account of the investigations carried out, the Kuybyshevskiy aviatsionnyy institut (Kuybyshev Aeronautical Institute) designed the diagram of a refrigeration chamber the working principle of which is shown on the drawing at the side. It contains a whirling cooler as well as a heat exchanger. At first the compressed air from the main pipe is cooled in the heat exchanger, and then enters the whirling cooler. From the whirling cooler it gets into the cooling with products or machine parts, and from here it is sucked out into the atmosphere by means of an ejector. The hot air current serves for sucking off the cold air current. Owing to the operation of the ejector, a vacuum is formed in the cold air tract which leads to an increased cooling effect. At 5 atmospheres absolute pressure a cold air current down to -60°C can be obtained in the cooling chamber. The vortex refrigeration plant is most simple, reliable, can be started

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Vortex Refrigeration Plant

SOV/29-59-1-15/26

quickly and attains the necessary working conditions in a very short time. Besides, it has a remarkable property: By the use of the hot air current, temperature in the chamber can be reduced and, on demand, increased up to over 150°C. The adjustment is done very quickly. There is 1 figure.

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SOV/66-59-5-2/35

14(1)

AUTHORS: Merkulov, A., Candidate of Technical Sciences

TITLE: Vortex Refrigeration Chamber

PERIODICAL: Kholodil'naya tekhnika, 1959, Nr 5, pp 8-12, (USSR)

ABSTRACT: The drawback of the vortex refrigerator is its low efficiency. The adiabatic efficiency factor of the best vortex refrigerator which has been tested is 0.235. Efficiency can only be raised by utilizing the energy of the outflowing cold air current in straightening it out, by regenerating cold and by ejecting the cold air by hot air blast, by cutting down the length of the vortex zone and straightening the hot air flow. These different processes are described in the article and analyzed. The theory developed by the author finds its application in the design of a vortex chamber, the KhK-3 which has been constructed and tested; it has the following characteristics: maximum pressure - 8 atmospheres, temperature of compressed air 15°C, minimum temperature in cold chamber -70°C, consumption of compressed air 2.2 cu m-minute, size of the refrigerator 0.75 x 0.9 m, weight 35 kg. The article contains a description of the design, features and operation of the

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SOV/66-59-5-2/35

Vortex Refrigeration Chamber

refrigerator, which is intended for use in laboratories, also for thermic treatment of metal parts and instruments.
There are: 1 photo, 1 diagram, 1 graph and 7 Soviet references.

• ASSOCIATION: Kuybyshevskiy aviatsionnyy institut (Kuybyshev Aviation Institute)

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2*028

S/081/61/000/011/063/139

B117/B101

1961-12

AUTHOR: Merkulov, A. P.

TITLE: Method of calculating a vortex cooling system

PERIODICALS: Referativnyy zhurnal. Khimiya. no. 15, 1961, 293, abstract
 "VSI (Sb. "Dostizh. i zadachi v proiz-ve i primeneni
 kachestv v narodn. kh-ve SSSR". M., 1960, 117 - 123)

NOTE: In order to achieve maximum efficiency of a vortex cooling system it is suggested to use a heat exchanger for regenerating the cold of the reflux, a hot-gas ejector to increase the pressure difference, and a diffuser to slow down the cold flow. The apparatus may be operated not only by compressed air but also by a vacuum pump connected to the outlet of the ejector. In this case the apparatus may serve as altitude chamber. An approximate method of calculating the apparatus is suggested.
 [Author's note: Complete translation.] X

0995
S/066/60/000/006/004/009
A053/A029

26.2190

AUTHOR: Merkulov, A., Candidate of Technical Sciences

TITLE: Vortex Thermostat

PERIODICAL: Kholodil'naya tekhnika, 1960, No. 6, pp. 16-18

TEXT: In order to determine the thermo-physical properties of objects, a thermostat operating on positive and negative temperatures is indispensable. Such a thermostat has been developed by the author and tested in the Experimental and Designing Bureau for Vortex Apparatus of the Kuybyshevskiy aviatsionnyy institut (Kuybyshev Aviation Institute). The work of the thermostat is based on the vortex effect of the energy division of gases. In order to obtain negative temperatures in the thermostatic chamber, the cold flow in the vortex pipe is used, and for positive temperatures the hot flow. The thermostat is equipped, besides the vortex pipe, with a heat exchanger and an ejector, in the same way as in the vortex refrigerating chamber. The article describes how negative temperatures are obtained by directing the compressed air flow in such a way that it is chilled prior to entering the vortex pipe. It leaves the vortex pipe through the opening of the

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89955

S/066/60/000/006/004/009
A053/A029

Vortex Thermostat

diaphragm, traverses faucet (8) and after cooling the thermostatic chamber (6) passes through faucet (2) and is drawn off by the ejector (1) which operates on the hot air flow of the vortex pipe. In order to obtain positive temperatures, faucets (2), (3) and (8) are turned so that the hot air flow passing through faucet (3) is directed toward the space surrounding thermostatic chamber (6) which it heats. Continuing through the heat exchanger (7), the hot air flow heats the compressed air, after which it leaves through faucet (2) and passes through the adjustable jet of the ejector, while maintaining its pressure, which is required in the ejector to obtain the necessary ejection rate from the jet. The temperature in the thermostatic chamber is measured by thermocouples with a millivoltmeter indicator having a temperature scale. By changing the diaphragm of the vortex pipe, the range of temperatures can be shifted toward either positive or negative temperatures. The selection of the diaphragm, larger or smaller, should be made at the time of assembly. At stable pressures and even temperatures of dried compressed air, the chosen temperature in the thermostatic chamber can be maintained indefinitely within the limits of $\pm 0.5^{\circ}\text{C}$. The following technical characteristics of the vortex thermostat BT : (VT-1), operating on

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S/066/60/000/000/004/009
A053/A029

Vortex Thermostat

dried compressed air are given: maximum air pressure 5 atmospheres, temperature 20°C; lowest temperature of cold air flow -57°C; highest temperature of hot air flow 140°C; volume of thermostatic chamber 40 l; maximum refrigerating capacity 900 kcal/hour. The thermostat can also operate on air which has not been dried, in which case, however, there will be a loss of temperature of 10 - 15 %. Being very simple in design and reliable in operation, the vortex thermostat requires no qualified attendance. There is 1 diagram, 1 photograph, 1 graph and 1 Soviet reference.

ASSOCIATION: Kuybyshevskiy aviatsionnyy institut (Kuybyshev Aviation Institute). ✓

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89955

s/066/60/000/006/004/009
A053/A029

Vortex Thermostat

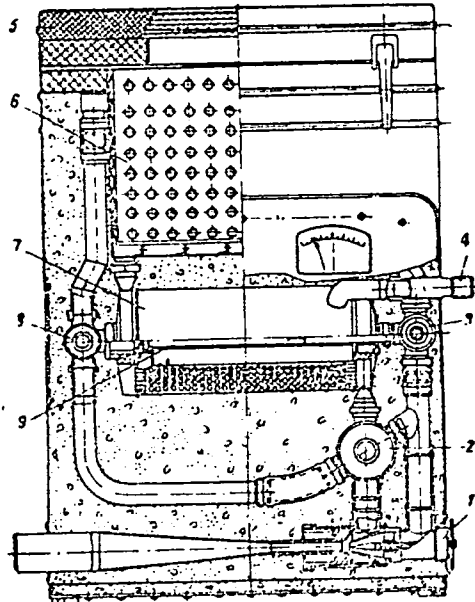


Figure 1:

Arrangement of vortex thermostat

- 1) ejector, 2), 3), 8) faucets
- 4) connecting pipe,
- 5) cover, 6) thermostatic chamber, 7) heat exchanger,
- 9) vortex pipe

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3/124/62/000/008/013/030
I006/I242

AUTHORS: Merkulov, A.P. and Kolyshev, N.D.
TITLE: The advisability of using the vortex effect at high pressures
PERIODICAL: Referativnyy zhurnal, Mekhanika, no.8, 1962, 42, abstract
8B271. (Tr. Kuybyshevsk. aviats. in-t, no.12, 1961, 275-282)

TEXT: An experimental investigation is conducted in a vortex tube 5 mm in diameter at pressures up to 50at. In the process of optimum cooling it is shown by extrapolation that a pressure of 100 at represents the limit of sensible application, since the vortex tube effect and the Joule-Thomson effect coincide. The analysis shows the inadvisability of regenerative systems at high pressures. In order to attain low temperatures at a high degree of rarefaction, the use of multi-stage systems with uniform distribution of rarefaction between stages is recommended.

[Abstracter's note: complete translation]

Card 1/1

S/263/62:000-009-005 010
1007:1207

AUTHORS Merkulov, A. P. and Kolyshev, N. D.

TITLE Whirl-type hygrometer

PERIODICAL Referativnyy zhurnal, otdel'nyy vypusk. 32. Izmeritel'naya tekhnika, no. 9, 1962, 38
abstract 32 9 242 (Tr. Kuybyshevsk aviats. in -t), no. 12, 1961, 283-289

TEXT Description is given of working principle and design of a whirl-type hygrometer with cold-flow removal, designed at the Kuybyshev Aviation Institute (KuAI). The working principle is based on the condensation method of dew-point determination. According to preliminary tests the hygrometer works in a temperature range up to -20°C at an input pressure of 6 atm and an input temperature of 20°C . The temperature of the sensing element can be controlled with an accuracy of about 0.5°C , by regulating the input pressure. Relative humidity is measured in a range from 4 to 100%. The time until the device reaches the given temperature is less than 1 min. The hygrometer described is for air and gas humidity measurement and control in textile-conditioning shops, in laboratories, drying and chemical industries, etc.

[Abstracter's note: Complete translation.]

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MERKULOV, Aleksandr Petrovich, kand. tekhn. nauk; IVANOV, S.M., red.;
RAKITIN, I.T., tekhn. red.

