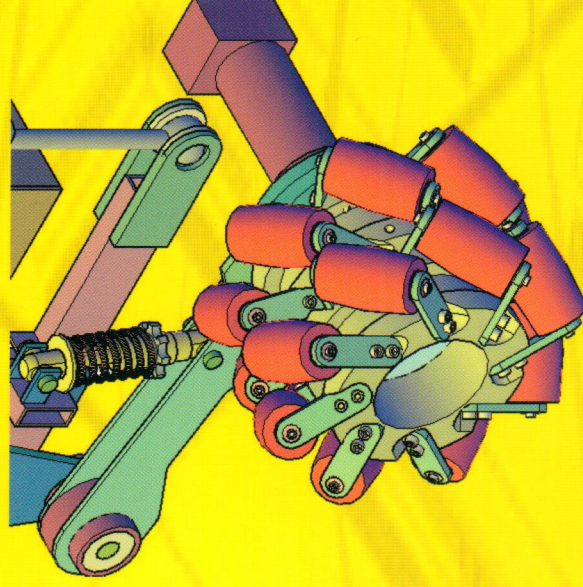


Advanced Concepts in Mechanical Engineering I



Edited by
Ioan Doroftei, Cezar Oprisan and Aristotel Popescu

Editors:

Publishing Editor: **Thomas Wohlbier**, 105 Springdale Lane, Millersville,
PA 17551, USA, t.wohlbier@ttp.net

Xi Peng Xu, Huqiao University, Ministry of Education Engineering Research Center for
Brittle Materials Machining, Xiamen, 361021, China, xpxu@hqu.edu.cn

Aims and Scope:

Applied Mechanics and Materials is a book series specialized in the rapid publication of
proceedings of international conferences, workshops and symposia as well as state-of-the-
art volumes on topics of current interest in all areas of mechanics and topics related to
materials science.

Internet:

The periodical is available in full text via www.scientific.net

Subscription Information:

Irregular; approx. 80-100 volumes per year. First volume in 2014: Vol. 440

The subscription rate for web access is EUR 1089.00 per year.

Standing order price for print copies: 20% discount off list price plus postage charges.

ISSN print 1660-9336 ISSN cd 1660-9336 ISSN web 1662-7482

Edited by
Ioan Dorănel
Cezar Oprisan
Aristotel Popescu

Leonid Tartakovsky (Israel)
George Tsilingiridis (Greece)
Andrei Tudor (Romania)
Kristina Uzuncanu (Romania)
Ion Visa (Romania)
Christos Vlachokostas (Greece)
Gheorghe Voicu (Romania)

Organizing Committee

Ioan Doroftei - Chair (Romania)
Aristotel Popescu - Chair (Romania)
Mihaela Rodica Balan (Romania)
Gelu Ianus (Romania)
Gheorghe Prisacaru (Romania)
Cristel Stirbu (Romania)
Dumitru Leohechi (Romania)
Marian Mares (Romania)
Eugen Golgotiu (Romania)
Gabriel Ursescu (Romania)
Vlad Mario Homutescu (Romania)
Marius Atanasiu (Romania)
Ioan Balsan (Romania)
Marian Pantiruc (Romania)
Tudor Stanciu (Romania)

