STUDY CASE - TAMPING TOOLS WITH THE REINFORCEMENT BY TUNGSTEN CARBIDE AT THE TINE

C. Besleaga[1], I.C. Popescu[2], R.M. Negriu[3], S.G. Badea[1]

[1] SC IMCF SA, Bucharest, ROMANIA, cristibesleaga@yahoo.com
[2] Polytechnic University, Bucharest, ROMANIA
[3] SC Econet Prod SRL, Bucharest, ROMANIA

An important operation in the technical process of building or maintenance of the railways is tamping. Tamping operation is made by different tamping machines, using tamping tools. Tamping tools are the most stress part of the tamping machine, being stress at bending, oscillations, abrasive wear, s.a. The main part of a tamping tool which influences in present the lastingness of this is the active part (tine). The research team proposes a study cases using CAD, a new composite material, with tungsten carbide, for the tine and there were made researches regarding the behavior in situ for the different tamping tools.

INTELLIGENT MECHATRONIC EQUIPMENT FOR VECTORIAL MASO - KINETOTHERAPY

T. S. Craciunoiu[1], V. Avramescu[2], I. Stoian[3], C. Dumitru[4], C. H. Orasanu[5], R. Grejdanescu[6], L. T. Paun[7] , T. M. Muntenu[8], O. Surdu[9], V. Mihailescu[10]

[1, 2, 3, 4, 5, 6, 7] SC ICTCM - Mechanical Engineering and Research Institute SA, Bucharest, Romania vavramescu@ictcm.ro, corasanu@ictcm.ro, groxana@ictcm.ro, lpaun@ictcm.ro
[8] SC Mecanica Ceahlau Piatra Neamt, Piatra Neamț, Romania, ceahlau@ceahlau.com
[9] Balnear Sanatorium and Recovery Techirghiol, Constanta, Romania, balneos2004@yahoo.com
[10] Professor Constantin Popovici Foundation, Bucharest, Romania, mmvalentin@gmail.com

The recovery proces of elderly or disabled person is a major problem with implications on the social environment and on the medical environment due to the complexity of treatment, its duration, standard equipment and specialized capable equipment. Intelligent mechatronic equipment for monitoring patients, persons with disabilities and the elderly have become an immediate necessity, the world providing a wide range of such systems, from simple to complex. Each person (more or less, sooner or later) needs to treat post recuperator, the mechatronics equipment (assisted adjustable bed) proposed to achieve through its multimunctionalit, is necessary, particularly in recovery sanatoriums (regardless of the conditions of patients) and in hospitals for postoperative situations. Important is that these mechatronic equipment with medical applications have integrated sensors and systems which gives them the special multifunctionalitaty and intelligence.

MULTIFUNCTIONAL SURGICAL TABLE

T. S. Crăciunoiu[1], V. Avramescu[2], A. V. Ciurea[3], C.M. Birtu[4], A.M. Croitoru[5], V.T. Grigorean[6], I. Lung[7], R.S. Crăciunoiu[8], L.T. Păun[9], R. Grejdănescu[10]

[1, 2,4,5,8,9,10] SC ICTCM - Mechanical Engineering and Research Institute SA Bucharest, Romania
e-mail: vavramescu@ictcm.ro, cbirtu@ictcm.ro, aconstantinesc@ictcm.ro, rcraciunoiu@ictcm.ro, lpaun@ictcm.ro, groxana@ictcm.ro
[3] Bagdasar-Arseni Clinic Emergency Hospital, Bucharest, Romania, grigorean.valentin@yahoo.com
[7] The National Institute of R-D in Mechatronichs and Measurement Technique – INCDMTM, cefin@cefin.ro

One of the surgical system priorities is the need to ensure the patient safety and creating the optimal conditions of the operator, for example: the need to adopt some various positions of the patient or the need to change the intraoperator position of the patient. There are better surgical tables, made by several segments that can be operated independently. Also is developing a wide range of intelligent devices and accessories to allow expansion of the medical act, ensuring precision, maneuverability, accuracy, patient safety, patient and operator comfort. A particular case is the development of mechatronic equipment in medical applications, such as mechatronic systems for vectorial maso- kinetotherapy recovery treatments. The importance of this is that these mechatronic devices with medical applications have integrated sensors and special systems which gives them the multifunctionality and intelligence.