[Tamed tornado]Ukroshchennyi smerch. Moskva, Izd-vo "Znanie,"
1963. 30 p. (Novoe v zhizni, nauke, tekhnike. IV Seria: Tekhnika,
no.3) (MIRA 16:2)

(Vortex tube)

L 39742-65 EWT(d)/EWf(m)/EPT(e)/EWA(d)/EWP(r)/EPR/EWP(t)/EWP(k)/EWP(h)/
 EWP(b)/EWP(l) Pf-4/Pr-4/Pe-4 IJP(e) JD 33
 ACCESSION NR: AR5006717 S/0282/65/000/001/0033/0033 B

SOURCE: Ref. zh. Khimicheskoye i kholodil'noye mashinostroyeniye. Otd. vyp.,
 Abs. 1.47.175

AUTHOR: Merkulov, A. P.; Gusev, I. I.

TITLE: Industrial low-temperature cooling equipment, 14

CITED SOURCE: Tr. Konferentsii po perspektivam razbitiya i vnedreniya kholodil'n.
 tekhn. v nar. kh-vo SSSR, 1962. M. Gostorgizdat. 1963, 241-245.

TOPIC TAGS: industrial refrigeration, nitrogen chamber, choke coil cooler

TRANSLATION: The article describes briefly and presents the technical specifica-
 tions of a nitrogen cooling chamber and a choke coil cooler. Temperatures of 0 to
 -160C can be attained in the former, while the latter is capable of cooling air
 down to -160C. Four illustrations.

SUB CODE: IE

ENCL: 00

Card 1/1

MERKULOV, A.P., kand.tekhn.nauk

Low-temperature AKhK-1 and DKhK-1 refrigerating units. Khol.tekh. 40
no.1:77-78 Ja-F '63. (MIRA 16:3)

(Refrigerators)

MERKULOV, Aleksandr Petrovich

[Labor and automation] Trud i avtomatika. Moskva, Prof-
izdat, 1963. 129 p. (MIRA 16:11)
(Automation) (Labor and laboring classes)

L-11968-66 EWT(l)/EWP(m)/EET(m)/EWA(d)/ECS(k)/EWA(1) ID
 ACC-NR- AT6003088 SOURCE CODE: UR/3181/63/000/015/0205/0214

AUTHORS: Merkulov, A. P.; Kolyshov, N. D.

13
B+1

ORG: Joint Scientific-Technical Conference on Problems of the Mechanics of Liquid and Gas (Kustovaya nauchno-tehnicheskaya konferentsiya po voprosam mekhaniki zhidkosti i gaza)

TITLE: Experimental verification of the interacting vortex hypothesis

SOURCE: Kuybyshev. Aviatsionnyy institut. Trudy, no. 15, pt. 2, 1963. Doklady kustovoy nauchno-tehnicheskoy konferentsii po voprosam mekhaniki zhidkosti i gaza (Reports of the Joint scientific-technical conference on problems of the mechanics of liquid and gas), 205-214

TOPIC TAGS: vortex flow, compressible flow, heat transfer, experimental method, pressure distribution, supersonic flow

ABSTRACT: As a direct extension to the senior author's previous work (Kuybyshev aviatsionnyy institut, Trudy. No. 15. pt.2, 1963), an experimental verification was made of the theory on interacting vortices. The analysis indicates that the pressure distributions in the free and induced vortices are given respectively by

$$P = P_1 \left[1 - \frac{\kappa-1}{1} M_1^2 \left(\frac{1}{r^2} - 1 \right)^{\frac{\kappa}{\kappa-1}} \right]$$

$$P = P_0 \left[1 + \frac{\kappa-1}{2} M_1^2 \cdot \pi_1^{\frac{\kappa-1}{\kappa}} \cdot \frac{r^2}{r_0^2} \right]^{\frac{\kappa}{\kappa-1}}$$

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L 11968-66

ACC NR: AT6003088

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whereas the temperature distribution in the induced flow yields

$$T_a = T_1 \left[\frac{1}{\kappa_1} + \frac{\kappa_1 - 1}{2} M_1^2 r^2 \right]$$

$$T_1 = T^* \frac{1}{\left(1 + \frac{\kappa_1 - 1}{2} M_1^2\right)}$$

The apparatus consists of an exit nozzle (tangential), a vortex tube, a vortex generator, and probes such as static pressure ports and thermocouples to measure the total temperature. As predicted analytically, the experiments show the presence of two vortices in the nozzle section such that under critical conditions the peripheral free vortex becomes supersonic and the measured value of the minimum pressure ratio $\pi^* = 4.15$ is very close to the calculated value. Similarly, the temperature drop near the vortex center is found to agree well with the analytic prediction. The authors contend that this technique can be used to generate high vacuum refrigeration units without the need of ejectors or heat exchangers. Orig. art. has: 5 figures, 7 formulas, and 1 table.

SUB CODE: 20/

SUBM DATE: none/

ORIG REF: 001

Card 2/2 jmt

L 14969-66 EWT(1)/EWP(m)/EWT(w)/EWA(d)/ECS(k)/EWA(1) JD
ACC NR: AT6003087 SOURCE CODE: UR/3181/63/000/015/0197/0203

AUTHOR: Merkulov, A. P.

54
BT

ORG: Joint Scientific-Technical Conference on Problems of the Mechanics of Liquid and Gas (Kustovaya nauchno-tekhnicheskaya konferentsiya po voprosam mekhaniki zhidkosti i gaza)

TITLE: Hypothesis of vortex interaction

SOURCE: Kuybyshev. Aviatsionnyy institut. Trudy, no. 15, pt. 2, 1963. Doklady kustovoy nauchno-tekhnicheskoy konferentsii po voprosam mekhaniki zhidkosti i gaza (Reports of the Joint scientific-technical conference on problems of the mechanics of liquid and gas), 197-203

TOPIC TAGS: vortex flow, pressure distribution, compressible flow, isentropic flow, Mach number

ABSTRACT: The behavior of direct current and countercurrent ^{1,55}vortex flows is investigated analytically. In the direct flow case the tangential nozzle is assumed to have a small axial velocity u relative to the tangential velocity V . The isentropic potential vortex distribution is assumed to be given by the equation $v \cdot r = \text{const}$. It is shown that under these conditions there exist two isentropic vortices, one a free peripheral vortex and the other an induced central vortex such that the radius of the inner vortex relative to the outer vortex can be given by

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L 11969-66

ACC NR: AT6003087

$$\bar{r}_s^2 = \frac{(\kappa-1)M_1^2}{1 - \left(\frac{1}{\pi_1}\right)^{\frac{\kappa-1}{\kappa}} + \frac{\kappa-1}{2}M_1^2}$$

where $\pi_1 = P_1/P_0$ (P_1 and P_0 are the static pressures on the periphery and the axis respectively). The minimum value of r_2 is given by

$$(r_2)_{\min} = \left(\frac{\kappa-1}{\kappa+1}\right)^{\frac{1}{2}}$$

In the countercurrent case the nozzle-end of the tube is partially closed with a central circular hole, and the axial velocity distribution is given by

$$u^s = \frac{2\kappa}{\kappa-1} gRT_1(a + br^2 - c)$$

The mass flow rate is calculated from

$$G = F_c \frac{P^*}{\sqrt{T^*}} \left(\frac{g}{R}\right)^{\frac{1}{2}} \frac{M_1}{\left(1 + \frac{\kappa-1}{2}M_1^2\right)^{\frac{\kappa+1}{2}}}$$

which in turn can be used to estimate the mass fraction of cold core flow in the two-vortex countercurrent flow. Orig. art. has: 21 equations and 4 figures.

SUB CODE: 20/

SUBM DATE: none/

ORIG REF: 005/

OTH REF: 003

Card 2/2 *vmb*

ACCESSION NR: AP4029011

S/0143/64/000/003/0074/0082

AUTHOR: Merkulov, A. P. (Candidate of technical sciences)

TITLE: Hypothesis of vortex interaction

SOURCE: IVUZ. Energetika, no. 3, 1964, 74-82

TOPIC TAGS: vortex, vortex interaction, vortex tube, counterflow vortex tube, straight through vortex tube, vortex interaction hypothesis, turbulent flow, turbulent flow theory

ABSTRACT: A new hypothesis of the interaction between vortices is advanced which "does not contradict the previous hypotheses but makes it possible to analyze the most efficient scheme for a counterflow vortex tube and a vortex vacuum pump." The essence of the new hypothesis is that the static pressure on the periphery of a free vortex is always higher than that of a forced vortex; hence, the peripheral layers acquire a speed in the direction of the hot end of the vortex tube (the throttle). At a certain radius, the static pressure comes to a balance; the axial velocity of this layer is zero. At smaller radii, a

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ACCESSION NR: AP4029011

reverse static-pressure gradient is formed; it increases considerably toward the axis, creating axial velocities toward the diaphragm. The diaphragm-bound axial layers are accelerated by the increasingly strong peripheral vortex and form a core obeying the law of rotation of a solid body. The core flow is essentially turbulent. Its turbulence makes the core isoentropic. Thus, at the nozzle cross-section, there are two isoentropic vortices, the peripheral free one and the central forced one. This pattern can be observed in both ...the counterflow and the straight-through schemes. Formulas describing the above hypothesis are developed. It is claimed that some experimental data are in good agreement with the above hypothesis. Orig. art. has: 2 figures and 32 formulas.

ASSOCIATION: Kuyby*shevskiy aviatsionny*y institut (Kuyby*shev Aviation Institute) 5

SUBMITTED: 03Apr63

DATE ACQ: 30Apr64

ENCL: 00

SUB CODE: AP

NO REF SOV: 006

OTHER: 004

Card 2/2

MERKULOV, A.P., kand.tekhn.nauk

Apparatus for freezing and long-term storage of biological products.
Khol.tekh. 42 no.2:43-45 Mr-Ap '65. (MIRA 18:5)

1. Kuybyshevskiy aviatsionnyy institut.

L 46884-66 EWT(1)/EWT(m)/EWT(m) JD/aw

ACC NR: AR6028066

SOURCE CODE: UR/0285/66/000/005/0022/0022

AUTHOR: Merkulov, A. P.; Kolyshev, N. D.

