Innovative Mechanical Engineering Technologies, Equipment and Materials 2013

IOP Conference Series: Materials Science and Engineering Volume 69

Kazan, Russia 25 – 27 September 2013

ISBN: 978-1-63439-880-0

ISSN: 1779/:;:3

Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© by the Institute of Physics All rights reserved.

Printed by Curran Associates, Inc. (2015)

For permission requests, please contact the Institute of Physics at the address below.

Institute of Physics Dirac House, Temple Back Bristol BS1 6BE UK

Phone: 44 1 17 929 7481 Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 USA Phone: 845-758-0400

Fax: 845-758-2634

Email: curran@proceedings.com Web: www.proceedings.com

TABLE OF CONTENTS

MODELING THE POLYMER PRODUCT MACERATION D N Ahunov, M N Karpova	1
MODERNIZATION OF CLAMPING UNIT OF DRAFT OF ENDOSURGICAL MONOPOLAR	4
FORCEPS	4
IMPROVING OF PERFORMANCE SYSTEM OF WARRANTY FOR AUTOMOTIVE	
ENGINEERING ABROAD ON THE BASIS OF DATA OF REJECTIONS ANALYSIS	0
I V Makarova, R G Habibullin, E I Belyaev, A S Safonov, A A Cheremin	9
MATHEMATICAL MODEL OF THE COMPONENT MIXTURE DISTRIBUTION IN THE	
MOLTEN CAST IRON DURING CENTRIFUGATION (SEDIMENTATION)	12
R A Bikulov, L M Kotlyar	13
NUMERICAL EXPERIMENT OPTIMIZATION TO OBTAIN THE CHARACTERISTICS OF THE	
CENTRIFUGAL PUMP STEPS PACKAGE	17
S V Boldyrev, A V Boldyrev	1 /
EXPERIMENTAL INSTALLATION TO STUDY THE INFLUENCE OF ACOUSTIC	
OSCILLATIONS ON THE CHARACTERISTICS OF A GLOW DISCHARGE	23
S A Fadeev, N F Kashapov, V M Larionov	23
DEVELOPMENT OF THE METHOD OF CREATION OF THE 3D MODEL OF TOPOLOGY OF	
THE SURFACE BY MEANS OF THE OPTICAL MICROSCOPE	27
R R Gaisin, A V Nikiforova, N F Kashapov, R N Kashapov	21
MINI-CENTRAL HEATING AND POWER PLANT (CHP): THE CHOICE OF THE OPTIMAL	
STRUCTURE AND MODES OF OPERATION	31
I R Gil'Manshin, I A Konahina, N F Kashapov, N N Fahreev	
HEIGHTENING OF EFFICIENCY FUEL USING INSTALLATIONS DUE TO EXTERNAL	
RECUPERATION UNITS OF WASTE HEAT.	35
I A Konahina, I R Gil'Manshin, T R Safin	
ENERGY SERVICE CONTRACTS IN REGIONAL ENGINEERING CENTER FOR SMALL AND	
MEDIUM BUSINESSES.	38
I R Gil'Manshin, N F Kashapov	
NOISE ABSORBING COMPOSITE MATERIALS APPLIED IN DOMESTIC TRUCKS	42
I F Gumerov, L N Shafigullin, S M Vakhitova, I F Shaekhova	
PHASED ARRAY BASED ULTRASOUND SCANNING SYSTEM DEVELOPMENT	46
R K Sagdiev, E S Denisov, Yu K Evdokimov, M G Fazlyyyakhmatov, N F Kashapov	
ACOUSTIC SENSING METHOD BASED ON THE INVERSE PROBLEM OF RECOVERING	
THE DENSITY PROFILE AND THE BULK MODULUS OF THE INHOMOGENEOUS MEDIUM	52
Yu K Evdokimov, B K Temyanov, M G Fazlyyyakhmatov	
BEAM CONTROL SYSTEM FOR ULTRASOUND SCANNING DEVICE	58
E S Denisov, B K Temyanov, R K Sagdiev, M G Fazlyyyakhmatov	
THE ANALYSIS OF THE BOTTOM ELECTRODE THERMAL STREAMS DURING WORK	
PROCESS IN A MELTING FURNACE	63
I K Israfilov, A T Galiakbarov, D I Israfilov	
APPLYING 3D-PRINTING TECHNOLOGY IN PLANNING OPERATIONS OF CANCER	
PATIENTS	68
L N Kashapov, A N Rudyk A N, R N Kashapov	
RESEARCH OF COBALT CHROMIUM ALLOY SURFACE MORPHOLOGY AFTER	
SANDBLASTING	72
L N Kashapov, N F Kashapov, R N Kashapov	
ENGINEERING AND BLUE-COLLAR OCCUPATIONS PRESTIGE IN THE MINDS OF	
INDUSTRIAL CITY STUDENTS (NABEREZHNIYE CHELNY CITY EXPERIENCE)	77
A T Kayumov, D N Mustafina	
SURFACE HARDENING OF COMPONENTS BY AUTOMATIC PLASMA ELECTROTHERMAL	
INSTALLATION WITH MOLTEN CATHODE	81
A A Khafizov, B Yu Shakirov, Yu I Shakirov	
COMPETITIVENESS ASSESSMENT OF ENGINEERING PRODUCTS	85
A R Kharisova, A S Puryaev	
AUTOMATION SYSTEM GOALS FOR THE CREATION AND OPERATION OF THE TOOL	88
R.M.Khisamutdinov, M.R.Khisamutdinov	