SYSTEM FOR DATA AQUISITION AND ANALYSIS OF THE KINEMATICS OF THE GAIT FOR THE COMAND OF A ROBOTIZED ORTHOTIC SUIT

F. Alexiuc[1], V. Avramescu[2], G. Onose[3], L.T. Paun[4], R. M. Nita[5], C.H. Orasanu[6], R. Grejdanescu[7], C. N. Nicolau[8], A. M. Croitoru[9], R. S. Craciunoiu[10]

[1, 2, 4, 5, 6, 7, 8, 9, 10] SC ICTCM - Mechanical Engineering And Research Institute SA, Bucharest, Romania
falexiuc@ictcm.ro, vavramescu@ictcm.ro, lpaun@ictcm.ro, raluca@ictcm.ro, corasanu@ictcm.ro, groxana@ictcm.ro, cnicolau@ictcm.ro, aconstantinescu@ictcm.ro, rcraciunoiu@ictcm.ro
[3] Bagdasar-Arseni Clinic Emergency Hospital, Bucharest, Romania, geluonose@clicknet.ro

The researches which were made in the project "Informatics system based on data acquisition and advanced decision in real time methods for the command and control of an robotized orthotic suit in order to assist the persons with locomotors disabilities", follow the achievement of a software for the data acquisition, in real time, and also the decisions making for keeping the orthostatism and the equilibrium. The project was developed by a consortium formed by SC ICTCM SA, Bagdasar-Arseni Clinic Emergency Hospital, UPB-CTANM, SC Neuron SRL and Tehnicom 3D-ING SRL. In the first stage of the project there were achieved the data related to motion: the acquisition of the analogical signals provided by the potentiometers displaced in the robotized orthotic suit's joints and the acquisition of the signals provided by the pressure sensors displaced on the base of the foot. The data acquisition system can be used in the kinetotheraphy clinics in order to evaluate and medical recovery of the patients. In the second stage there is considered the simulation of the behaviour of the robotized orthotic suit in the virtual medium in order to study the behaviour of the orthotic suit and of the human subject in order to find the hardware and software elements which should assure the safety development of the ascension/descent movements, orthostatism, gait and equilibrium, reaction to the perturbing factors, etc.

INTEGRATED CONCEPTUAL MODEL OF A WHEELCHAIR, MADE BY THE DEVELOPMENT OF SOME COMPONENTS THAT ARE PART OF ITS STRUCTURE

$\boxed{\text{Grigore Stanca}^1}$, C.Dumitru[2], C.H. Orasanu[3], V. Avramescu[4], G. Onose[5] , L. Paun[6] , R. Grejdanescu[7] , R.M. Nita[8] , R.S. Craciunoiu[9] , I. Dimache[10]

[1,2,3,4,6,7,8,9,10] SC ICTCM - Mechanical Engineering and Research Institute SA,Bucharest, Romania
vavramescu@ictcm.ro, corasanu@ictcm.ro, lpaun@ictcm.ro, groxana@ictcm.ro, raluca@ictcm.ro, rcraciunoiu@ictcm.ro, idimache@ictcm.ro
[5] Bagdasar-Arseni Clinic Emergency Hospital, Bucharest, Romania, geluonose@clicknet.ro

The researches made in this project had as main objective the conceptual development of some integrated, complex, competitive models of complex equipments which to carry out the problems of the persons with a high degree of disabilitation for reducing their psychological impact and for their socio-economic integration, in general by offering them a means of independent transportation and the realization of the experimental models of some wheel chairs, that are hand power or electric power, with modular and flexible structures, with a high degree of flexibility. Based on the conceptual models can be developed in the future a wide range of similar equipments, with simple or complex functions, hand power or driven by other means, fix, foldable, with special accessories, with flexibility possibilities according to the disabilitation degree, for offering safety to the persons with neuro-kinetic deficiencies.

MODERN METHODS FOR THE STUDY OF NANOCOMPOSITES

Carmen Răducanu, Gabriela Diacov, Dumitru Bucă, Roxana Neagu, Mihaela Hrişcu

SC ICTCM Institutul de Cercetare si Proiectare Tehnologica pentru Constructia de Masini SA
Bucuresti, ROMANIA
E-mail: carmen_radu88@yahoo.com

The paper offers the most recent information on high resolution microscopic systems. There have been studied several methods concerning the visualization of the structure of electrodeposisits nanocomposites: TEM (Transmision Electron Microscope), SEM (Scanning Electron Microscope), AFM- (Atomic Force Microscope), STM (Scanning Tunelling Microscope). Toghether with basic technical data, the paper also presents typical images for the involved studying methods.