25
B

TITLE: Velocity distribution over the height of the nozzle of a vortex tube

SOURCE: Ref. zh. Turbostroyeniye, Abs. 5. 49. 106

REF SOURCE: Tr. Kuybyshevsk. aviats. in-t, vyp. 22, 1965, 178-184

TOPIC TAGS: vortex tube, velocity profile

ABSTRACT: Results are given of an investigation of velocity profiles over the height of a nozzle at the intake of the vortex tube at various ratios of total pressures in front of the nozzle and on the axis of the vortex. The experimental unit is described and the procedure presented. [Translation of abstract] [AM]

SUB CODE: 21/

Card

1/1 *pla*

UDC: 621-515.001.5

KOZIN, A.M., MELNIKOV, A.G.

Lipoxygenase activity in γ -irradiated seeds. *Radiobiologiya* 6
no.4:571-575 1965. (MIRA 1965)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.

MERKULOV, A.V.

Consolidated hydrochemical cross section of the Mukhanovo
field. Izv.vys.ucheb.zav.; neft' i gaz 1 no.11:9-14 '58.
(MIRA 12:5)

1. Groznenskiy neftyanoy institut.
(Mukhanovo region--Oil field brines--Analysis)

MERKULOV, A.V.

Some features of the hydrogeology of the Romashkino-Minnibayevo and
Mukhanovo deposits. Trudy GNI no.21:168-172 '59. (MIRA 14:5)
(Volga-Ural region—Oil field brines)

MERKULOV, A.V.; KOTSAREV, I.Yu.

Hydrochemical sections of the Karabulak-Achaluki and Zamankul
oil fields. Geol.nefti i gaza 6 no.8:31-36 Ag '62.

(MIRA 15:9)

1. Groznenskiy nauchno-issledovatel'skiy neftyanoy institut.
(Chechen-Ingush A.S.S.R.—Water, Underground—Composition)

VASIL'YEV, V.M.; MERKULOV, A.V.

New data on the tectonics of the Karabulak-Achaluki field.
Neftegaz. geol. i geofiz. no. 7:19-21 '63. [MIRA 17:10]

1. Groznenskiy neftyanoy nauchno-issledovatel'skiy institut.

MERRILL, A. I.

"Note concerning the article by N. Barabesheva: 'Distribution of brightness in the terrestrial umbra during the total lunar eclipse of 7-8 Nov 1938,' *Astron. Jour.*, 17, no 4, 1942. (submitted 17 Jan 1942.) Testment

~~REF~~ Report U-1518, 23 Oct 1951

88009

178-1147

3.1210

Translation from: Referativnyi Zhurnal, 1977, No. 11, p. 1781-1784
(USSR)

AUTHOR: Merkulov, A.I.

TITLE: A Static Spectroellipsoid

PERIODICAL: Izv. Gl. nauch. tsentra Akad. Nauk SSSR, Ser. Fiz.-mat. Nauki
(Engl. res.)

ABSTRACT:

A new geometric drawing is proposed for the representation of the kinematic and static properties of a body. The defects are indicated at existing types of Taylor diagrams, stereographic projections and spectroellipsoids, and the kinematic and static properties are indicated by the polarizational factors of the system. The new method of representation is a static spectroellipsoid which is a geometric representation of the main difference between the two systems. The kinematic and static properties consist in a new representation of the kinematic and static properties of a dispersing unit. The kinematic and static properties of a dispersing unit are built up, to the side of the kinematic and static properties of a dispersing unit is located. The kinematic and static properties of a dispersing unit are built up, to the side of the kinematic and static properties of a dispersing unit is located. The kinematic and static properties of a dispersing unit are built up, to the side of the kinematic and static properties of a dispersing unit is located.

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A. A. M. Spectroscopy, Part 1

where D_0 is the radius of the lens, D_1 - diameter of the lens, D_2 - diameter of the disk, D_3 - diameter of the output disk, D_4 - diameter of the second diagram for a start with $D_4 = D_0$. It can be seen through the diagram that graphically, calculations were made of the necessary dimensions of image with angular dispersion of the lens. The telescope was presumed to be the lens. The factor by the interferometer is the magnitude of angular dispersion of the smoothly the air space between the plates influenced by air space between the plates. Monochromatic images in a range of wavelengths to reduce this effect to a minimum, it is the common focal plane of the lens and the of the interferometer with respect to the

Card 2/4

68560

A Static Spectroeliograph, Part I.

10/25/59-11-9011

the blurring of the image due to the cone-wise reflection of the primary image, given by the lens O_1 , from two parallel mirrors of the interferometer could be disregarded. To suppress the maxima of other waves superimposed on the slit, an extra monochromator is needed. The slit width of the interferometer and monochromator gives a "Kaleidovanny" spectrum, that is, only a series of interferometer pass bands are left of the spectrum with centers in those values of λ which correspond to the condition of forming the maximum. In the case of a wide input slit the channels are superimposed. This imposes a restriction on the dispersion of the auxiliary monochromator. It cannot be less than a certain minimum value which proves to be inversely proportional to semi-width of the pass band. It follows that the narrowing of the pass band is limited by the capabilities of the auxiliary monochromator. In the description of the experimental model of a static spectroeliograph, the regulation of the air space in the interferometer is carried out mechanically. The smooth change of its width in the limits of $\pm \lambda/2$ is accomplished by a micrometric screw, acting on the spring parallelogram, one side of which is connected to the rim of one of the plates of the interferometer. The system functions without free motion, and without upsetting the parallelism of the plates. Comparison between the aperture ratios of the kinematic and static spectroeliographs is made. The aperture ratio of the first is very small, as it is determined by relation of the width of the input slit to the full

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68369

A Static Spectrohellograph, part 1

SI/10-11-1-10

length of the aperture of the slit. The aperture ratio of the spectrohellograph is determined by the ratio of the width of the aperture of the spectrohellograph instruments, operating with optical filters or narrow filters. The experimental model of the experimental model is tested and hundreds of times repeated. The existing models of kinematic spectrohellographs, with a slit, a lens and a camera, with an aperture ratio of the instruments developed with filters. The spectrohellograph can easily be used for photography, or adapted for stereo cameras, and with slight alterations may be used as a speed recorder.

10/11/10

Card 4/4

23705

S/035/61/000/004/036/058
A001/A101

3,1540

AUTHOR: Merkulov, A.V.

TITLE: Observations with a statical spectroheliograph in 1959

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 4, 1961, 89, abstract 4A459 ("Solnechnyye dannyye", 1959, no. 8, 94 - 95)

TEXT: The author describes the continuation of works on improvement of a statical spectroheliograph (RZhAstr, 1959, no. 11, 9015) and observations performed with it. Due to replacement of the objective by one with a longer focus, diameter of the Sun's image became equal to 133 mm. Slit dimensions are 100 x 115 mm. The air gap of the interferometer is 0.17 mm which corresponds to the pass band width 0.3 A for line $H\alpha$. Observations were conducted in the III order of the grating, exposure was 0.05 - 0.1 sec for the disk and 0.5 - 2 sec for prominences. For line D_3 the pass band was 0.4 A, and exposure time 1 - 2 sec. Spectrograms in line $H\alpha$ of a filament, flare, sunspots with facula fields, and a prominence, are presented. It is pointed out that observations are possible in the region of wavelengths shorter than λ 5600 at changing the covering of the interferometer, At the existing

Card 1/2

23705

Observations with a statical spectroheliograph in 1959

S/035/61/000/004/036/058
A001/A101

system of fine extension of the interferometer, the accuracy in measurements of radial velocities amounts to 15 - 20 km/sec, which can be raised several times by some improvements. Short exposure duration makes it possible to record cinematographically chromospheric objects.

Ye. Makarova

[Abstracter's note: Complete translation]

Card 2/2

MERKULOV, A.V.

Static spectroheliograph. Part 2. Telescopic interferometric
monochromator. *Izv.GAO* 21 no.4:17-34 '60. (MIRA 14:1)
(Monochromators)

MERKULOV, A.V. -

Some new modifications of the Fabry-Perot interferometer and
their astrophysical applications. Parts 1 and 2. Izv.GAO 21
no.4:35-72 '60. (MIRA 14:1)
(Interferometer)

MERKULOV, A.V.

Time of the evolution of the Upper Cretaceous oil and gas pools.
Geol. nefti i gaza 8 no.12:61-63 D '62. (MIRA 12:2)

1. Groznenskiy neftyanoy nauchno-issledovatel'skiy institut.

MERKULOV, A. G.

Criteria for evaluating oil and gas accumulations in fractured reservoirs as revealed by the study of mesozoic sediments in the Chechen-Ingush A.S.S.R. *Izvestiya, geol. i razved.* no. 3:15-16, 1968. (17A 12:1)

1. Gosnaukiy neftyanykh i gazovoykh mestozhizheniy Institut.

MERKULOV, A. Ya.; YAKOVLEV, A. I.

Ten years of the Yalta Scientific Society of Roentgenologists.
Vest. rent. i rad. 36 no.4:86 JI-Ag '61. (MIRA 15:2)
(YALTA...RADIOLOGISTS)

MERKULOV, B. A.

Podobedor, B. S., Docent

Chronicle (Khronika) I

Investitsiya vyzhivaniya uchebnykh spetsialisty, Geodesiya i aerofotofotografy, 1958, Nr 2, pp 107-109 (USSR)

More than 500 specialists participated in the scientific and technical conference on geodesy, aerophotography and cartography held from October 24 to 26, 1957. The following specialists spoke in the plenary sessions of the conference: A. K. Baranov, Head of the GUGK, on "Soviet Geodesy, Aerophotography, and Cartography over the Past Forty Years," A. S. Nikolayev, Major-General of the Technical Troops, "The Part Played by Geodesy in the Defense of the USSR," Professor G. V. Romanovskiy, "The Present State and Perspective Development of Aerophotography in the USSR," Professor P. S. Zakharov, "The Present State and Future Prospects of Geodesic Instruction in the USSR," Docent N. S. Babin, "Today's Topographical Maps and the Fundamental Problems and Tasks of Topography," Professor Ya. I. Bulanshe, Doctor of Physical-Mathematical Sciences, "Soviet Participation in the International Geophysical Year," In the section on Geodesy reports were given by the following personnel: V. A.