DIAGNOSIS OF CNC MACHINE TOOLS IN TERMS OF CIRCULAR INTERPOLATION'S	
ACCURACY FIGURE	92
R M Khusainov, S F Belov, O V Chukhontseva	
DEVELOPMENT OF THE INTELLECTUAL SYSTEM FOR PREDICTING THE PROPERTIES	0.6
OF COMPACTED GRAPHITE IRON	96
SYSTEM ANALYSIS OF THE ENERGY COMPLEX OF ENGINEERING ENTERPRISE AS A	
BASIC TOOL OF EFFECTIVE ENERGY MANAGEMENTBASIC TOOL OF EFFECTIVE ENERGY MANAGEMENT	00
N F Kashapov, I R Gil'Manshin, I A Konahina	99
OPTIMIZATION OF INDUSTRIAL STEAM SUPPLY AND STEAM-AND-CONDENSATE	
FARMING OF MACHINE BUILDING ENTERPRISE	101
I A Konahina, N F Kashapov, I R Gil'Manshin, R R Ganiev	101
THE METHOD OF MANUFACTURE OF NYLON DENTAL PARTIALLY REMOVABLE	
PROSTHESIS USING ADDITIVE TECHNOLOGIES	105
R N Kashapov, A I Korobkina, E V Platonov, G T Saleeva	
PROVIDING NORMAL CONDITIONS OF LUBRICATING OF DIESEL ENGINE DURING ITS	
OPERATION	109
A T Kulakov, A A Gafiyatullin, E P Barylnikova	
INNOVATIONS OF MODERN SYSTEM OF VOCATIONAL GUIDANCE IN TECHNICAL HIGH	
SCHOOL	117
T B Kurbatskaya, T I Bychkova	
AUTOMATIC CONTROL SYSTEM OF HIGH PRECISION WELDING OF WORKPIECES IN	
MECHANICAL ENGINEERING	121
IN Kuznetsov, V V Zvezdin, I H Israfilov, S M Portnov	
MAGNETRON DISCHARGE VOLT-AMPERE CHARACTERISTIC INVESTIGATION AT THIN	104
FILM COATING PROCESS	126
N F Kashapov, A G Luchkin, G S Luchkin	121
UNPOWERED STAND FOR TESTING OF CAR DIESEL ENGINE TURBOCHARGERS	131
MODIFIED CATIONIC MEMBRANES FOR WATER PURIFICATION, AND THEIR	
SELECTIVE PERMEABILITY	135
G V Mavrin, D D Fasullin, R G Melkolvan	133
PRACTICAL EXPERIENCE OF USING THERMAL-MASS FLOWMETERS AT THE	
REGISTRATION ASSOCIATED (FREE) PETROLEUM GAS	139
M G Fazlyyyakhmatov, N F Kashapov, Kh A Khayritonov, D K Lazarev, V K Lazarev	
CREATION OF ANISOTROPIC FRICTION CONDITIONS DURING THE PROCESS OF HOT	
FORGING	144
D L Pankratov, R I Valiev	
IMPROVEMENT OF THE COLD FORMING TECHNOLOGY OF THE PARTS SUCH AS	
LONGERON	148
L R Kashapova, D L Pankratov, A A Bilyalova	
APPLICATION OF THE DEVICE OF SLICES FOR AUTOMATION OF MATRIX	
CALCULATIONS	153
E A Romanovsky	
PULSE PLASMA SURFACE THERMOSTRENGTHENING OF MACHINE PARTS	157
I H Israfilov, A T Galiakbarov, D A Bashmakov, A T Gabdrahmanov, A D Samigullin	
QUANTUM-CHEMICAL CALCULATIONS OF THE STRUCTURE AND VIBRATION	1.61
SPECTRUM OF METHYL NITRATE	161
NEW APPROACH TO INVESTIGATING PLASMA PROCESSES OCCURRING IN FRICTION	
UNITS OF MACHINES AND MECHANISMS	165
S Sharifullin, N Rogozhkin	105
CONNECTION BETWEEN MACHINES DURABILITY DURING OPERATION AND THE	
COMPLEX OF PHYSIC-MECHANICAL PROPERTIES, FORMED DURING THE PRODUCTION	
OF CRITICAL PARTS	169
V G Shibakov, D L Pankratov, R V Shibakov	107
THE DETERMINING OF THE COEFFICIENT OF SAFETY OF BEARING ABILITY OF	
ANISOTROPIC BARS IN THE GENERAL CASE OF THEIR COMPLEX RESISTANCE	178
K E Sibgatullin, E S Sibgatullin	
MODULAR REPRESENTATION OF THE PRODUCT IN THE KNOWLEDGE BASE IN THE	
TECHNOLOGICAL PROCESS FORMATION	183
L A Simonova, E I Egorova	

CLEANING OF A SURFACE OF DETAILS IN PLASMA OF THE VOLUME CATEGORY	
BETWEEN SOLID AND LIQUID ELECTRODES	186
R I Valiev, B Yu Shakirov, Yu I Shakirov	
METHOD OF CALCULATING OF OPTIMAL GRADING MODES WITH REGARD TO	
FORMING OF GRINDING SURFACE ROUGHNESS	190
R R Ziyatdinov	
Author Index	