THEORETICAL CONSIDERATION REGARDING THE DYNAMIC BEHAVIOUR OF A MODULAR SYSTEM FOR THE MILLING PROCESS

Raluca Magdalena Nita[1], Nicoleta Rachieru[2]

[1]University Politechnica of Bucharest, SC ICTCM SA,
e-mail ralu_magda@yahoo.com
[2] SC ALPLAST CONF SRL,
e-mail nrachieru@yahoo.com

The papers aims to study with the finite elements method the dinamic behaviour of a modular system for clamping the pieces during the cutting process, through the determination of the characteristic frequency where performance, reliability, durability and reliability in function represents the fundamental characteristics have great influence on the final results of processing process.

STUDY OF A EHD POCKET JOURNAL BEARING

Monica Crudu *, Sorin Cananau, Mohamad Hajjam*****

*University "POLITEHNICA" Bucharest, ROMANIA,
e-mail: crudumonica@yahoo.com
**University "POLITEHNICA" Bucharest,
ROMANIA, e-mail: s_cananau@yahoo.com
*** Solid Mechanics Laboratory of Poitiers University,
FRANCE

This paper deals with the textured surfaces effects of a journal bearing working in elastohydrodynamic regime. The fact that texture surfaces increase the carrying capacity and decrease the friction losses in the applications concerning the bearings, mechanical face seals and piston-cylinder couple, it's already known. In the elastohydrodynamic lubrication regime the increase of the maximal pressure and film thickness is more accentuate that in the hydrodynamic regime because we take into account the elastic behavior of the materials. The main goal of this study is to determine the optimal pocket texture geometry, which gives the largest carrying capacity and the smallest power dissipation by geometrical modeling.

STUDY OF A HD POCKET JOURNAL BEARING

Monica Crudu*,Sorin Cănănău, Aurelian Fătu*****

*University "POLITEHNICA" Bucharest, ROMANIA,
e-mail: crudumonica@yahoo.com
**University "POLITEHNICA" Bucharest,
ROMANIA, e-mail: s_cananau@yahoo.com
*** Solid Mechanics Laboratory of Poitiers University,
FRANCE

More and more studies have revealed an increase of the carrying capacity and a decrease of friction losses due to the positive effects of surface texturing concerning the field of bearings, mechanical face seals and piston-cylinder couple. Also it is well known that pocket texture amplifies this effect for hydrodynamic journal bearing more than partial texture [1]. Based on this hypothesis, this paper represents a first step in studying the texturing effects on hydrodynamic journal bearing by assessing the performances of a pocket journal bearing. The main asset of this study is to determine the optimal geometry, which gives the largest carrying capacity zone and the smallest power dissipation by geometrical modeling the three dimensions of the pocket: width, circumferential length and depth of the pocket.

SLIP/NO-SLIP INFLUENCE ON THE BEHAVIOR OF A RADIAL BEARING WITH A STATIC LOAD. HD ANALYZES

Daniela Coblaş *, Aurelian Fătu, Alexandru Rădulescu*****

* University of Polytechnics, Bucharest, ROMANIA,
e-mail: daniela.coblas@yahoo.com
** Solid Mechanics Laboratory of Poitiers University,
FRANCE, e-mail: aurelian.fatu@univ-poitiers.fr
*** University of Polytechnics, Bucharest, ROMANIA,
e-mail: sandu@meca.omtr.pub.ro

This paper aims to examine the influence of wall slip on HD lubrication performance of a journal bearing. The study follows two main directions: first to increase fluid film thickness to obtain a greater load capacity and second to reduce power loss. By numerical modelling, we had modified the geometric parameters of a slip surface placed on the sleeve bearing. Results show that for a well chosen surface geometry it is possible to improve the bearing performances.

SLIP/NO-SLIP INFLUENCE ON THE BEHAVIOR OF A RADIAL BEARING WITH A STATIC LOAD. EHD ANALYZES

Daniela Coblaş *, Mohamed Hajjam, Alexandru Rădulescu*****

* University of Polytechnics, Bucharest, ROMANIA, e-mail: daniela.coblas@yahoo.com
** Solid Mechanics Laboratory of Poitiers University, FRANCE, e-mail: mohamed.hajjam@univ-poitiers.fr
*** University of Polytechnics, Bucharest, ROMANIA, e-mail: sandu@meca.omtr.pub.ro

In this paper we present a study on the behavior of a steady-state radial bearing assuming the existence of slip phenomenon at the fluid-solid interface with the sleeve bearing wall. The bearing operates in elasto-hydordynamic lubrication regime, disconsidering thermal influence, and taking into account the general assumptions considered for determining Navier-Stokes equation for the general hydrodynamic lubrication case. Like presented in the previous article, the computation was possible by using numerical modeling software Accel, available thanks to LMS Laboratory, belonging to Poitiers University. Only by using this software, the available time we had was sufficient to perform this study.