Veitonen, Candidate of Technical Science, reported on "The Use of Light Locations for the Establishment of Geodetic Nets," S. V. Leiteyev, Docent, spoke on "The Tasks and Present State of Production of Geodetical Instruments," Docent A. M. Kuznetsov reported on "The Present State and Possibilities of Development of Astronomy," Engineer V. I. Shalinger spoke on "The Present State and Possibilities for Development of Terrain Leveling Instruments," In the section on aerophotographical geodesy Professor M. D. Koshkin gave a lecture on "The Automation of the Outer Orientation of Flying Elements, and Methods for Evaluating the Precision of the Instruments Used," Docent A. I. Shertan reported on "The Tasks and Prospects of the Development of Photogrammetry," B. A. Merkulov spoke on "The Rectification of Photogrammetrical Nets," L. M. Golitsina, Candidate of Geographical Sciences, dealt with the problems of topographical deciphering of aerial photographs. In the section on cartography Docent P. A. Starostin spoke on "The Present State and Prospects of Mathematical Cartography," Professor Yu. V. Filippov discussed the achievements and prospects in the field of cartography and atlases in the USSR, P. K. Koldayev, Candidate of Technical Science, spoke on "Tasks and Means for Perfecting the Stereoscopic Reproduction of the Map Relief," Docent I. F. Zaritskiy spoke on "Cartographing of Climatic Conditions in the USSR," M. P. Garkunov, Candidate of Technical Sciences, reported on "Non-Reflective Photoresistive Layers and Transparencies in Cartography," Engineer B. A. Merkulov spoke on "The Application of Microfilm Photographs in Cartography."

Docent I. F. Zaritskiy spoke on "Cartographing of Climatic Conditions in the USSR," M. P. Garkunov, Candidate of Technical Sciences, reported on "Non-Reflective Photoresistive Layers and Transparencies in Cartography," Engineer B. A. Merkulov spoke on "The Application of Microfilm Photographs in Cartography."

MERKULOV, B.A.

New method of protecting screw threads. Metallurg 9 no.4:39
Ap '64. (MIRA 17:9)

1. Vyksunskiy metallurgicheskiy zavod.

CHUBUKOV, A.A., inzh.; KAGAN, I.L., inzh.; GALADZHEVA, M.Ya., inzh.;
KRAVTSOV, B.M., inzh.; MERKULOV, B.A., inzh.

The OSN-12 automatic welder for welding girth joints. Svar.
proizv. no.4:37-38 Ap '65. (MIRA 18:6)

1. Rostovskiy-na-Donu nauchno-issledovatel'skiy institut
tehnologii mashinostroyeniya.

MERKULOV, D.M., inzh.; MERKULOVA, G.M., inzh.

Assembly of precast reinforced concrete arches from the ice.
Transp.stroi. 12 no.10:20-21 0 '62. (MIRA 15:12)
(Krasnoyarsk--Bridge construction)
(Bridges, Concrete)

MERKULOV, D.M., inzh.

Flow of small constantly running streams without formation
of layers of ice at bridges and pipes. Transp. stroi. 15
no.11:41-43 N '65. (MIRA 18:11)

MERKULOV, P. N.

36705. K Voprosu O Reshenii Termicheskoy Obrabotki Ontargov. Trudy Tsi. Izh. An.
In-Ta. Vyp. 3, 1949 s. 99-109.


SO: Letopis' Zhurnal'nykh Statey, Vol. 50, Moskva, 1949

S/148/60/000/008/011/018
A161/A029

AUTHORS: Fominykh, I.P.; Volodin, I.P.; Merkulov, F.N.; Ryazantseva, V.N.

TITLE: Speeding up the Annealing of Malleable Cast Iron Modified by Boron and Bismuth

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. - Chernaya metallurgiya, 1960, No. 8, pp. 153 - 159

TEXT: At the Gor'kovskiy avtozavod (Gor'kiy Automobile Works), where malleable cast iron had been modified by boron and bismuth (Ref. 7), the annealing time had been cut from 60 to 35 - 36 hours (annealing in electric 25-t chamber furnace). The Tul'skiy kombaynovyy zavod (Tula Harvesting Combine Works), aided by Tul'skiy mekhanicheskiy institut (Tula Institute of Mechanics), utilized the Gor'kiy works experience and attempted to obtain malleable cast iron with raised strength on account of the predominating perlitic component. Cast iron K4-45-5 (Kch-45-5) used for the experiments had the following composition: (in%): 2.45-2.8 C; 0.9-1.3 Si; 0.45-0.65 Mn; not above 0.12 S; 0.15 P, and 0.07 Cr. It was smelted in a cupola furnace and superheated in an acid electric furnace. The powdered modifier consisted of ferro-silico-boral (an alloy of iron-silicon-boron-

Card 1/5

S/148/60/000/008/011/018
A161/A029

Speeding up the Annealing of Malleable Cast Iron Modified by Boron and Bismuth

-aluminum, with 5-15% B) and metallic bismuth, and was placed in a paper bag and held into the metal jet during pouring into the ladle; 0.003-0.004% B and 0.002-0.003% Bi was used (of the metal weight). Parts for a new machine were cast from modified cast iron. The parts and specimens were annealed in laboratory PN-11 (PN-11) chamber furnaces. Three microphotograph sets show the structure of the initial and of the modified cast iron (a and b, Figs. 1,3,4). It was stated that boron and bismuth refined dendrites; the modified iron contained a considerably higher quantity of carbides; it was assumed that cementite of modified iron contained less carbon and hence had other properties than usual, viz. lower stability, which had been proven by I.F. Kurtov et al. (Ref. 7); graphite grains were refined. Five different annealing process versions were tried to study the decomposition rate of primary cementite in the first stage of graphitization. It was considerably more intense in modified cast iron than in the initial cast iron. Cementite of modified cast iron was less stable at all temperatures between 850 and 1,050°C, and the metal had a high tendency to chilling at usual and higher Si content. The finally chosen annealing schedule is shown in Figure 6, with a total time of only 8 hours. It produced malleable cast iron with a tensile strength not below 45 kg/mm² and an elongation of 5% and more only when the boron-

Card 2/5

S/148/60/000/008/011/018
A161/A029

Speeding up the Annealing of Malleable Cast Iron Modified by Boron and Bismuth

-bismuth modifier was used. The experimental results fully confirmed the data obtained by I.F. Kurtov (Ref. 7) and N.G. Girshovich (Refs. 2,8) and proved that addition of boron and bismuth greatly speeds up the annealing of malleable cast iron and improves graphitization but has no marked effect on strength. The author points out that in American practice high-strength cast iron with lowered plasticity is used very extensively, and suggests the application of such cast iron with an ultimate strength which is higher by a factor of 1.5. There are 6 figures and 8 Soviet references.

ASSOCIATION: Tul'skiy mekhanicheskiy institut (Tula Institute of Mechanics) and Tul'skiy kombaynovyy zavod (Tula Harvesting Combine Works) ✓

SUBMITTED: April 6, 1960

Card 3/5

S/137/61/000/003/065/069
A006/A101

AUTHOR: Merkulov, F. N.

TITLE: The effect of quench-hardening temperature on mechanical properties of some new stamp steel

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 3, 1961, 11, abstract 3179 ("Sb. tr. Tul'sk. mekhan. in-ta", no. 15, 1960, 84-94)

TEXT: The author investigated the effect of high quenching temperatures on the mechanical properties of two grades of stamp steel, 5XHT (5KhNT) and 5XH \bar{B} (5KhNV), containing in %: C 0.55-0.56; Mn 0.63-0.64; Si 0.28-0.31; Cr 0.87-1.07; Ni 1.5-1.56. Improved mechanical properties including a_c , were observed at a quenching temperature raised up to 880 - 900°C as compared to conventional temperatures as high as 840 - 860°C. It was established that a rise of temperature from 840 to 880°C caused higher hardness, a_c , σ_b , σ_s , ψ and δ after tempering at 450, 500 and 600°C. The steels offer high stability of the hardened structure against tempering and show approximately equal mechanical properties at both room and elevated temperatures of tests (100 - 600°C). 5KhNT steel is less hard than 5KhNV steel but shows higher plasticity and ductility. 5KhNV steel is highly resistant

Card 1/2

The effect of quench-hardened temperature ...

S/137/61/000/003/065/069
A006/A101

to deformation and heat and can be recommended for the manufacture of large-size dies. To improve the properties of the steels the quench-hardening temperature should be raised to 880 - 900^oC.

T. R.

[Abstractor's note: Complete translation.]

Card 2/2

S/137/61/000/003/029/069
A006/A101

AUTHOR: Merkulov, F.N.

TITLE: Investigation of the hardenability of 5XHT (5KhNT) and 5XHB (5KhNV) die steels

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 3, 1961, 44, abstract 3D344 ("Sb. tr. Tul'sk. mekhan. in-ta", no. 15, 1960, 95 - 99)

TEXT: The hardenability of 5KhNT and 5KhNV die steels was determined by butt hardening on standard specimens with subsequent determination of hardness (840 and 880°C heating temperature) and by the method of distributing the hardness over the section of a die cube of 340x340x340 mm dimensions after quench hardening from 830, 860 and 880°C under conditions approaching practical ones. With quenching temperatures increasing from 840 to 880°C, the hardenability of 5KhNT and 5KhNV steel increases. The deep hardenability of these steels at the 880°C quench hardening temperature excludes the application of repeated quench hardening of dies after reconditioning of the worn out piece. A.B.

