

CZESTOCHOWA UNIVERSITY OF TECHNOLOGY

MODELLING OF ELEMENTS OF MACHINERY DRIVING UNITS

Monograph



SCIENTIFIC EDITORS

Adam Idzikowski

Piotr Sokolski

Czestochowa 2016

Czestochowa University of Technology
Faculty of Management

MODELLING OF ELEMENTS OF MACHINERY DRIVING UNITS

MONOGRAPH

SCIENTIFIC EDITORS

Adam IDZIKOWSKI

Piotr SOKOLSKI



Publishing Office
of Faculty of Management
Czestochowa University of Technology

Częstochowa 2016

Reviewers:

Prof. dr hab. inż. Franciszek W. Przystupa
Prof. dr hab. inż. Zbigniew Kłos
dr hab. inż. Andrzej Tomporowski, prof. UTP

Scientific editors:

Dr inż. Adam Idzikowski
Dr inż. Piotr Sokolski

Technical editor

Marcin Pilarski

Cover design

Dr inż. Joanna Cyganiuk

Authors:

- Chapter 1 Joanna CYGANIUK, Adam IDZIKOWSKI
- Chapter 2 Adam IDZIKOWSKI, Joanna CYGANIUK
- Chapter 3 Justyna ZIÓŁKOWSKA, Piotr SOKOLSKI
- Chapter 4 Agnieszka PUSTUŁKA
- Chapter 5 Justyna ZIÓŁKOWSKA, Piotr SOKOLSKI
- Chapter 6 Piotr STRYCZEK, Michał BANASZ
- Chapter 7 Krzysztof BIERNACKI
- Chapter 8 Marek SOKOLSKI
- Chapter 9 Maciej KUJAWA
- Chapter 10 Joanna CYGANIUK
- Chapter 11 Józef FLIZIKOWSKI, Grzegorz SZALA, Józef SADKIEWICZ,
Weronika KRUSZELNICKA
- Chapter 12 Józef FLIZIKOWSKI, Grzegorz SZALA, Józef SADKIEWICZ,
Weronika KRUSZELNICKA

ISBN 978-83-65179-73-9

© Copyright by Wydawnictwo Wydziału Zarządzania
Politechniki Częstochowskiej
Częstochowa 2016

Wydawnictwo Wydziału Zarządzania Politechniki Częstochowskiej
42-200 Częstochowa, al. Armii Krajowej 36 B
tel. 34 325 04 80, dystrybucja 34 325 08 67
e-mail: wyd.wz@zim.pcz.pl

Table of Contents

Introduction	5
<i>Chapter 1</i>	
Modelling of Hydraulic Drive Systems Used in Presses for Metal Forming	7
<i>Chapter 2</i>	
The Application of the Laws of Mathematical Logic in the Process of Modelling and Design of the Diagnoser of Brake Mechanisms	23
<i>Chapter 3</i>	
Designing of Parts of Basket Lifts Using Numerical Simulations	40
<i>Chapter 4</i>	
Modelling of Conveyor Belt Dynamics Diagnostically Modified	53
<i>Chapter 5</i>	
Analysis of Failures of a Feeder Operated in a Mine	65
<i>Chapter 6</i>	
Optical Method of Measurements of Deformations in Hydraulic Elements Made of Plastics	74
<i>Chapter 7</i>	
Modelling of Plastic Elements for Hydraulic Gerotor Machines	86
<i>Chapter 8</i>	
Modelling of the Driving Process of the Percussion Piston of the Hydraulic Hammer	107

Chapter 9

Power Systems for Aerial Drones and their Computer-Aided Analysis 117

Chapter 10Modelling of Pneumatic Drive Systems Used in Technological
Auxiliary Appliances 137**Chapter 11**Innovation and Wheat Corn Mill Process Control – Part I: Theoretical
Basis Knowledge 150**Chapter 12**

Innovation and Wheat Corn Mill Process Control – Part II: Research 162

Conclusion 179**Note on the authors** 180