THEORETICAL RESEARCHES REGARDING THE STATIC BEHAVIOUR OF A TRANSVERSAL SLIDE FOR MULTIFUNCTIONAL MACHINE TOOLS

Raluca Magdalena Nita, Loredana Paun, Roxana Grejdanescu

SC ICTCM SA, Bucharest, ROMANIA, e-mail ralu_magda@yahoo.com

The paper aims to study with the finite elements method the static behavior of transversal slide, component of a multifunctional machine tool, under the function during processing, in the conditions of steel and a composite slide. It's very important to determine the performance, resistance and security in functioning because this represent fundamental characteristics on the final results of the processing process.

EXPERIMENTAL RESEARCHES ON THE THERMAL BEHAVIOR OF USED LUBRICANTS

Alexandru V. Rădulescu[1], Irina Rădulescu[2]

[1] Université POLITEHNICA de Bucarest, Bucarest, ROUMANIE, e-mail : sandu@meca.omtr.pub.ro
[2] S.C. I.C.T.C.M. S.A. Institut de Recherches Technologiques pour la Construction des Machines, Bucarest, Roumanie, e-mail : irena_sandu@yahoo.com

This article proposes to study the thermal behavior of fresh and used lubricants, taking account to the variation of viscosity versus temperature. The proposed rheological model for fresh and used lubricants is the Newton model, where the shearing stresses in the fluid are proportional to the velocity gradient. Information on the viscosity of lubricants can be regarded as a "window" to analyze other fluids properties. The viscosity is always easier to measure than many other properties of lubricants, providing a very important tool for the fluids characterization.

ASPECTS CONCERNING THE OPTIMIZED DESIGN OF AN ARTICULATED ARM TYPE STRUCTURAL ELEMENT OF A RRR ROBOT

Adrian Ghiorghe

Politehnica University of Bucharest, ROMANIA,Faculty of Engineering and Management of Technological Systems
e-mail : adrian.ghiorghe@yahoo.com

Optimization of structural elements of industrial robots is essential in modern design optimized by finite element simulation and obtain a modification of the structure with maximum rigidity. By applying structural and topology optimization algorithm was intended to determine optimal values for design variables in terms of reducing material in the structure of the robot. Structural optimization is to achieve MEF parameterized geometrical model of the assembly robot, by considering some geometric sizes as design variables, imposing restrictive conditions on the model and establish an objective function to optimize. The runs of the FEM analysis, are different values of design variables and state variables are processed, to determine the feasibility set of design variables in order to determine an optimal set (minimum) in terms of objective function.

INNOVATION IN THE COMPLEX PRODUCTION SYSTEMS

Radu Popescu

INCE - CEIS, ROMANIA,
radupopescuceis@yahoo.com

The paper analyses the proces of inovation in the field of Product Complex Systems (PCS).These systems have a high content of knowledge and an important place in the Knowledge Economy. Interaction between product and process inovation has similarities with the interaction between mechanical parts and that of firm architecture.

SUPPORTING ON EXTERNAL LINKS TO PROMOTE INNOVATION

Radu Popescu

INCE - CEIS, ROMANIA,
radupopescuceis@yahoo.com

External results assesment is a necesity requested, by the speed of technological changes. Companies have to balance between two options: To maintain the necessary competencies in order to build Product Complex Systems and to prevent the lack of concentration and specialisation when the technological model changes.

CLASSICS FOR THE EXCELLENCE ACHIEVING

Radu Popescu [*], Emilia Stănescu [**]

* INCE - CEIS, ROMANIA,
radupopescuceis@yahoo.com
** INIMM, Bucureşti, ROMANIA, e-mail:
emilia@inimm.ro

The behaviour of excellent firms, companies able to obtain important achievements is characterised by inconventional activities (details separate the average firms of the excellent ones). Amoungh them we can observe: to meet the clients needs, involvement of highly qualified specialists, enthusiasms firms activities, high level quality assurance.

EXCELLENCE AND SUSTAINABILITY OF ENTERPRISES

Radu Popescu [*], Rareş Dima [**]

* INCE - CEIS, ROMANIA,
radupopescuceis@yahoo.com
** INIMM, Bucureşti, ROMANIA,
e-mail: inimm@inimm.ro

The evolution of global thinking in business, especially strategic thinking on company business, company or industrial firms, is a gradual sedimentation process of accumulated knowledge. The main objective of the company's concern is improving the situation at the time of the analysis and achievement of excellence in the future.