[Abstracter's note: Complete translation.]

Card 1/1

S/123/61/000/010/009/016
A004/A104

AUTHOR: Merkulov, F. N.

TITLE: Investigating the abrasion wear of forging and pressing dies

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 10, 1961, 7, abstract
10V40 ("Sb. tr. Tul'sk. mekhan. in-ta", 1960, no. 15, 136-144)

TEXT: The author describes the results of investigations carried out at Tula plants to study the effect of the initial hardness of dies, their complexity and operation conditions on its abrasion. Die-forging was effected in test dies on forging hammers with the dropping part weighing 1-3 tons and on 1,500-ton capacity crank presses (MKP-1500). The forgings were made of the steel grades 40, 45, 50 and 40X (40Kh). Prior to die-forging the blanks were heated in flame furnaces up to 1,150°C. As lubricant an NaCl solution with 5% NaNO₃ was used on the forging hammers, while a mixture of machine oil and graphite was used on the presses. It was found that up to 60% of the dies get out of order because of abrasion wear. Above all the projection bridge and the contours of the narrowest edges of the operating hollow of the die are particularly subjected to abrasion. The hardness of the dies has an essential effect on their wear. The

Card 1/2

Investigating the abrasion wear ...

S/123/61/000/010/009/016
A004/A104

author presents a nomogram for the selection of the die hardness depending on the groove depth and the die volume. An overstated weight of the dropping part of the hammer accelerates the die wear. The abrasion wear of dies can be reduced by efficient lubrication, elimination of scale, strict adherence to the temperature range of forging and appropriate selection of hardness and the dimension of the burr grooves. There are 8 figures and 2 references.

Ya. Golombik .

[Abstractor's note: Complete translation]

Card 2/2

MERKULOV, G.; KOVAL'CHUK, I.; PUGOLOVKIN, P.

Expansion of large-block construction in Krivoy Rog, Sevastopol,
and Kadiyevka. Stroitel' no.5:10-12 My '59. (MIRA 12:8)

1. Instruktor peredovykh metodov truda Ukrainskogo instituta
Orgstroy (for Merkulov).
2. Nachal'nik uchastka No.2 Upravleniya
nachal'nika rabot No.191 (for Koval'chuk).
3. Glavnyy inzhener
tresta Kadiyevpronzhilstroy (for Pugolovkin).
(Krivoy Rog--Apartment houses)
(Sevastopol --Apartment houses)
(Kadiyevka--Apartment houses)

MERKULOV, G. A.

A short course in pathologico-histologic techniques. Leningrad Medgiz, 1951. 187 p.

MERKULOV, G.A.

Application of dyeing substances of *Vaccinium myrtillus* in pathological and histological techniques. Arkh. pat., Moskva 14 no.4:93-94 July-Aug 1992. (GIML 23:2)

1. Of Leningrad Scientific-Research Institute for Diseases of the Ear, Throat, Nose, and Speech (Scientific Supervisor -- Prof. V. I. Voyachek, Active Member AMS USSR).

MERKULOV, G.; STERN, P.; FUKAREK, V.

Effect of benemid on PAS excretion; in a case of pulmonary tuberculosis with diabetes insipidus. Tuberkuloza, Beogr. 8 no.2:106-109 Mar-Apr 56.

1. Gradska poliklinika i Farmakoloski institut Medicinskog fakulteta Sarajevu.

(TUBERCULOSIS, PULMONARY, compl.

diabetes insipidus, eff. of probenecid on PAS urine excretion (Ser))

(DIABETES INSIPIDUS, compl.

tuberc., pulm., eff. of probenecid on PAS urine excretion (Ser))

(PARA-AMINOSALICYLIC ACID, in urine

excretion inhib. by probenecid in pulm. tuberc. with diabetes insipidus (Ser))

(URINE,

PAS, excretion inhib. by probenecid in pulm. tuberc. with diabetes insipidus (Ser))

(PROBENECID, eff.

inhib. of PAS urine excretion in pulm. tuberc. with diabetes insipidus (Ser))

MERKULOV, Grigoriy Andreyevich, professor; MIKHAYLOV, S.S., redaktor;
RULEVA, M.S., tekhnicheskij redaktor

[Course on techniques in pathological histology] Kurs patologogisto-
logicheskoy tekhniki. Izd. 3-e, ispr. i dop. [Leningrad] Gos. izd-vo
med. lit-ry, Leningradskoe otd-nie, 1956. 261 p. (MLRA 9:10)
(HISTOLOGY, PATHOLOGICAL)

BERKULOV, Gligorije, Dr. (Sarajevo)

Pulmonary manifestations of scleroderma. Tuberkuloza, Beogr. 9 no.1:
41-43 Jan-Feb 57.

(SCLERODERMA, manifest.
lungs (Ser))

(LUNGS, in var. dis.
scleroderma, manifest. (Ser))

MERKULOV, Grigoriy Andreyevich, doktor; CHISTOVICH, D.N., zasl. deyatel'
nauki, prof., red.; RUSLEVA, M.S., tekhn. red.

[Course in pathohistological technique] Kurs patologogistologicheskoi tekhniki. 4 izd. Leningrad, Medgiz, 1961. 339 p.
(MIRA 15:3)

(HISTOLOGY, PATHOLOGICAL)

ACC NR: AP7001200 (A) SOURCE CODE: UR/0407/65/000/05-/0093/0097

AUTHOR: Grodzinskiy, E. Ya. (Moscow); Merkulov, G. V. (Moscow)

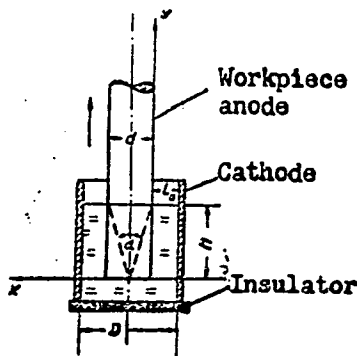
ORG: none

TITLE: Formation of conic surfaces by electrochemical machining

SOURCE: Elektronnaya obrabotka materialov, no. 5-6, 1965, 93-97

TOPIC TAGS: electrochemical machining, metal machining

ABSTRACT: Cone formation on a cylindrical or prismatic billet by electrochemical process is considered. The billet is first immersed in electrolyte and then gradually withdrawn (see figure). A purely empirical method yielded barrel-shaped cones and low accuracy in the final size. Hence, the present article tries to establish mathematical relations between the machining parameters and the required cone vertex angle and also tries to map out principal features of necessary equipment. A final formula for the rate-of-withdrawal is:



$$v = \frac{2 \cdot \vartheta \cdot \eta \cdot U \cdot \kappa}{J \cdot \lg \frac{a}{2} \left(2l_0 + \lg \frac{a}{2} \cdot y \right)}$$

where ϑ - electrochemical equivalent of electrolyte;
 η - current efficiency, %;

Card 1/2

ACC NR: AP7001200

U - interelectrode voltage; γ - electrolyte conductivity; j - specific weight of billet material; α - cone vertex angle; l_0 - interelectrode distance; y - vertical coordinate. The formula permits proportioning various parameters in such a way that the cone generatrix is a straight line. The development of a semiautomatic machine for handling up to 10 billets, 0.5-8 mm diameter, 30-800 mm long is mentioned; voltage used, 12-18-24 v; current, up to 300 amp. A machining error of 0.01-0.05 mm obtained in experiments is claimed. Orig. art. has: 2 figures and 21 formulas.

SUB CODE: 13 , 09 / SUBM DATE: none

Card 2/2

L 06112-67 EWT(d)/ESS-2/EWT(l)/EWT(m)/EWP(f)/EEQ(k)-2/EWP(c)/EWP(h) LJP(c) AST/
ACC NRGAP6018713 (A) SOURCE CODE: UR/0029/66/000/001/0022/0023
TT/WW/GW

AUTHOR: Merkulov, I. (Engineer; Designer; Chairman of the Rocket Section of the All-Union Committee on Astronautics)

ORG: Rocket Section, All-Union Committee on Astronautics, DOSAAF, SSSR (Raketnaya sektsiya, Vsesoyuznyy komitet kosmonavtiki DOSAAF SSSR)

TITLE: The A B C of space flights

SOURCE: Tekhnika-molodezhi, no. 1, 1966, 22-23

TOPIC TAGS: spacecraft navigation, space orientation, spacecraft, spacecraft landing, spacecraft control, spacecraft propulsion, spacecraft guidance

ABSTRACT: Spacecraft guidance, control, stabilization, correction, deceleration, and landing systems are discussed. It is noted that the exhaust velocity of a spacecraft is 2000 - 4000 m/sec and that a parachute-landing engine system was employed in the soft landing of the "Voskhod" spacecraft. The engine was switched on when the spacecraft was close to the Earth's surface so that it decelerated the drop of the parachute reducing the velocity to a negligible value at the moment of landing. Orig. art. has: 3 figures.

SUB CODE: 22, 21/ SUBM DATE: none

Card 1/17C

MERKULOV, I. A.

PHASE I Treasure Island Bibliographical Report

AID 2.8 - I

BCCZ

Call No.: AF10007

Authors: BAYEV, I. A. and MERKULOV, I. A.

Full Title: ROCKET-AIRCRAFT, (JET PULSED "SANTO") (2nd. ed.)

Transliterated Title: Samolet-ruketa (roktimaya aviatsiya)

Publishing Data

Originating Agency: None

Publishing House: State Publisher House of Technical and Theoretical Literature

Date: 1957 No. vol.: 14 No. copies: 15,000

Editorial Staff

Editor: None

Techn. ed.: None

Ed.-in-Chief: None

Appraiser: None

Text Data

Coverage: This is a popular booklet on the jet propulsion of today and tomorrow. The author describes way the achievement of high speeds requires the application of new techniques, and how this progress has been made possible by the genius of USSR scientists. A description of reaction engines with liquid oxidizers and of ram-jet and ram-turbine engines follows. In the last three chapters the author considers the problems of supersonic speeds, and the jet propulsion and flight of the future. The booklet is provided with 18 diagrams.