Table of Contents

Preface

Committees

Chapter 1: Design and Research of Mechanisms and Machines

Assessment of Systems for Carrying out of Planar Biaxial Tensile Test

L. Andrusca, I. Doroftei, P.D. Barsanescu and V. Goanta 3

Compounding of Concurrent Rotation Movements

O. Antonescu, I. Popescu and P. Antonescu 9

The Influence of the Pinion-Shaft Deflection on the Dynamic Characteristics of

Helical Gear Pairs

V. Atanasiu, C. Oprisan and D. Leohechi 17

Optimization Design for Car Suspension Elastic Elements

C. Bujoreanu and C. Stirbu 23

Consideration Regarding the Inverse Kinematics of a Rowing Skiff under the

Action of the Oars Movement

M. Chirazi, E. Budescu and E. Merticaru 29

Chain Tracking System for Solar Thermal Collector

D. Ciobanu, C. Jaliu and R. Saulescu 35

Algorithms for Noncircular Gear Pitch Curves Generation

B. Cristescu, A. Cristescu and L. Andrei 41

Singularities Classification for Structural Groups of Dyad Type

C. Duca and F. Buium 47

Transmission Indices Adoption for 6R Structural Group

C. Duca and F. Buium 55

Naval Centrifugal Compressor Design Using CAD Solutions

C. Dumitrache, I. Calimanescu and C. Comandar 59

Naval Standard Safety Valve Design Using CAD Solutions

C. Dumitrache, I. Calimanescu and C. Comandar 65

Mechanical Characteristics of Electronic Printed Circuit Obtained by the Vapour

Phase Soldering Process

G.I. Dumitru, A. Tudor, G. Chisuiu and I. Plotog 71

Evaluation of Loss of Mass due to Corrosion Using Vibration-Based Methods

G.R. Gillich, Z.I. Praisach, H. Furdut, J.L. Ntakpe and A.A. Minda 77

Simulation of the Tooth Helix Angle Influence on the Vibration of a Single Stage

Helical Gearbox

Z.I. Korka, V. Cojocaru and C.O. Miclosina 83

Some Aspects Regarding the Mathematical Modeling and Dynamic Simulation of a

Single Stage Helical Gearbox

Z.I. Korka, C.O. Miclosina and V. Cojocaru 89

On the Synthesis of a Five Bar Linkage for Linear Trajectory Using a CAD Analysis C.E. Moldovan and C. Stăciaru	95
Low Speed Linear Actuator for Accurate Orientation of Concentrated Solar Convertors M. Neagoe, R. Saulescu, O. Munteanu and B. Burduhos	99
On a New Parallel Tracking System for Accurate Orientation of Concentrated Solar Convertors M. Neagoe, I. Visa, N. Cretescu and M. Moldovan	105
Geometrico-Static Modeling and Simulation of the Contact between Chain and Guide of a Reference Transmission R. Papuc, R. Velicu, M.T. Lates and C. Jaliu	111
Contribution on the Optimization of the Spur Gears Design Process Using Software Application G. Plesu and S. Cazan	117
Graphic Method Profiling of the End Mill Cutter Generating the Screw Compressor Rotor C.L. Popa and V. Popa	123
ZPA Worms – Definition and Technology A. Pozdirca	129
Planetary Gear for Counter-Rotating Wind Turbines R. Saulescu, C. Jaliu, O. Munteanu and O. Climescu	135
Virtual Model to Generate Motions on Cyclic Trajectories M.B. Tataru, A. Rus and C. Bungau	141
Dynamic Optimization of a Single-Seater Car Suspension System V. Totu and C. Alexandru	147
Structural Synthesis of Parallel Linkages by Multibody Systems Method I. Visa, M. Neagoe, M. Moldovan and M. Comsit	153
Chapter 2: Mechanics of Deformable Bodies	
Some Consideration Regarding the Models for Collisions with Plastic Indentation S. Alaci, F.C. Ciomei and C. Filote	161
Optimizing the Shape and Size of Cruciform Specimens Used for Biaxial Tensile Test L. Andrusca, V. Goanta and P.D. Barsanescu	167
V-Beam Thermal Actuator's Performance Analysis Using Digital Image Correlation R. Chioresan, M.C. Dutescu, M. Pustan and M. Hărdău	173
Fatigue Analysis of Large Diameter Threaded Connections Subjected to Dynamic Axial Loads V. Cojocaru, C.O. Miclosina and Z.I. Korka	177
Stress Analysis and Optimal Design of the Housing of a Two-Stage Gear Reducer V. Cojocaru, C.O. Miclosina and Z.I. Korka	177

Experimental Analysis Regarding the Degree of Plastic Deformation of Fracture Surfaces under da/dN, K_{IC} and J_{IC} Determination V. Goanta	
The Influence of the Fatigue Cycles Number on Material Hardness V. Goanta	
Influence of Several Parameters on Simulating the Ballistic Impact on a Homogeneous Plate C. Pirvu, S. Badea and L. Deleanu	
An Analytical Solution for Three-Dimensional Elliptical Elastic-Plastic Rolling Contact C. Popescu	
Residual Stresses in Cylindrical Roller Bearings – A Three-Dimensional Analysis Model C. Popescu	
Design of Experimental Test Bench for Determining the Stresses and Strains State of Guitar Neck M.D. Stancu, I. Curtu and D. Mihalache	
Mechanical Behavior of Guitar Neck under Simple Bending Stress Analyzed with Finite Elements Method M.D. Stancu, I. Curtu and T. Mocanu	
Chapter 3: Structural Engineering	
Deployable Structures for Architectural Applications - A Short Review I. Doroftei and I.A. Doroftei	
Optimal Configuration of Fluid Viscoelastic Seismic Dampers on a Ten Stories Building Using Finite Elements Method A. Ionescu, M. Negru and C. Burada	
Influence of Non-Linear Properties of Fluid Viscoelastic Properties on Seismic Damping Properties of a Ten Stories Building Using ANSYS Program A. Ionescu, M. Negru and C. Burada	
Experimental Determinations and Comparative Studies of the Stiffness for Some Sandwich Bars Reinforced with Metal Fabric C.M. Mirlitu, M.M. Stancescu, D. Boleu, A. Stanimir and I. Manea	
Experimental Determinations of the Eigenmodes for Sandwich Bars with Different Core Reinforced with Metal Fabric C.M. Mirlitu, D. Boleu, M.M. Stancescu and V. Rosca	
Vibration-Based Crack Detection in L-Frames J.L. Nolasco, G.R. Gillich, F. Muntean, Z.I. Pralsach and P. Lorenz	