1/2

Summary D-242047, 26 May 55

Card 2/2

AID 2.8 - I
Call No.: AF990472

• Full Title: ROCKET-AIRCRAFT, (OST P-OPULYARNAYA AVIATSIYA) (3rd. ed.)

Text Data

Coverage (cont.): This is an interesting popular booklet, although it is devoted to claims of Russia's priority in the development of aviation.

Purpose: Booklet for popular education. Vol. 39 in the series of the Popular Scientific Library (Nauchno-populyarnaya biblioteka vypusk 39)

Facilities: A large number of Russian scientists connected with the historical development of aviation appear in the text.

No. Russian and Slavic References: None

Available: A.F.D., Library of Congress.

MERKULOV, I. A.

PHASE X TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 612 - X

BOOK

Call No.: AF646170

Author: MERKULOV, I. A.

Full Title: JET AVIATION

Transliterated Title: Reaktivnaya aviatsiya

PUBLISHING DATA

Originating Agency: All-Union Society for the Propagation of Political and Scientific Knowledge

Publishing House: "Znaniye"

Date: 1954

No. pp.: 31

No. of copies: 75,000

Editorial Staff: None

PURPOSE AND EVALUATION: This is a popular booklet written for the wide circle of members of the DOSAAF, All-Union Voluntary Society for the Promotion of the Army, Aviation and Navy. It gives basic information on various kinds of jet engines and a short outline of the history of their development, which is represented as an entirely Russian achievement. Engines described in the text are well known and do not represent any special interest.

TEXT DATA

Coverage: The author compares the possibilities of propeller-driven aircraft with those of jet aircraft. He explains the principles of operation of: 1. Liquid propellant jet engines; 2. Ram-jets;

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MERKULOV, I.A.

VARVAROV, N.A.; DOBRONRAVOV, V.V., professor, doktor fiziko-matematicheskikh nauk; MERKULOV, I.A., inzhener-konstruktor; SERYAPIN, A.D., laureat Stalinskoy premii; STANYUKOVICH, K.P., professor, doktor tekhnicheskikh nauk; KHEVTSSEVICH, Yu.S., kandidat tekhnicheskikh nauk; SHTERNFEL'D, A.A., laureat mezhdunarodnoy pooshchritel'noy premii po astronavtike.

Enroute to the stars. Tekh.mol. 22 no.7:1-7 J1 '54.

1. Predsedatel' sektiia astronavtiki pri Tsentral'nom aeroklube SSSR imeni Chkalova (for Varvarov).
 2. Zamestitel' predsedatelia nauchno-tekhnicheskogo komiteta po kosmicheskoy navigatsii, sektiia astronavtiki (for Dobronravov).
 3. Predsedatel' nauchno-tekhnicheskogo komiteta po raketnoy tekhnike, sektiia astronavtiki (for Merkulov).
 4. Predsedatel' nauchno-tekhnicheskogo komiteta po biologii kosmicheskogo poleta, sektiia astronavtiki (for Seryapin).
 5. Chlen nauchno-tekhnicheskogo komiteta po astronomicheskim i fizicheskim problemam (for Stanyukovich), sektiia astronavtiki.
 6. Predsedatel' nauchno-tekhnicheskogo komiteta po radio-teleupravleniyu (for Khevtsevich), sektiia astronavtiki.
 7. Predsedatel' nauchno-tekhnicheskogo komiteta po kosmicheskoy navigatsii (for Shternfel'd), sektiia astronavtiki.
- (Interplanetary voyages) (Space ships) (MLRA 7:6)

MERKULOV, Igor' Alaksayevich; KIPNIS, S. Ye., redaktor; ISLENT'YEVA, P.G.
tekhnicheskiiy redaktor.

[Cosmic rockets; from a lecture series "Modern problems in astronautics" (based on "Sunday lectures" of the Polytechnical Museum) Kosmicheskie rakety; iz tsikla lektzii "Sovremennye problemy astronautiki" (po materialam "Voskresnykh chtenii" Politekhniceskogo muzeia) Moskva, Izd-vo "Znanie," 1955. 31 p. (Issoiuznoe obshchestvo po rasprostraneniuiu politicheskikh i nauchnykh znanii. Ser. 4, no.36) (MLRA 8:11)

1. Predesdatel' nauchno-tekhnicheskogo komiteta reaktivnoy tekhniki Tsentral'nogo aerokluba SSSR imeni Chkalova.
(Rockets)Aeronautics))

BAYEV, Lev Konstantinovich; MERKULOV, Igor' Alekseyevich; PLONSKIY, A.F.,
redaktor; GAVRILOV, S.S., tekhnicheskii redaktor

[Rocket plane; jet aviation] Samolet-raketa; reaktivnaia aviatsiia.
Izd. 3-e, perer. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1956.
55 p. (Nauchno-populiarnaia biblioteka, no.39) [Microfilm] (MLRA 9:8)
(Airplanes--Jet propulsion)

AID P - 4679

Subject : USSR/Aeronautics - Space ships
Card 1/1 Pub. 58 - 5/14
Author : Merkulov, Designer, Chairman of the Scientific and
Engineering Committee, Jet Propulsion Section (Aero-
nautics), Chkalov's Central Aeroclub, USSR.
Title : Space rockets
Periodical : Kryl. rod., 4, 8-11, Ap 1956
Abstract : The author passes in review the basic technological and
engineering problems presently facing the designers of
space ships, and outlines some of the current Soviet
ideas as to the form and construction of the latter.
3 designs and 1 sketch.
Institution : None
Submitted : No date

MERKULOV, I. A., and BAYEV, L. K.

Rocket Aircraft published by the Ministry of Defense 1957

PHASE I BOOK EXPLOITATION

330

Merkulov, Igor' Alekseyevich

Gazovaya turbina (The Gas Turbine) Moscow, Gostekhizdat, 1957.
54 p. (Nauchno-populyarnaya biblioteka, vyp. 94) 75,000 copies
printed.

Ed. (title page): Kvasnikov, A. V., Honored Worker in Science and
Technology, Prof.; Ed. (inside book): Plonskiy, A. F.;
Tech. Ed.: Gavrilov, S. S.

PURPOSE: This booklet is written for publication in a series devoted
to the popularization of science and technology.

COVERAGE: The author is concerned with steam and gas turbines in
general. Only in the last 8 pages does he describe turbo-
jet and turboprops and give a few data on aircraft equipped
with them. He mentions a number of personalities working
in the field of the internal combustion engine. Those more
recently connected with the development of the gas turbine
include: Academician Stechkin, B. S., called by the
author the creator of the modern gas turbine, who made an

Card 1/6

The Gas Turbine

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important contribution to the formulation of gas turbine theory, in particular to the theory of bladed machines and to the analysis of centrifugal and axial compressors; Professors Ushakov, K. A.; Dmitriyevskiy, V. N.; Kholshchevnikov, K. N.; and Kazandzhan, P. K., who did important theoretical and experimental research in compressors; Member, AS, Ukrainian SSR, Proskura, G. F., who worked on the theory of bladed machines; Professors Zhiritskiy, G. S.; Kvasnikov, A. V.; Kirrillov, P. I.; Shnee, Ya, I.; and Zotikov, G. P., who studied gas turbine theory; Uvarov, V. V., who solved the problem of a blade of constant efficiency along its length; and Antonov, O. K., who designed the passenger aircraft "Ukraina". This aircraft is equipped with four turboprops, has a 600 km/hr cruising speed, and is described as one of the most economical of its kind. The author also gives some specific technical information. For example, the Leningradskiy metallicheskiy zavod (Leningrad Metal Plant) before the Second World War built a 100,000-hp steam turbine, and after the war a 150,000-hp unit. The peripheral speed of modern centrifugal compressors attains 500 m/sec. The pressure of the air at the outlet of the impeller averages

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2.5 atm, and is 5 atm. at the outlet of the diffuser. The efficiency of centrifugal compressors does not exceed 70-75%, when axial compressors attain 85-90% efficiency. Modern turbine blades made of special alloys operate safely when the temperature of the incoming gases is 900°C. Research is under way for the application of ceramics to blade manufacture in order to make higher operating temperatures possible. When powdered coal is used as fuel, some salt particles 0.03-0.05 m. in diameter are formed during combustion due to impurities. These particles may damage modern turbine rotors which turn at 5,000-10,000 rpm or even faster. The efficiency of modern gas turbine plants is 25-30%. There are about 200 stationary gas turbine plants in the USSR and their total power exceeds 1,000,000-hp. In turbines of the Nevskiy mashinostroitel'nyy zavod (Neva Machine-building Plant in Leningrad) air is compressed to 4.6 atm., the compressor efficiency is 80% and the rotor turns at 5,000 rpm. The gas temperature at the inlet of the turbine is 600°C and the turbine develops 6,100 kilowatt. The compressor absorbs 4,600 kw. and the available power is 1,500 kw. The Leningradskiy metallicheskiy zavod (Leningrad Metal Plant) uses larger gas

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turbine power plants: one of them has three compressors (large, medium and low pressure) and two turbines (low and high pressure). The high-pressure turbine develops 22,000 kw, of which 10,000 kw are used to drive the high pressure compressor, so that 12,000 kw is available for the generator. After the passage through the turbine at 3 atm. pressure and 420°C temperature the gases enter an intermediate combustion chamber, where they reach 650°C and are used to drive the low-pressure turbine producing the 19,000 kw necessary to drive the low and medium-pressure compressors. The overall efficiency of this arrangement is approximately 25%. If the temperature of the gases at the inlet to the turbine could be increased from 600-700°C to 900°C, the efficiency would increase from 25% to 40%. In the Kolomenskiy parovozostroitel'nyy zavod (Kolomna Locomotive Works) a 6,000-hp gas turbine locomotive is under construction. Turbojet engines can work efficiently at speeds of 3000 km/hour and altitudes of 25-30 km. A sketch and diagram are given of a 13-stage, 1/10 pressure ratio, two-compressor, turbojet engine, which develops a 5,000 kg thrust on fuel consumption of 1 kg fuel per second, and weighs 1,500 kg.

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The Gas Turbine

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The following examples of jet propulsion efficiency are given: 1) a four-turbojet aircraft, 20,000-hp total power, 300 m/sec speed, developing 14-hp per one kg of its weight, or 7 times better than a piston-engine aircraft 2) a turbojet fighter with triple compressors, 16-stage, 1/12.5 compression ratio, and a 3-stage turbine, developing 7 tons thrust, with a 1,700 km/hr speed and 20,000 m. ceiling, 3) a 70-ton bomber with 4 turbojets and a total thrust of 14,400 kg, top speed of 1,100 km/hr, and an operational radius of 4,000 km. There are no references.

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The Gas Turbine

Gas Turbine in the National Economy

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AVAILABLE: Library of Congress

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AC/vm

May 29, 1958

MERKULOV, I.

85-9-18/33

AUTHOR: Merkulov I., Designer, Chairman of the Scientific Technical Committee for Jet Technology, Astronautics Section, Central Aeroclub of the USSR

TITLE: Modern Jet Planes (Raketnyye Samolety Nashikh Dney)

PERIODICAL: Kryl'ya Rodiny, 1957, ⁸Nr 9, pp. 17-19 (USSR)

ABSTRACT: The author seeks to give the readers a general idea of the modifications which had to be introduced in the construction and the design of the planes in order that the possibilities offered by the powerful modern engines be better used. In that connection he illustrates his text with 12 drawings showing various unspecified planes, and offers comments on some characteristics of these planes. The author's comments of conceivable actual interest are rendered here below: Fig. 3: Jet fighter (possibly Soviet fighter "Sukhoi"). Delta wing; weight at take-off - 13 t.; length of the plane - 17 m.; wing span - 16 m.; gross wing area - 85 sq.m. Two turbojet engines with 13-stage compressors and 2-stage turbines. Total thrust - 7.4 t. Air intakes situated at the sides of the fuselage. Maximum speed (at the altitude of 15 km.) - 1150 km./h. Fig. 4: Delta wing single-seat jet fighter (the drawing recalls the British fighter SK-53). Normal thrust of the turbojet

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85-9-18/33

Modern Jet Planes (Cont.)

engine - 5 t.; augmented thrust - 7 t. The 16-stage axial compressor, formed of 2 separate aggregates of 9 and 7 stages, increases the air pressure 12.5 times. 3-stage gas turbine. Takeoff weight over 12.5 t., maximum speed - 1500 km./h. Fig. 5: Jet fighter (the drawing recalls the US fighter F-104). A thin trapeziform wing, with a very small aspect ratio. Wing span - 6.68 m. Width of the fuselage at wing-root - 2.10 m. The wing is made of one single metal plate; its leading and trailing edges are very sharp. Length of the plane - 16.9 m. One turbojet engine; thrust - 6800 kgs. The weight at takeoff - approximately the same. The speed is about twice the speed of sound. First test flights with the plane began in February 1954. Fig. 9: Heavy bomber (the drawing recalls the US bomber B-52). Weight - 170 t.; eight turbojet engines; total thrust 40 t.; maximum speed - 1050 km./h.; range - 12,800 km. Crew of 9. The shoulder-high wing has the form of an arrow. Fig. 11: Experimental ramjet fighter-interceptor (possibly French experimental fighter "Leduc"). Destined to develop speeds equaling twice the speed of

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85-9-18/33

Modern Jet Planes (Cont.)

sound, and expected to be able to intercept a modern bomber flying at an altitude of 15 km. within less than 3 minutes, including the time necessary to prepare the takeoff, and to effect it. "Presently an object of intensive studies". Fig. 12: Experimental plane (unidentified). All-metal. One liquid fuel engine with 4 firing chambers. Liquid oxygen and the alcohol are fed into the engine by a turbine-actuated pump. The thrust can be controlled by successive switching-on of the firing chambers, each of which develops a thrust of 680 kgs. Full weight about 8 t.; maximum speed - 1600 km./h. at the altitude of 18 km., and 2700 km./h. at the altitude of 24 km. Duration of the flight with all the engines switched on-4.5 minutes. During the test flights this plane had to be lifted to the altitude of 7-8 km. by another powerful multi-engine plane. Rated speed at the altitude of 21 km. - 2650 km./h. The same plane reached the altitude of 27 km. A plane [it is not clear whether the author speaks of the same plane or of another one] equipped with a liquid fuel engine has presently developed the speed of over 3000 km./h. As far as the thrust power of liquid fuel engines is concerned, the author, speaking in very general terms about the developments in this field, indicates that at present 1 kg. of fuel consumed by jet engines in 1 second is supposed to develop a thrust of, approximately,

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85-9-18/33

Modern Jet Planes (Cont.)

250 kgs., and he mentions the figure of 400 kgs per kg./sec. as a goal which shall be reached sometime. 12 drawings.

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MERKULOV, I. A

25-9-15/40

AUTHOR: Merkulov, I.A., Chairman of the Technical Committee of Jet Engineering of the Central Aeroclub of the USSR

TITLE: A Prominent Scholar (Vydayushchiysya uchenyy)

PERIODICAL: Nauka i Zhizn', 1957, # 9, p 32 (USSR)

ABSTRACT: On the occasion of the 100th anniversary of K.E. Tsiolkovskiy's birthday, the author recalls the great merits of this pioneer of space flight and rocket engineering. More than fifty years ago, Tsiolkovskiy established already the theory of space flight by means of a jet-powered flying apparatus and proved the possibility of launching rockets and their return to earth. He foresaw that propeller driven planes would be succeeded by those equipped with jet engines. The present development of jet and rocket engineering in the USSR is mainly based on Tsiolkovskiy's theories and led to the construction of the jet airliners "TY-104" and "TY-110" constructed by Soviet engineers under the supervision of Academician A.N. Tupolev. Artificial earth satellites will be the next stage in the development of flight engineering.

There is one figure.

ASSOCIATION: Nauchno-tekhnicheskii komitet reaktivnoy tekhniki Tsentral'nogo aerokluba SSSR (Scientific-technical Committee of Jet Engineering of the Central Aero-club of the USSR)

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TOKAREV, F.V., izobretatel', Geroy Sotsialisticheskogo Truda; SMIRNOV, I.V., izobretatel' v oblasti stroymaterialov; POKROVSKIY, G.I., professor, doktor tekhnicheskikh nauk; SHIRKOV, I.P., novator stroitel'noy industrii; CHIKIREV, N.S., novator; KOTOVA, S.A., novator, brigadir pryadil'shchits; LOGIN, M.I., izobretatel', inzhener; SLIVOKHIN, F.P., ratsionalizator; MERKULOV, L.A., izobretatel', konstruktor dvigateley; KOSMATOV, N.V., izobretatel' v oblasti kino; KHLEBTSEVICH, Yu.S., izobretatel', kandidat tekhnicheskikh nauk; SHCHADILOV, V.I., ratsionalizator-naladchik.

"Inventor" has a proud ring to it! Tekh. mol. 25 no.3:1-3 Mr '57.
(MIRA 10:6)

1. Deputat Verkhovnogo Soveta SSSR (for Shirkov). 2. Nachal'nik tsakha zavoda imeni Sergo Ordzhonikidze (for Chikirev). 3. Fabrika imeni Kalinina (for Kotova). 4. Termitnostrelochnyy zavod (for Login). 5. Zavod "Kauchuk" (for Slivochkin).

(Inventions)

PHASE I BOOK EXPLCITATION

1066

Merkulov, Igor' Alekseyevich, Chairman, Jet Engineering Committee of the Chkalov Central Aeroclub of the USSR

Iskusstvennyye sputniki - torzhestvo idey K.E. Tsiolkovskogo (Artificial Satellites, the Triumph of K.E. Tsiolkovskiy's Ideas) Moscow, Izd-vo "Znaniye", 1958. 68 p. (Series: Vsesoyuznoye obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy. Seriya IV, 1958, no. 8-9) 75,000 copies printed.

Sponsoring Agency: Vsesoyuznoye obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy.

Ed.: Islankina, T.F.; Tech. Ed.: Gubin, M.I.

PURPOSE: This book is intended for the general reader.

COVERAGE: The author of this popular booklet commemorates the centennial anniversary of the birth of the late Soviet scientist K.E. Tsiolkovskiy and eulogizes his achievement in establishing the fundamentals of space flight. He presents a brief biography of K.E. Tsiolkovskiy and a historical review of the development of Soviet jet aviation and rocket technology, glorifying the Soviet science

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• Artificial Satellites (Cont.) 1066

in launching Sputnik I and Sputnik II. A brief description of instrumentation and some qualitative data is given on Sputnik II. There are no personalities mentioned. There are 23 Soviet references.

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AVAILABLE: Library of Congress

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IS/sfm
1-7-59

PHASE I BOOK EXPLOTTATION

1029

Merkulov, Igor' Alekseyevich

Polet raket v mirovoye prostranstvo (Rocket Flight Into Outer Space) Moscow, Izd-vo DOSAAF, 1958. 87 p. 40,000 copies printed.

Ed.: Vasil'yev, A.A.; Tech. Ed.: Andrianov, B.I.

PURPOSE: This book is intended for the general reader.

COVERAGE: The booklet describes briefly in popular form the problems of celestial mechanics, the problems of rocket engineering and other basic concepts in the development of artificial satellites. The author emphasizes the leading role of Russian and Soviet scientists and inventors in the development of rocket techniques based on K.E. Tsiolkovskiy's ideas concerning outer space flights. All quantitative data, however, is based almost exclusively on existing and proposed American projects. No personalities are mentioned. There are no references.

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On the Threshold of Flights Into Outer Space

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1-7-59

МЕРКУЛОВ, И.А.

26 (1,4)

PHASE I BOOK EXPLANATION

SOV/25A3

Академия наук СССР. Laboratoriya dvigatelya Teoriya, konstruktivnaya, raschet i ispraniye dvigatelya vnutrennego sgoraniya (Theory Design, Calculation, and Testing of Internal Combustion Motors) Moscow, Izd-vo AN SSSR, 1958. 174 p. (Series: Itis: Trudy, vyp. 4) Krata slip inserted. 3,000 copies printed. Ed. of Publishing House: V.M. Klennikov; Tech. Ed.: T.A. Prusakova; Editorial Board: M.D. Agashev, Doctor of Technical Sciences, M.N. Zagayardin, Candidate of Technical Sciences, Yu. B. Sviridov, Candidate of Technical Sciences, S.Z. Irkutsev, Engineer, and E.G. Yevgrafov, Engineer.

FOUR: This book is intended for workers of scientific research institutes, students of schools of higher education (vuzes), design bureaus, and to promote exchange of experimental information on the thermodynamics of internal combustion engines.

COVERAGE: This collection consists of 14 articles based mainly on research work done by the author in 1955-1956. Part I is devoted to working processes in gas turbine power plants and to theoretical and experimental work connected with investigation of the flow of gases. Part II contains articles on the investigation of processes in piston engines. Part III deals with the measurement of high temperatures of gases. The collection is number 4 of the Transactions of the Engine Laboratory of the Academy of Sciences, USSR. No personalities are mentioned. There are no references.

1. Меркулов, И.А. and R.I. Tsanov (deceased). Calculation of gas characteristics in an adiabatic process with changing heat capacity taken into consideration. The equation obtained of the adiabatic curve of a gas with changing heat capacity and its graphical representation make possible a rapid and very accurate determination of the gas characteristics of a rapid and the combustion products of kerosene. Change of temperature in the adiabatic process are from 200° to 2,500°K. There are 3 Soviet references.

2. Ширшов, М.П. and I.I. Semenov. Problems of the Theory of Similitude in Flame Stabilization Behind a Poorly Streamlined Body. The author states that the problem is very complicated, and may be defined by a complex system of hydrodynamic differential equations and by chemical kinetics and diffusion. This article considers only stationary processes in which the fields of components of velocity vectors, pressure, density, etc., are only functions of three-dimensional coordinates and are independent of time. In these conditions it is no longer necessary to formulate the initial conditions. Experimentally shown that bodies (stabilizers) in this case, the circulation zone behind the stabilizer is the ignition source. There are 6 references: 4 Soviet, and 2 English.

6. Калинин, Е.К. Calculation of Hydraulic Losses in the Flow of Gases in Heat Exchangers Through Channels or Lengthwise Through Pipes. The article consists of two parts. The first presents a method for calculating gas characteristics for any system of flows in the outlet from a heat exchanger based on heat transfer data. Part two presents a method for calculating gas characteristics for any system of flows in the outlet from a heat exchanger. It is possible to determine by the second method the gas characteristics in the outlet without making a full heat calculation and without knowing the diameter of pipes, and in special cases without knowing the diameter of pipes. It is also possible to determine the M number directly in the outlet and inlet according to the given hydraulic resistance without making a heat calculation. There are 2 Soviet references.

MERKULOV, I.A.; TUMANOV, R.I. [deceased]

Calculating the parameters of a gas in adiabatic process taking into
consideration changes in heat capacity. Trudy Lab.dvig. no.4:32-43
'58. (MIRA 12:11)

(Thermodynamics)

1(2), 1(3), 26(1)

AUTHOR: Merkulov, I. Engineer

SOV/29-58-11-5/28

TITLE: Automatic Airplanes
(Samolety-avtomaty)

PERIODICAL: Tekhnika molodezhi, 1958, Nr 11, pp. 5 - 7 (USSR)

ABSTRACT: This is a scientific article written on the basis of foreign magazine publications and intended for the lay public. No detailed sources are given. The article describes the various propulsion methods used in modern aeronautics, automatic and remote control, as well as the use of unmanned planes in actual life. There are 6 figures.

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MERKULOV, L.

PHASE I BOOK EXPLOITATION

SOV/4693

Nekhozhennymi tropami Vselennoy (Untrodden Paths of the Universe) Moscow, Izd-vo "Pravda," 1959. 63 p.
(Series: Biblioteka "Komsomol'skoy pravdy," no. 11)
131,000 copies printed.

Ed.: V. Kukushkin; Tech. Ed.: L. Novikova.

PURPOSE: This popular science booklet is intended for the general reader.

COVERAGE: The booklet contains 14 articles dealing with early and recent efforts and accomplishments in space exploration. Though popular in style, the articles are written by leading Soviet scientists in the field. The contributions of K. E. Tsiolkovskiy to space science are briefly presented. Satellites, space rockets, future space craft, and certain pertinent engineering problems are discussed. No personalities are mentioned. No references are given.

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Untrodden Paths of the Universe

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ISAEV, Petr Kuz'mich; KAZNEVSKIY, Viktor Pavlovich; LUTSKIY, Valeriy Konstantinovich; RAPOPORT, Tamara Lyudvigovna; DOBRONRAVOV, V.V., prof., retsenzent; FOMIN, N.A., prof., retsenzent; MERKULOV, I.A., retsenzent; IL'YASHENKO, S.M., kand.tekhn. nauk, retsenzent; VARVAROV, N.A., retsenzent; PANTELEYEV, V.G., retsenzent; GLUKHOV, V.V., retsenzent; GORODENSKIY, L.M., red.; FURMAN, G.V., tekhred.

[Artificial earth satellites; 100 questions and answers]
Iskusstvennyye sputniki zemli; 100 voprosov i otvetov. Pod red. V.P.Kaznevskogo. Moskva, Obshchestvo po rasprostraneniю polit. i nauchn.znaniy, 1959. 95 p. (MIRA 12:6)
(Artificial satellites)

МЕРКУТОВ, И. А.

SOV/73-59-3-9/48

22(1)

AUTHORS:

Korotkevich, M. I., Professor; Pobodonostov, Yu. A., ~~Dr. Sc.~~
Candidate of Technical Sciences; Kob-
zarev, V. P., all Doctors of Technical Sciences; Kob-
zarev, A. A.; Levin, V. R. and Uralin, I. V. - all Pro-
fessors; Abilants, Y. Kh. and Merkulov, I. A. - both
Candidates of Technical Sciences

TITLE:

Our Readers Suggest (Mashi chitatel'ni predlaganiya)

PERIODICAL:

Vestnik vyzhshey shkoly, 1959, Nr 3, pp 24-25 (USSR)

ABSTRACT:

Industrial academies existed in the USSR until 1956. Their principal task was to raise the qualifications of the leading engineers of industry. Because of serious shortcomings they were liquidated and the Ministry of Higher Education was instructed to find a better system of training, leading to a higher level of education. As no steps have been made in this direction so far, the authors believe that industrial academies should be reestablished. The term of training must not exceed 1 year, and for some categories of students it may even be reduced to 3 or 4 months.

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Our Readers Suggest

The authors make suggestions on the methods of instruction and point out that in some cases a corresponding post-graduate studentship should be established for plant workers who have successfully graduated from the academy but reside in another town.

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007/25-76-0-107-1

AUTHOR: Merkulov, I.A. Deputy Chairman
TITLE: Prior to the Flight Into the Great Cosmos
PERIODICAL: Nauka i zhizn', 1959, Nr 3, pp 34 - 35 (USSR)

ABSTRACT: The author refers to the statement of N.S. Khrushchev that "scientists do not doubt that people can carry out interplanetary journeys in the near future" and reports on the results of the 2 geophysical rockets launched by the Soviets on 2 and 10 July 1959. The instruments inside the rocket sent up on 2 July (an intermediate range ballistic rocket) gave valuable data on the composition of light gases at great altitudes, on pressure density and temperature of the atmosphere at an altitude of some hundreds of km above the Earth's surface. In the upper atmospheric strata, rarefied gases move at hurricane speeds. Billions of micrometeorites - iron and stone dust particles - continuously penetrate from interplanetary

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007/25-50-1-15/61

Prior to the Flight Into the Great Cosmos

space into the upper atmospheric strata. Their quantity and energy, as well as the state of the ionosphere, were also investigated by means of apparatuses in the rocket. Very important data was obtained by measuring the ultraviolet radiation of the sun. Two dogs and a rabbit, placed in the rocket, endured well the great acceleration during the powered part of the trajectory and the state of weightlessness when the rocket coasted. The dog Otvazhnaya completed its first flight in a rocket. Thus it may be supposed that living beings can undergo a flight in a rocket without injury. The instruments in the rocket launched on 10 July 1957 (same type vehicle as above) measured the infrared radiation of the Earth and of the Earth's atmosphere, analyzed the ion and neutral composition of the atmosphere, and measured the electrostatic fields. The two dogs Otvazhnaya and Zhemchuzhnaya returned to Earth from this rocket in good condition. Following

Jan 2 5/3

7/1/59-1-15/59

Prior to the Flight Into the Great Cosmos

K.E. Tsiolkovskiy's idea of designing a rocket engine, Soviet scientists focused their attention on the problem of liquid fuel jet engines. They suggested using metal fuel which increases the heating effect of the reaction and transforming the metal tanks themselves into fuel when making flights to other planets. They also proposed that rockets use not only the combustion reaction, but also other exothermal reactions in particular the reaction of the combining of fuel with fluorine. However, rocket energetics alone will not determine the success of interplanetary flight, but also the external form of the rocket, the aerodynamic load on its body and the heat-resisting alloy. There is 1 photograph.

ASSOCIATION: Zakryiya "Astronavtika" Tsentral'nogo aerokluba USSR (Department "Astronautics" of the Central Aeroclub of the USSR).

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